Term and Campus: Winter 2017, DePaul Loop Campus
Dates: Thursdays, Jan. 5 through Mar. 16, 2017. Note: Eleven class meetings, includes Exam Week.
Class Time: 5:45 – 9:00 p.m. Room: TBA

Faculty: Eric Thor, 5504 N. Sawyer Ave., Chicago, Illinois 60625
Phone: Home 773-588-0482. Telephone is the best way to contact me. Cell # to be given in class.
E-mail: ethor@depaul.edu

Office Hours: Class days before or after class, also via phone or appointment.

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 math problems that someone else presents to us, but also to consider and discuss life situations, sometimes asking, then solving, our own questions. We seek to communicate clearly while using math to understand (and possibly influence) our world.

Text and Materials: Prices approximate.
REQUIRED:
These TWO items are sold new, packed together in a shrink-wrapped set, for $134.
NOTE: BUY THIS SET, NOT INDIVIDUAL ITEMS: Confirm the “Plus” version!
   a. Save money by buying the shrink-wrapped set. New website access kit alone is $126.
   b. Buy at DePaul Barnes & Noble bookstore, 1 E. Jackson in Loop. Not found elsewhere.
   c. If in doubt, contact Eric Thor before buying, or call Loop bookstore at 312-362-8795.
4. Scientific calculator. A two-line display is best, such as the TI-30XIIS, $20.

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 later 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 work as your own. Do the problems yourself.”
• Show lots of work, both to clarify your own thought processes and to inform your readers.
• Goal: Be able to explain a situation, what you did with it, and why you believe in your result.
Work and Assessment: What to expect.

Eleven class meetings. Regular use of websites (Pearson’s MyMathLab in MyLabsPlus, etc.). Weekly text homework assignments and in-class ‘quiz’ activities. Midterm test and cumulative final exam. Your term grade will be based on the following weighted factors:

30% Class attendance and participation. Be there, and be active.
40% Use of internet resources, especially Pearson’s MyLabsPlus. This is your main job.
10% Text homework completion. Turn in work when due; you can improve it later.
10% Class ‘quizzes’ & midterm participation. Participation outweighs scores on these activities.
10% Final exam score. Create your own ‘Open Notes Help Sheet’ to use whenever you wish.

The grading scale will be:

90-100% = A
80-89% = B
70-79% = C
60-69% = D
0-59% = F

By default, course is graded A, B, C, D, or F. You may request Pass/Fail grading, deadline Oct. 20th. In Pass/Fail grading, “C” or better (70% or better) is needed to pass and earn a “PA” grade, which would not affect your GPA. However, a Pass/Fail “F” would affect GPA, just as any other “F” would.

To be eligible for an Incomplete (“IN”) grade, you must already be passing the course at “C” or above.

For Extra Help:

- Communicate with other students using our voluntary phone & email contact list.
- Organize or join a study group.
- Join us 30 minutes early on class days for voluntary tutoring and problem-solving.
- Call me with questions 9 a.m. til 10 p.m. I am a good telephone tutor; try me and see.
- Work with a tutor. Look or ask, and you’ll find there are many options.
- Use Pearson MML+, DePaul D2L, Khan Academy, Physics4Kids, and other websites for help.
- Acquire auxiliary math books or laminates. Start with your public library and DePaul’s libraries.
- Be kind to yourself: take a break; take a walk; take a nap. Good 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.”
- Fear can motivate for a while, but mostly it interferes with learning and performance.

Description of Quantitative Reasoning Course:

Our course can help you prepare for other college courses, function effectively in a career, and use ‘critical thinking’ to handle issues of daily life. Our text authors say, “…look at mathematics in three ways: as the sum of its branches, as a way to model the world, and as a language.” I see math as a big collection of useful multi-purpose tools, and a great way to think and communicate clearly. “But,” you might ask, “why choose these particular chapters and topics for our brief DePaul SNL course?”

Arithmetic and its abstracted cousin, algebra, provide basic ground rules and common language for quantitative discussions. Arising from nature itself, they have been organized and extended by human effort over thousands of years. They give us the words and grammar we need to move beyond English and become functionally literate in ‘Math-speak.’

Logic, critical thinking, and financial management skills help us choose and sail our own life courses, instead of being buffeted by storms of confusion or deception.

Statistics and data analysis are crucial in our society and its technologies. Collecting, processing, and using information affects our lives, more often than we may realize. 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.’

My goal is that each student be ready for life-long use and learning of mathematics at some personally appropriate level. I expect you to participate and improve, not to be or become perfect.
Your Learning Experience: Hints for success with math.

You already have a foundation. We’ll build on it. Many math words are also used in everyday English, usually with related meanings. You probably know more about math and use it more often than you realize. Watch for connections between previous knowledge and the curriculum of this course. While moving ahead, use your past; don’t leave it behind.

Be an efficient learner. Find and remember the general essence of material, and apply it when appropriate. For example, I’ll teach you a simple 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 get the most value from the activity. With a ‘big-picture’ understanding of all situations that involve roots, and all such algorithms, you’ll have new power to open many doors.

Do you experience math anxiety? Ever suffer like the man in “Hell’s library”? (Ask me about the cartoon.) If so, don’t give up. Even more important, don’t stagger under unreasonable self-imposed expectations, labeling yourself as incompetent or incapable. Surprise! You’re not supposed to move directly and confidently to every problem’s solution! Let yourself enjoy a good puzzle.

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, make sure you understand the story. Realize that unstated assumptions, deliberate or unintended ambiguities, even outright errors, could all misdirect you. A chosen road may lead you to a dead-end. If so, don’t quit. 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, you can translate the same material between different formats (e.g. numerical, symbolic, physical, geometric, pictorial, chart, or word problem versions). Skills or insights from one system may help you understand and function in other systems. When you find your own path through the wilderness, math can be fun and exciting!


Use memory aids, because memory fades. Don’t pretend to have the proverbial photographic memory. Do build, and use, a tool kit of mnemonics (memory aids). Take notes, use acronyms or other reminder cues, and learn how to re-create that which was known but has been 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. Some suggestions:

Try to sit down and work on this course for at least one hour every day. 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. Keep your scratch papers and keep a useful note-book.

Focus on the stories, more than on the numbers. As one poet said, “The universe is made of stories, not atoms.” Don’t start doing arithmetic too soon. First, be sure that you really understand the story. What is known? What are the constraints? What is sought? Second, devise a plan. Third, carry out your plan. Fourth, look back and check. (See George Polya, “How To Solve It.”)

Exercise your mind 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 whenever in doubt. Reading, listening, or watching are all valuable. Sharing, talking, and doing are priceless. Give your mind a well-rounded workout in several venues every week. Your confidence and abilities will grow as you expand your ‘circle of comfort.’

Think, 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:** See page 5 of this syllabus for “Schedule of Topics.” Don’t fall behind!

Short text assignments will be given weekly during the term. Turn in paper copies of them.

Online assignments, keyed to weekly Topics, are pre-loaded on the Pearson website.

**How to get started in the course:**

Read Custom Text Chapter One “Approaches to Problem Solving,” also the “Chapter Summary” for that chapter. This will introduce you to the layout of the text and to the material on problem-solving methods. If time permits, do “Quick Quiz” questions 1-10 in each unit of the chapter. Explain your answers. (Look in text to find answers and solution methods for chapter exercises. Use them for checking and guidance, but please, don’t just copy them!)

Browse in “Barron’s Mathematics Study Dictionary.” Page references are chosen to enhance understanding of each week’s topics. Please check those pages regularly, plus any others that interest you. There are no actual assignments from the dictionary.

Many excellent resource books could boost your mastery and enjoyment of quantitative material. Try a library or bookstore. I love “Adam Spencer’s Book of Numbers” by Adam Spencer.

**Your Instructor: Eric Thor**

I believe strongly in lifelong learning and teaching. Since 1975, I’ve taught mathematics in Chicago high schools and other situations. I’ve also taught sailing and 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 enjoy reading, both fiction and non-fiction, especially on historical, psychological, and science topics. I enjoy television – favorites include Turner Classic Movies, Public Television, Book TV and American History TV (on C-SPAN2 and 3), and reruns on Me-TV. I pay attention to ads and commercials, and often react to the faulty logic, as well as the fascinating facts, found therein. (Ask me about a good-sounding piano, or moving a ton of freight by railroad.)

Sailing, physical activity, travel, friends, family, gardening, and food bring me great pleasure. Environmental degradation, uncontrollable climate change, over-population, abuse of scarce resources, and misuse of dangerous materials 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.S. 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.

**Last Words:**

Please feel free to call or write anytime to share experiences or ask questions. Hearing from former students is one of the great joys of being a teacher. However, I do not participate in social media forums such as Twitter, Facebook, Linkedin, etc., so please reach me by ‘old-fashioned’ ways (phone, email, or U.S. mail).

Call my home or cell phone, any day, from 9 a.m. to 10 p.m..
Text to my cell phone number, or email to ethor@depaul.edu at any time.

Thanks for reading this far. Let’s have a worthwhile and fun course!
# Schedule of Topics

**Winter 2017, Loop, Thursday nights**

DePaul SNL   LL 205 Quantitative Reasoning

<table>
<thead>
<tr>
<th>Day #</th>
<th>Class Date</th>
<th>Custom Text Units &amp; Topics: HW due on this date.</th>
<th>Barron’s Math Study Dictionary: Helpful pages &amp; topics for this week.</th>
</tr>
</thead>
</table>
| 1     | Jan. 5     | Introductions Questions & Answers re: Course, etc. Some Basics of Math: “Use the Rules” Start working on assignments | 6-9  Algebra: Basics, Equations  
14-15  Arithmetic: Basics  
38-41  Shapes, Formulas, Fractions, Percents  
86-87  Sets, Venn Diagrams |
| 2     | Jan. 12    | 1 A  Working with Units  
1 B  Problem-Solving with Units  
1 C  Problem-Solving Guidelines & Hints | 2-3  Abbreviations, Mnemonics  
50-51  Kinematics, Speed  
62-67  Number: Forms, Systems, Sets  
88-89  Space, Shapes, Area, Volume  
106-107  Temperature  
116-119  Units, Conversions, SI (‘Metric Sys.’) |
| 3     | Jan. 19    | 2 A  Use vs. Abuse of Percentages  
2 B  Put Numbers in Perspective | 16-19  Arithmetic: Commercial, Four Rules  
36-37  Factors, Multiples, Primes  
98-101  Structures, Rules, Symbols  
104-105  Techniques, Proportion, Exponents |
| 4     | Jan. 26    | 2 C  Dealing with Uncertainty  
2 D  Index Numbers: CPI & beyond  
2 E  How Numbers Can Deceive | 4-5  Accuracy, Significant Digits  
52-55  Logic  
68-69  Pi, Approximations  
110-111  Transformations, Scale Factors |
| 5     | Feb. 2     | 3 A  Taking Control of Your Finances  
3 B  The Power of Compounding  
3 E  Income Taxes | 16-17  Arithmetic: Commercial  
34-35  Eponyms  
122-127  Word: Confusions, Origins, Uses  
128  x,y,z: Math Notation & History |
| 6     | Feb. 9     | 3 C  Savings Plans & Investments  
3 D  Loans, Credit Cards, Mortgages  
3 F  The Federal Budget | 76-77  Probability, Tree Diagrams  
80-81  Quadrilaterals  
112-113  Triangles |
| 7     | Feb. 16    | 4 A  Fundamentals of Statistics  
4 B  Believe a Statistical Study?  
4 C  Statistical Tables & Graphs | 12-13  Angles  
48-49  Information, Spreadsheets, Bytes  
90-97  Statistics |
| 8     | Feb. 26    | 4 D  Graphics in the Media  
4 E  Correlation & Causality | 22-27  Circles, Circle-Based Shapes  
28-29  Coordinate Systems, Graphs  
44-47  Circles, Pie Charts, Graphs |
| 9     | Mar. 2     | 6 A  Growth: Linear vs. Exponential  
6 B  Doubling Time & Half-Life | 30-31  Curves, Asymptotes  
46-47  Graphs: Linear vs. Exponential |
| 10    | Mar 9      | 6 C  Real Population Growth  
6 D  Logarithmic Scales: Earthquakes, ... | 10-11  Algebra: Functions  
62-63  Exponents, Logarithms |
| 11    | Mar. 16    | **Final Exam: Cumulative on all topics.** Review Final Exam and Course Lifelong Learning | 60-61  Number Diversions  
82-83  Recreational Math (Games)  
102-103  Symmetry |