Math 1103 - BIG Problems
The University of Pittsburgh - Spring 2015

MWF 2-2:50   Room 427 - Thackeray Hall

Instructor Information

Instructor:	Jeffrey Paul Wheeler, Ph.D.
Office:	Room 607 Thackeray Hall.
Office Hours:	MWF 11-11:50 or by appointment.
Email:	jwheeler@pitt.edu
Website:	http://www.pitt.edu/~jwheeler/.
Courseweb:	I will heavily use Courseweb.
Office (Dept.) Phone:	412-624-8315 (412-624-8375)

Suggested Textbooks

- *Mathematical Programming - an Introduction to Optimization* by Melvyn W. Jeter, Marcel/Dekker Publishing (CRC Press), ISBN: 978-0-82-477478-3
- *A First Course in Optimization* by Charles L. Byrne, CRC Press, ISBN: 978-1-482-22656-0.
- *Spreadsheet Modeling and Decision Analysis, a Practical Introduction to Business Analytics*, 7th edition, by Cliff T. Ragsdale, Cenage, ISBN: 978-1-285-41868-1. We will borrow much from this book and it is a standard text in MBA programs.
- *Combinatorial Optimization for Undergraduates*, by L.R. Foulds, Springer, ISBN: 0-387-90977-X. This is an excellent text.
- *The Mathematics of Nonlinear Programming*, by A.L. Peressini, F.E. Sullivan, and J.J. Uhl, Jr., Springer, ISBN: 0-387-96614-5.
- *Graphs, Algorithms, and Optimization*, 2nd edition, Willam L. Kocay and Donald L. Kreher, CRC Press 2017, 978-1-4822-5116-6.

Course Content

This will be a problem-solving course where teams of students are assigned optimization or related projects from businesses, government, or private organizations. Some lectures will cover the material students need to address their projects: e.g. topics in probability, statistical methods, optimization techniques not addressed in Math 1101 (such as: iterative methods for unconstrained optimization, the Karush-Kuhn-Tucker Theorem, search techniques, etc.); but most class time will be spent with teams discussing their progress and future plans on the problems. Math 1103 students will be expected to independently learn whatever is necessary for them to fulfill their responsibility on their team's problem. Students will regularly be expected to present their progress. As well, the teams will be expected to present their final results to an audience both to their team's BIG liaison and a mathematical audience.

Evaluation

Grades will be based upon:

- 6 bi-weekly individual progress reports (10% each)

- Final Presentation (40%)

Note: the mathematics of your work is important, but in many ways your communication of it is more important. Hence there will be expectations upon your presentation of your work.

Laptops

If you have a laptop, you will be encouraged to use it and have a copy of Excel. We will use Microsoft Excel's built-in solver on numerous occasions, though you are welcome to use Mathematica, Maple, Matlab, etc.

Calendar

First Day of Class:	Monday, January 5
Add/Drop Period Ends:	Friday, January 16
MLK Day (University closed):	Monday, January 19
Spring Recess:	Sun-Sunday(incl.), March 8-15
Last Day of Class:	Friday, April 17

Email 101

Please be aware that you are writing me, the instructor of your mathematics course at a major university, and not text-messaging a friend. There should be something in the Subject box (e.g. "Homework Question"). The opening of the email should be something of the order of *"Dear* (or *Hello) Dr. Wheeler,"*. As well, please note that *you* is spelled "y-o-u", not "u", and *are* is spelled "a-r-e", not "r". Proper grammar and punctuation are expected. Lastly, please be sure to close your correspondence by stating your name.

Some very good business email etiquette can be seen at:
`http://www.businessemailetiquette.com/business-e-mail-etiquette-basics`
and general email etiquette at:
`http://www.101emailetiquettetips.com/`

Academic Misconduct:

Cheating/plagiarism will not be tolerated. Students suspected of violating the University of Pittsburgh Policy on Academic Integrity, from the February 1974 Senate Committee on Tenure and Academic Freedom reported to the Senate Council, will be required to participate in the outlined procedural process as initiated by the instructor. A minimum sanction of a zero score for the quiz or exam will be imposed.

Disability Resources and Services

If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and Disability Resources and Services, 140 William Pitt Union, 412-648-7890 or 412-383-7355 (TTY) as early as possible in the term. DRS will verify your disability and determine reasonable accommodations for this course.

Advice for Future Consultants

Josh Figaretti, a long-time consultant for Ernst & Young and now an executive at Chick-fil-A, offers the following advice about consulting:
   A good consultant will:

1. have the ability to quantify abstract terms and articulate return on investment (ROI);
2. know about boundary and exception conditions (consultants cannot live in a happy place - where do things break?);
3. know how to validate solutions;
4. be a creative problem solver (an important part of consulting is to get people to think differently - i.e. consultants give fresh views); and
5. know basic finance.