INSY 3410 – Deterministic Operations Research – Fall 2014  
INSY 4970* – Special Topics: Deterministic OR – Fall 2014

Instructor: Dr. Chase Murray  
E-mail: All e-mail communication will be handled via Canvas.  
Office: 3301F Shelby  
Office Hours: Posted on Canvas and outside the instructor’s office door.

Teaching Assistants (TAs): See Canvas for contact information, office hours, and office locations.

- Prerequisites: ENGR 1110 – Introduction to Engineering; MATH 2660 – Topics in Linear Algebra.  
- Credit Hours: 3  
- Course Website: Canvas will be used for all course grades, for e-mail, material distribution, etc.  
- Lecture Schedule: Mon/Wed/Fri, 2:00 – 3:00pm, Shelby 1103.

2014 Catalog Description: Formulation, solution, interpretation, and implementation of mathematical models in operations research including linear programming, integer programming and network flows.

Topics Covered:

- Modeling Deterministic Optimization Problems  
- Linear Programming  
  - Modeling  
  - Solving with Software (Excel and Gurobi)  
  - Simplex Method  
  - Sensitivity Analysis  
- Integer Programming  
  - Modeling  
  - Solving with Software (Excel and Gurobi)  
  - Branch-and-Bound  
- Heuristics  
  - Simulated Annealing  
  - Tabu Search  
- Network Flows  
  - Shortest Path  
  - Max Flow  
  - Minimum Spanning Tree  
  - Transportation  
  - Transshipment  
  - Assignment  
- Deterministic Dynamic Programming  
- Nonlinear Programming (time permitting)

* Enrollment in INSY 4970 requires the approval of the Department's Graduate Director (Dr. Jorge Valenzuela).
Required Material:
- **Software:** Gurobi, Excel, MATLAB, Python, and LaTeX (all available in Engineering computer labs).

Supplementary (Optional) Texts:
  - [https://sites.google.com/site/jonleewebpage/home/publications/#book](https://sites.google.com/site/jonleewebpage/home/publications/#book)

Course Requirements/Evaluation:
Students will be evaluated based on the following:

<table>
<thead>
<tr>
<th>Item</th>
<th>Date (Subject to Change)</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework and Projects</td>
<td>Miscellaneous</td>
<td>15%</td>
</tr>
<tr>
<td>Exam 1</td>
<td>October 1 (subject to change)</td>
<td>25%</td>
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<tr>
<td>Exam 2</td>
<td>November 12 (subject to change)</td>
<td>25%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>Wednesday, Dec. 10, 4:00pm – 6:30pm</td>
<td>35%</td>
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**Final course grades** will be determined based on the following scale:

- Student’s Final Average $\geq 90.0\%$ A (superior)
- Student’s Final Average $\geq 80.0\%$ B (good)
- Student’s Final Average $\geq 70.0\%$ C (acceptable)
- Student’s Final Average $< 60.0\%$ D (passing)
- Student’s Final Average $< 60.0\%$ F (failure)

Do not expect your grade to be “rounded up.”

**You must have an average of C or better on the exams to receive a final grade of C or better.**

**Exams:** All exams will be closed-book and closed-notes, unless specified otherwise by the instructor. The Final Exam will be held during Finals Week (Wednesday, December 10, 4:00pm).

**Exam Makeup Policy:** Exams missed with appropriate Tiger Cub excuses must be made-up according to the following schedule: Makeup exams will take place at 7:00am on the Monday following the originally-scheduled exam, unless the instructor specifies otherwise. An exam missed without an appropriate Tiger Cub excuse will result in a grade of zero (0) for that exam.

**Homework:** Homework is a critical component of the course. Although you may discuss the assignments with your classmates, all work that you submit must be your own work. Homework assignments are due at the beginning of lecture on their due date. Late homeworks will not be accepted.

**Attendance:** While attendance is highly recommended, it will not be an explicit factor in the course grade.
Unannounced Quizzes: There will be no unannounced quizzes in this course.

Grade Disputes: If you disagree with the manner in which an assignment was graded, you may request a re-evaluation of your assignment within two (2) weeks of the due date of that assignment. You must submit a detailed explanation, not exceeding one-half page in length, describing why you believe your answer was correct. I will consider each case at the end of the term, but only if it appears that it may change your final grade. Obvious arithmetic errors will be corrected immediately.

Calculator Policy: All electronic devices, including calculators, are prohibited during class exams unless specified otherwise by the instructor.

Disabilities: Any student with a disability needing special accommodation should notify the instructor and contact Dr. Sarah Colby Weaver, Director of the Program for Students with Disabilities, located in 1244 Haley Center.

Academic Honesty: All portions of the Auburn University student academic honesty code (Title X11) found in the Tiger Cub will apply to this class. All academic honesty violations or alleged violations of the SGA Code of Laws will be reported to the Office of the Provost, which will then refer the case to the Academic Honesty Committee. Violations include, but are not limited to:

- **Cheating on an examination** – This includes such things as copying from another’s paper, using unauthorized notes, calculators, etc., or giving or receiving unauthorized aid, such as trading examinations, whispering answers, passing notes, or using electronic devices to transmit or receive information.

- **Plagiarism** – This is using someone else's work without giving credit. It is, for example, using ideas, phrases, papers, laboratory reports, computer programs, data - copied directly or paraphrased - that you did not arrive at on your own. Sources include published works such as book, movies, web sites, and unpublished works such as other students' papers or material from a research service. In brief, representing someone else's work as your own is academically dishonest. The risk of plagiarism can be avoided in written work by clearly indicating, either in footnotes or in the paper itself, the source of any major or unique idea or wording that you did not arrive at on your own. Sources must be given regardless of whether the material is quoted directly or paraphrased.

*Copying any part of another student's assignment and putting your name on it is plagiarism.*

- **Unauthorized collaboration** – This is working with or receiving help from others on graded assignments without the specific approval of the instructor. *If in doubt, seek permission from the instructor before working with others.* Students are encouraged to learn from one another: Form study groups and discuss assignments, but each assignment must be individual work unless specifically stated and turned in as a group assignment.

- You are encouraged to talk to one another about your assignments, however, all assignments must be done by the student(s) whose name is (are) on it!

- **Multiple submission** – This means using the same work to fulfill the academic requirements in more than one course. *Prior permission of the instructors is essential.*

Syllabus prepared by C. Murray

*Revision History:*

8/17/14 – Official version of syllabus posted to Canvas.