**APSC 1001: Introduction to Engineering for Undeclared Majors**

**Professor:** Dr. Bhagi Narahari: [narahari@gwu.edu](mailto:narahari@gwu.edu)

Co-Instructor(Lab): Hetal Patel, Office Hours: Fridays 12:30-2:30pm

Graduate Assistant: Randall Schur, Office Hours: Tuesday 2:00–4:00 pm, Fridays 12:30–2:00 pm

**Course Information**

Dates: 09/25/15 - 11/13/15

Time: Friday 9:35-12:20

Location:

Lecture: SEH Room B1270, 9:35am—10:25am

Lab: Tompkins Hall Room 411, 10:40—12:20pm

**Course Description**

An introduction to disciplines within Engineering and applied science. The course will expose the student to engineering problem solving methodology enabled by data measurements, data collection, computational modeling and analysis. The course will provide an overview of Matlab and its use as a computational modeling and analysis tool. Case studies of potential solutions to problems are presented by practitioners of civil and environmental engineering; computer

science; electrical, computer, and biomedical engineering; mechanical and aerospace engineering; and systems engineering.

**Course Learning Objectives**

1. To understand the diverse engineering programs.

2. To gain perspective of one’s strengths and interest areas.

3. To apply engineering principles to solve problems.

4. To gain an understanding of computational modeling and analysis using Matlab.

**Course Requirements/Grading:**

Class Participation: 10% Weekly Quiz: 15% Homework: 35% Projects: 40%

Format: There are typically three components each week: a lecture session that will address one topic (or discipline), an experiments session during the lab section, and a Matlab session. Each session will be 50 minutes long.

**Schedule**

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| **Date** | **Topics** |
| **9/25** |  Introduction and What is Engineering   Grand Challenges   MATLAB: Intro and Plotting Data |
| **10/2** |  Lecture: Electrical and Computer Engineering   Experiment: Sensors & Arduinos   MATLAB: Curve Fitting |
| **10/9** |  Lecture: Civil and Environmental Engineering   Experiment: Environmental   MATLAB: Modeling |
| **10/16** |  Lecture: Mechanical and Aerospace Engineering   Experiment: Solidworks and 3D Printing   MATLAB: Simple Systems |
| **10/23** |  Lecture (a): Systems Engineering   Lecture (b): Biomedical Engineering   Experiment: Measuring Body Signals |
| **10/30** |  Lecture: Computer Science   Experiment: Computer Science Concepts   MATLAB: Image Processing |
| **11/6** |  Lecture: Presentation Skills and students short presentations   Lab: GW Career Services: STRONG Assessment   MATLAB: Final Project discussions and implementation |
| **11/13** | Final Projects Presentations |

**Tentative Schedule of Homework Assignments**

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| **Due Date** | **Assignment** |
| **10/2** | MATLAB Worksheet: Intro and Plots |
| **10/9** | MATLAB Worksheet: Curve Fitting |
| **10/16** | MATLAB Worksheet: Simple Systems |
| **10/23** | MATLAB Worksheet: Bridge Modeling |
| **10/30** | MATLAB vs. Code Academy Exercises STRONG Assessment |
| **11/6** | MATLAB: Noise Removal Worksheet  PPT on Image Processing/Idea Pitch |
| **11/13** | **Final Project** |

**Academic Integrity**

Cheating is strictly forbidden in this class and any such action will be interpreted as a violation of the “GWU Code of Academic Integrity”. In case of violations, the cases will be reported to the department and the procedures described in the “GWU Code of Academic Integrity” will be

initiated. Please refer to the following web site for a further understanding of the “GWU Code of

Academic Integrity” <http://studentconduct.gwu.edu/code-academic-integrity>

Academic dishonesty is defined as cheating of any kind, including misrepresenting one’s own work, taking credit for the work of others, and the fabrication of information. Cheating in the context of this class generally falls under two categories.

• Plagiarism - intentionally representing the words, ideas, or sequence of ideas of another as one’s own; failure to attribute any of the following: quotations, paraphrases, or borrowed information.

• Fabrication - falsification or invention of any data, information, or citation with intent to deceive.

**Disability Accommodations**

Any student who may need an accommodation based on the potential impact of a disability should contact the Disability Support Services office at 202-994-8250 in Rome Hall, Suite 102, to establish eligibility and to coordinate reasonable accommodations. For additional information please refer to: <http://gwired.gwu.edu/dss/>