**Mathematics in Industry and Government Syllabus**

CLASSROOM EXPECTATIONS:

1. BE READY – be prompt, prepared, and participate in **ALL** class activities
2. BE RESPECTFUL – of yourself, others and their property
3. BE RESPONSIBLE – for all assignments, materials and your behavior

COURSE DESCRIPTION:

Mathematics in Industry and Government (MIG) is rooted in Operations Research and is an excel-driven course. “Operations research (OR) is a scientific way to analyze problems and make decisions. OR professionals try to provide a sound basis for decision-making. They attempt to understand and structure complex situations. They use this understanding to predict how the system will behave. Then they try to improve performance. Often OR professionals use numerical and algebraic techniques. They develop mathematical and computer models of a system of people, machines, and procedures. Then they manipulate the models to study the behavior of the system.” (from Intro 2010 North Carolina State University: MINDSET) This course was created through the efforts of the MINDSET Project. **M**athematics **In**struction using **D**ecision **S**cience and **E**ngineering **T**ools (**MINDSET**) is a collaborative project between educators, engineers, and mathematicians at three universities to create, implement, and evaluate a new mathematics curriculum and textbook.

Performance in mathematics is a critical factor affecting students’ success in the areas of sciences and engineering trades and Georgia now requires a fourth year of high school mathematics. The **MINDSET** curriculum uses math-based decision making tools from Operations Research to present standard mathematics concepts in a non-calculus fourth-year mathematics course. The overall goals of the **MINDSET** project are to enhance students’ mathematical knowledge and skills with regard to their ability to formulate and solve multi-step problems and interpret results and to improve students’ attitude toward mathematics thereby motivating them to study mathematics.

COURSE BREAKDOWN:

* **MMIGDD1** – Students will use advanced linear programming to make decisions
  + - Chapter 2 – Linear Programming – Maximization
    - Chapter 4 – Linear Programming – Minimization
    - Chapter 5 – Integer Programming
    - Chapter 6 – Binary Programming
  + **MMIGDD3** – Students will determine the optimal paths and use them to make appropriate decisions
    - Chapter 10 – Critical Path Method
  + **MMIGPD4** – Students will use computer simulations to make decisions
    - Chapter 12 – Probabilistic Modeling
  + **MMIGPD2** – Students will us properties of other distributions (e.g. binomial, geometric, Poisson) to make decisions about optimization and efficiency
    - Chapter 13 – Binomial and Geometric Distribution
    - Chapter 14 – Poisson Distribution
  + **MMIGPD1** – Students will use properties of normal distributions to make decisions about optimization and efficiency
    - Chapter 15 – Normal Distribution
  + **Final Assessment** – Will be cumulative.

LAB RULES:

* + NO FOOD OR DRING ALLOWED IN THE LAB!!!!!
  + Must choose a computer to be assigned to.
  + No use of other students files
    - 1st time offense zero for the assessment
    - 2nd time offense zero for the unit.

PASSES:

* Must have the following IN PEN:
  + Name
  + Where you are going
  + Date
  + Time

GRADE BREAKDOWN:

80% - Formative (presentations, projects, tests, quizzes, etc.)

10% - Summative (Final Assessment)

10% - SLO Test

EXTRA CREDIT

Not Available.

FORMATIVE ASSESSMENTS:

Following each of the above chapters, either a project or a presentation will serve as the formal assessment. Tests or quizzes are still possible throughout the course.

* + Projects – description and rubric provided
    - Will be graded by the teacher (and students) with a rubric
  + Presentations – description and rubric provided
    - Will be graded by:
      * Teacher – 50%
      * Peers (the audience) – 20%
      * Partners within the group – 30%

\* **NOTE: Percentages can vary from project to project. Above is simply an example of the possible weights.**

ATTENDANCE:

Regular attendance is expected for success. Because this is a fast-paced class, you will miss work that will not be retaught upon your return. It is your responsibility to copy all notes and complete all missed assignments. It is NOT the teacher’s responsibility to teach it again.

MAKE-UP WORK:

Missing grades are counted as a “0” until made up. Make-up work is due in a timely manner and ONLY accepted if the absence is excused.

WEBSITE:

The course website will play an integral part in this course. Assignments, Example Projects, Excel Templates, and updates will be displayed on this site. The address is:

[www.dsmath.weebly.com](http://www.dsmath.weebly.com)

STUDY HALL / TUTORING:

Tutoring will be possible every morning before school from 7:45 until 8:00. Afterschool is available upon request.