MINE 461: Applied Mineral Computer Methods
Fall 2018

Instructor: Dr. Qingqing Huang, MRB 359H, qingqing.huang@mail.wvu.edu

Office Hours: Monday, 3:00 to 5:00 PM or by appointment

Lecture Time/Location: T/R: 12:30-1:45 PM; MRB 243

Credit Hours: 3.000

Course Description: Problem solving in mineral processing, mineral resources, mining, and general engineering. Emphasis on applications using various computing technologies.

Prerequisites: Math 251 with a grade of C- or better

Expected Learning Outcomes: This course emphasizes the application of computational tools for solving advanced problems in mining engineering, mineral processing, and general engineering. Having successfully completed this course, the student will be able to:

- Select the appropriate computational tool for a particular problem;
- Search help documentation and other external programming resources to locate information;
- Analyze engineering data using the appropriate computational tools and explain the observed trends using fundamental relationships and engineering judgement;
- Design spreadsheet applications that meet desired user requirements;
- Formulate algorithms and develop custom VBA subroutines and user-defined functions to solve various minerals engineering problems;
- Apply curve and spline fitting techniques to interpret and analyze experimental data;
- Solve mining and minerals related problems using various mine system analysis techniques.

Grading/Assignments: Final grades will be based upon the successful completion of assignments, exercises, exams, and a final project.

- Assignments (~6) 40%
- Exams (~2) 40%
- Final Project 20%

Letter grades will be assigned on a standard 10 point scale with rounding occurring on the first decimal place (90.0 – 100 = A; 80.0 – 89.9 = B; 70.0 – 79.9 = C; 60.0 – 69.9 = D; < 59.9 = F).

References:
Course Schedule:

- Excel Basics & Data Import (~2 weeks)
  - Introduction
  - Excel Formula Basics
  - Data Import
  - Lookup Functions
- Advanced Functions (~2 weeks)
  - Iterative Calculation
  - Array Function
  - Named Ranges
  - Conditional Formulas
  - Text Functions
- Graph & Curve Fitting (~2 weeks)
  - Data Plotting
  - Curve Fitting
  - Form Control
  - Goal Seek
- Custom Functions-VBA (~3 weeks)
  - VBA Introduction & Overview
  - Coding Basics
  - VBA Custom Functions
  - VBA Subroutines
- Non-Linear Equations (~3 weeks)
  - Interval Halving
  - Secant Method
  - Newton’s Method & Newton’s Second Order

Data Integrity: Many portions of this class will require significant computer usage. While computer crashes and malfunctions do happen, students should take every initiative to ensure that such misfortune does not supersede their responsibility to complete and submit assignments in a timely manner. All critical documents should be stored in at least two media whether physical or virtual. This instructor STRONGLY recommends real-time online backup and/or cloud storage. Several free options are available online (Google Drive, Microsoft OneDrive, Dropbox). Any sensitive data or information should be encrypted on physical drives. Should a computer crash occur, inform the instructor immediately to ensure that the appropriate provisions can be made.

Attendance: Regular class attendance is expected. Excused or anticipated absences should be relayed to the instructor at the earliest time. Excuses will be permitted in accordance with the university policy at
the final discretion of the course instructor. Extra credit will be given to those who never misses a single class (a 5% boost in their overall grades).

**Inclusivity Statement:** The West Virginia University community is committed to creating and fostering a positive learning and working environment based on open communication, mutual respect, and inclusion. If you are a person with a disability and anticipate needing any type of accommodation in order to participate in this class, please advise me and make appropriate arrangements with the Office of Accessibility Services (293-6700). For more information on West Virginia University’s Diversity, Equity, and Inclusion initiatives, please see [http://diversity.wvu.edu](http://diversity.wvu.edu)

**Statement of Academic Integrity:** The integrity of the classes offered by any academic institution solidifies the foundation of its mission and cannot be sacrificed to expediency, ignorance, or blatant fraud. Therefore, this instructor will enforce rigorous standards of academic integrity in all aspects and assignments of this course. For the detailed policy of West Virginia University regarding the definitions of acts considered to fall under academic dishonesty and possible ensuing sanctions, please see the Student Conduct Code [http://campuslife.wvu.edu/r/download/180235](http://campuslife.wvu.edu/r/download/180235). Should you have any questions about possibly improper research citations or references, or any other activity that may be interpreted as an attempt at academic dishonesty, please consult the instructor before the assignment is due to discuss the matter.

**Days of Special Concern:** West Virginia University and this course instructor honor the diversity of students and respect the needs of students who must miss class to participate in Days of Special Concern. To ensure that the best mutually beneficial arrangements are made, students should notify the instructor by the end of the second week of classes or prior to the first Day of Special Concern, whichever is earlier, regarding Day of Special Concern observances that will affect attendance.