# ChE 493b: FE CHE Review

# Monday 5-7pm

### **Spring 2019**

### Course Instructor: Dr. Paul Daniell

#### Office Location: 433 Engineering Sciences Building

### Office Hours: Monday-Wednesday 1300 – 1500 and appointment

### Email: [paul.daniell@mail.wvu.edu](mailto:paul.daniell@mail.wvu.edu)

Phone: 304-293-9812, cell: 304-419-3495

###### Recommended Texts: FE Chemical Practice Problems, Michael R. Lindeberg 2016, FE Reference Handbook (you can get this on NCEES web site)

### **Course Goal**: Prepare Students to take and pass the Chemical FE exam. The course is being co taught by Paul Daniell and Jeremy Hardinger. Roughly 50% of the topics will be covered by each. Below is a listing of my topics with expected number of examples.

The class will cover material that involves 4 of the 7 ABET outcomes.

Outcome 1: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

Performance Indicator 1 – Identify, formulate and solve complex chemical engineering problems

Performance Indicator 2 – Apply underlying engineering, science, and mathematics associated to chemical processes

Outcome 2: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors

Performance Indicator 1 – Design processes both for safety and for economics

Performance Indicator 2 – Designing processes with consideration for public health, safety, and welfare

Performance Indicator 3 – Produce optimal solutions with respect to economic and physical constraints

Performance Indicator 4 – Design a chemical process that addresses global, cultural, social and environmental impacts or factors

Outcome 4: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts

Performance Indicator 1 – Apply the engineering code of ethics to a case study of a real world situation

Performance Indicator 2 – Recognize professional responsibilities when considering designs that will have an impact on the environment, economics, and society

Outcome 7: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Performance Indicator 1 – Acquire and apply subject material not significantly covered in class

The class will be only pass/fail and no exams or tests will be given.

FE Topics Paul Daniell

1. Math # examples
   1. Units 3
   2. Algebra/Vectors 10
   3. Analytic Geometry 11
   4. Trigonometry 6
   5. Linear Algebra 3
   6. Calculus 11
   7. Numerical Methods 4
   8. Probability/Stats 17
   9. Diff Eq. 3
2. Fluid Mechanics
   1. Fluid Properties 7
   2. Fluid Statics 7
   3. Fluid Dynamics 17
   4. Flow Measurement/Similitude 7
   5. Fluid Power and Machines 5
   6. Compressible Fluids 5
3. Statics
   1. Pulleys and Cables 4
   2. Trusses 6
   3. Centroids by composite and integration 12
   4. Moments of Inertia 9
4. Engineering Sciences
   1. Kinematics 14
   2. Kinetics 6
   3. Energy/Work 12
   4. Electrostatics 8
   5. DC circuits 12
   6. AC circuits 16
5. Process Design and Econ
   1. Plant and Process Design 5
   2. Engineering Econ 15
6. Health Safety and Environment
   1. Toxicology 9
   2. Hygiene 3
   3. Air Quality 7
7. Ethics and Professional Practice
   1. Professional Practice 10
   2. Ethics 14

Previous Exam (57 problems worked)

Marshall University FE Math Review (18 math problems)

**Academic Integrity and Dishonesty**

As stated in the WVU catalog, Students of West Virginia University are citizens of a broader academic community. As such, the University expects that every member of its academic community share its historic and traditional commitment to honesty, integrity, and the search for truth. To meet these standards, academic dishonesty will not be tolerated.

The catalog defines academic dishonesty as “plagiarism; cheating and dishonest practices in connection with examinations, papers, and/or projects; and forgery, misrepresentation, or fraud as it relates to academic or educational matters.” (<http://catalog.wvu.edu/undergraduate/coursecreditstermsclassification/#academicintegritytext>)

Academic dishonesty in the first instance will result in the following sanction:

• Plagiarism: Student will receive an F / 0 / 2 grade deduction on the assignment

• Cheating on an exam: Student will receive a 0 on the problem / an F / 0 on the exam

• Cheating on a project/paper: Student will receive an F / 0 / grade deduction on the paper

• Forgery, misrepresentation, or fraud: Reprimand / Grade deduction of the semester grade / F in the course

• An Academic Dishonesty Form will be submitted through the department and college offices.

Academic dishonesty in the second and following instances may receive more severe sanctions, which can include up to dismissal from an academic program.

**Social-Justice Statement**

“WVU is committed to social justice. I concur with that commitment and expect to maintain a positive learning environment based upon open communication, mutual respect, and nondiscrimination. WVU does not discriminate on the basis of race, sex, age, disability, veteran status, religion, sexual orientation, color or national origin. Any suggestions as to how to further such a positive and open environment in this class will be appreciated and given serious consideration. 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 Disability Services (304-293-6700)”