COURSE NUMBER & TITLE: ENVT 1500-01 Applied Math For Operators

SEMESTER/YEAR: FALL 2006

LECTURE HOURS: 2 LABORATORY HOURS: 0 CREDIT HOURS: 2

CLASS TIME: 8:00 a.m. - 5:00 p.m. T,W,T,W / August 30-31 and Sept. 6-7,2006

ROOM: EI 107
INSTRUCTOR’S NAME: Bill Mixer
INSTRUCTOR’S OFFICE: EI 108
INSTRUCTOR’S PHONE: 268-2670 or 1-800-442-2963 x 2670
OFFICE HOURS: By appointment during course

COURSE DESCRIPTION: Practical and realistic applications of mathematical formulas and problems related to the operations of water and wastewater treatment plants and collection and distribution systems.

STATEMENT OF PREREQUISITES: DVST 930 or permission of course instructor.

GENERAL OBJECTIVES: To provide the student with a working knowledge of formulas and mathematics used in the wastewater and water treatment and collection and distribution fields.

SPECIFIC OBJECTIVES (Outcomes): The student will be able to demonstrate the ability to correctly calculate the following:

1. Applied Volume for: square, rectangular and round tanks, pipes
2. Flow and velocity: using area and time
3. Converting milligrams per liter to pounds per day for:
   a. Commonly used chemicals in water and wastewater plants
   b. Chlorine, both elemental and hypochlorite compounds
4. Hydraulic loading rates for:
   a. Clarifiers
   b. Filters
5. Organic loading rates for lagoons
6. Percent strength of a solution
7. Mixing different percent strength solutions
8. Detention times for:
   a. Lagoons
   b. Tanks

9. Efficiency calculations for:
   a. Pumps and motors
   b. Process removal and performance efficiency

10. Pumping Calculations for:
    a. Total Static Head
    b. Total Discharge Head
    c. Total Dynamic Head
    d. Head and friction losses
    e. Horsepower to Kilowatt hours
    f. Costs of operation

The student will also be able to demonstrate a knowledge of the following concepts:
   Density
   Specific Gravity
   Water Pressure

METHODOLOGY: This course is designed to be a lecture course.

EVALUATION CRITERIA: Students will be evaluated in regards to class attendance and exercises and exams.

Attendance at each class is required and roll will be taken at each session. There will be a strong correlation between class attendance and the final course grade. Each student is responsible for the materials provided during lecture. It is each student’s responsibility alone to acquire lecture notes, handouts and exercise for missed classes. Excused absences must be cleared with the course instructor so arrangements can be made. No makeup exams will be given.

7 Skill Checks @ 25 points each : 175
3 take home exams @ 50 points each : 150
1 Final Exam 150
Attendance and classroom participation: 25
Total Points 500

Grades Scale:
A = 100 - 90% (500 - 450 pts)
B = 89.9 - 80% (449 - 400 pts)
C = 79.9 - 70% (399 - 350 pts)
D = 69.9 - 60% (349 - 300 pts)
AUDIT: Students who chose to audit this course will not be responsible for taking the final exam but are responsible for all other course requirements and attendance. Students may switch to audit up until the morning session of the third day of class.

LATE EXAMS: Take home exams are due the next day in class unless otherwise noted. I will provide you with a due / postmark date. If the exams are late, 10% of the total score will be deducted for each day they are late.

REQUIRED TEXT, READINGS, MATERIALS:


LAST DATE TO CHANGE TO AUDIT STATUS: Morning session of day three.

LAST DATE TO WITHDRAW WITH A "W" GRADE: See current college catalog

STUDENT RIGHTS AND RESPONSIBILITIES: Please refer to the Casper College Student Conduct and Judicial Code for information concerning your rights and responsibilities as a Casper College Student.

Chain of Command: If you have any problems with this class, you should first contact the instructor in order to solve the problem. If you are not satisfied with the solution offered by the instructor, you should then take your problem through the appropriate chain of command starting with the department head, then the division chair, and lastly the vice president for academic affairs.

Academic Dishonesty - Cheating & Plagiarism: Casper College demands intellectual honesty. Proven plagiarism or any form of dishonesty associated with the academic process can result in the offender failing the course in which the offense was committed or expulsion from school. See the Casper College Student Code of Conduct.

ADA Accommodations Policy: It is the policy of Casper College to provide appropriate accommodations for any students with a documented disability. More information may be found at the following location: Disability Services. You may also contact the instructor or the following people for any questions that may arise.

Ann Loader: aloader@caspercollege.edu, Individual Learning Specialist or by telephone 307-268-2557

Kim Byrd: kbyrd@caspercollege.edu, Specialist in Testing, Advisement & Retention or by telephone 307-268-2255
CALENDAR OR SCHEDULE:

**Tentative Class Schedule:** This schedule is tentative and all changes to the class schedule will be announced as the class progress.

**DAY 1**
1. Introductions
2. Chapter 1 / Applied Volume Calculations
   Lecture: pages 1-10 and Practice problems
3. Skill Check
4. Chapter 2 / Flow and Velocity Calculations
   Lecture Pages 16 - 24 and Practice Problems
   Lecture Pages 26 - 29 and Practice Problems
   Lecture Pages 32 - 33 and Practice Problems
5. Skill Check
6. Chapter 3 / Milligrams per Liter to Pounds
   Lecture Pages 35 - 41 and Practice Problems
   Lecture Pages 42 - 45 and Practice Problems
7. Take Home Exam 1

**DAY 2**
1. Review
2. Skill Check
3. Chapter 4 / Loading Rates
   Lecture Pages 56 - 71 and practice problems
4. Skill Check
5. Chapter 5 / Detention Times
   Lecture: Pages 86-89 and Practice Problems
6. Skill Check
7. Take Home Exam 1 - Due back
8. Take Home Exam 2 - Due next class at beginning of class
**DAY 3**

1. Review
2. Take Home Exam 2  Due
3. Chapter 6 / Efficiency and Percent Calculations
   - Lecture: Pages 104 -105 and Practice Problems
   - Lecture: Pages 114 -117 and Practice Problems
   - Lecture: Pages 118 - 119 and Practice Problems
4. Skill Check
5. Chapter 7 / Pumping Calculations
   - Lecture: Pages 130 -133 and Practice Problems
   - Lecture: Pages 134- 137 and 141 and Practice Problems
6. Skill Check
7. Take Home Exam 2 - Review
8. Take Home Exam 3

**Day 4**

1. Review
2. Take Home Exam 3 - Due in class and Review
3. Chapter 7 / Pumping Calculations
   - Lecture: Pages 142- 149 and Practice Problems
   - Lecture: Pages 150 -155 and Practice Problems
4. Skill Check
5. Final Exam