I. TITLE: Water Quality Technology II

II. CATALOG DESCRIPTION:
The course of study is a continuation of CET 330 and includes fundamental design and operation of water treatment and reclamation systems. Topics include analyses of water characteristics, system design, and related chemical, biological, and hydraulics concepts. Prerequisite: CET 330

III. PURPOSE:
Successful completion of this course will enable a student to apply basic hydraulics, assess the impact of pollution on receiving waters, and conceptually design fundamental treatment systems.

IV. COURSE OBJECTIVES:
The course will introduce students to scientific and engineering technology concepts and computational methods needed to design water treatment systems for potable and industrial uses and water reclamation systems for industrial and municipal dischargers. Hydrologic, public health, and regulatory considerations are included. At the conclusion of this course, successful students will be able to conceptually design the common components of treatment systems, understand the purpose of each process, and understand the potential public health and environmental impacts of incomplete treatment.

V. CONTENT OUTLINE:
See attachment.

VI. INSTRUCTIONAL ACTIVITIES:
Classroom lectures, library research, and small group design projects will be included.

VII. FIELD, CLINICAL, AND/OR LABORATORY EXPERIENCES:
Laboratory and field exercises will be integrated into the course. Topics will include the following:

A. Microbiology and Disinfection/Chlorine
B. Dissolved oxygen, BOD, and COD
C. Solids
D. Nutrients
E. Water Reclamation Plant Visit
F. Surface Water Quality Assessment
VIII. **RESOURCES:**
Students will use computers for data analyses, graphics, and report presentation.

IX. **GRADING PROCEDURES:**
- Quizzes (2) - 30%
- Homework/Lab - 25%
- Tech Report - 15%
- Project - 30%
Letter grades of A, B, C, D, and E will be assigned based on student performance.

The technical report will consist of 6 to 8 pages of text (double spaced, word processed) and a Power Point presentation. The topic will be student-selected. References from the internet, books, and journal articles must be included. An oral presentation is required.

The final project will be the conceptual design of a water reclamation system.

X. **ATTENDANCE POLICY:**
This course will adhere to the policy published in the [MSU Undergraduate Bulletin](#).

XI. **ACADEMIC HONESTY POLICY:**
This course will adhere to the policy published in the [MSU Undergraduate Bulletin](#). Cheating, plagiarism (submitting another person’s material as one’s own), or doing work for another person which will receive academic credit are all impermissible. This includes the use of unauthorized books, notebooks or other sources in order to secure or give help during an examination; the unauthorized copying of examinations, assignments, reports or term papers; or the presentation of unacknowledged material as if it were the student’s own work. Disciplinary action may be taken beyond the academic discipline administered by the faculty member who teaches the course in which the cheating took place.

XII. **TEXT AND REFERENCES:**

XIII. **PREREQUISITES:** CET 330

XIV. **STATEMENT OF AFFIRMATIVE ACTION AND EQUAL OPPORTUNITY:**

Murray State University endorses the intent of all federal and state laws created to prohibit discrimination. Murray State University does not discriminate on the basis of race, color, national origin, gender, sexual orientation, religion, age, veteran status, or disability in employment, admissions, or the provision of services and provides, upon request, reasonable accommodation including auxiliary aids and services necessary to afford individuals with disabilities equal access to participate in all programs and activities. For more information, contact Director of Equal Opportunity, 103 Wells Hall. 270-809-3155 (voice), 270-809-3361 (TDD).
CET 331 Tentative Content and Schedule

Chapter 9, Wastewater Flows and Characteristics
Chapter 3, BOD and kinetic rates
Chapter 11, Wastewater Processing (plus Chapter 3 Microbiology)
Chapter 4, Streamflow
Chapter 5, Clean Water Act and TMDLs

The project, a wastewater treatment plant conceptual design will be completed about mid semester. The technical report and presentation may be split into two different reports. One report may address a treatment technology or biosolids handling. The second report may be development of a TMDL.

General Topics

First two thirds of semester

Water Reclamation
  Microbiology
  Characteristics
  Treatment Systems
  Pretreatment
  Primary Treatment
  Secondary Treatment
  Disinfection
  Advanced Treatment
  Biosolids

  Labs:
  BOD/COD, Nutrients, Solids

Last third of semester

Water Quality Management
  Regulations
  Pollutant Sources and Impacts
  TMDL Development
  Water Quality Chemical and Biological Assessment

  Labs:

  Metals, Bioassessment, Habitat, Streamflow

Dr. Mike Kemp, Spring 2011