



CE 552

Water Resource Engineering Design

Fall 2024

Instructor and Contact Information:

Instructor: Joshua K. Roundy, Ph.D., P.E.

Associate Professor of Civil, Environmental,
and Architectural Engineering
2153 Learned Hall
785-864-3134
jroundy@ku.edu

Office Hours:

TR 10:45 to 12:30 PM
You may also send an
email to ask a question
or to schedule a
meeting.

GTA: Payal Makhasana

2151 B Learned Hall
prmakhasana@ku.edu

Office Hours:

Friday 11-2pm in
Learned Hall 1147

Required Texts and Instructional Materials:

Required Text: Fishman, Charles (2011). *The Big Thirst: The Secret Life and Turbulent Future of Water* (1st edition), Free Press ISBN: [978-1-439-10208-4](#).

Recommended Text: Mays, L. W. (2019). *Water Resources Engineering* (3rd edition), Wiley ISBN: [978-1-119-49057-9](#).

Required Software: Assignments will be completed using a variety of software available in the Engineering Computer Labs and includes Excel, EPA-Net, ArcGIS, HEC-HMS and Jupyter Notebooks.

Class Time and Location:

Class Time & Location: Tuesday and Thursday 9:30 – 10:45 AM LEEP2 2420
Lab Time & Location: Thursday 2:30 - 5:20 PM Eaton 1014-1018

Course Description:

The course is an introductory course in the design of water resources systems. Principles of fluid mechanics, hydrology and engineering economics are applied to the design of pipelines, pumping systems, water distribution networks, drainage systems, flood control systems and hydropower installations.

Instructional Mode and Credit Hours:

This course is offered as an in-person course that fulfills 3 credit hours; Consistent with [KU policy](#) and the federal definition of a credit hour, this means you should expect to spend at least 9 hours a week on this course over the 15-week semester. Most weeks, 3 hours will be instructional time in the classroom (i.e., class meetings) and the remaining time will involve out-of-class work.

Course Learning Outcomes:

Upon successful completion of this course, the student will be able to:

- Apply the fundamental knowledge of fluid mechanics and hydrology to solve water engineering problems (ABET Outcome 2).
- Work collaboratively with others to complete applied engineering projects (ABET Outcome 3).
- Write an effective technical report (ABET Outcome 5).
- Consider broader impacts of engineering design that include public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors (ABET Outcome 6).
- Develop Individual analysis of the design problem through acquiring new knowledge as needed, using appropriate learning strategies (ABET Outcome 7).
- Be prepared to succeed on the FE Exam.

Instructor's Attendance/Participation Policy:

The knowledge and skills you will gain in this course are dependent on your participation in class activities and are part of your grade in this course. Because of that, the student is expected to attend all class sessions unless they are ill or have a [University excused absence](#). In the event that the student has to miss class, please talk to the instructor beforehand. If you need to report an extended illness or serious accident, please contact Student Support and Case Management at studentsupport@ku.edu or 785-864-7022.

Course Requirements:

Every student will be required to complete four types of learning assessments in order to demonstrate sufficient learning and retention of the course content and meet the overall learning objectives for the course. There is a total of 1800 points possible through the course across all four learning assessments and each is outlined below:

- **Design Project Reports (DP)** - There are 10 design projects in the class and each is worth 100 points. DPs are broken up into two parts. The first part (DP-G) is completed as a group with one copy of the report turned in for the group and is worth 75 points. The second part (DP-I) consists of an individual design calculation that will be graded on an individual basis and is worth 25 points. Design projects are turned in as a PDF in Gradescope along with individual design calculations. A rubric will be used to grade the design project reports. The grading rubric and an example report is given in the first course module. Design projects are worth a total of 1000 points.
- **Quizzes (QZ):** There are 10 QZs based on the lab videos. QZs are completed online through Gradescope before each lab. Each QZ is worth 10 points for a total of 100 points throughout the semester.
- **Evaluation/Discussion (ED):** At the end of every week, you will have to submit an ED assignment through Gradescope. The ED assignment consists of two parts. The first part (10 points) consists of evaluating your group work during the Thursday Lab. The second part (10 points) will consist of summarizing the discussion (at least 400 words). Every

Thursday class will have a portion devoted to discussing a section of the assigned book. To receive full credit for the discussion you must be present during the class. There are 10 ED assignments throughout the semester and each submission is worth 20 points for a total of 200 points.

- **Exams (EX):** There are three exams and one final in the course. The unit exams (EX 1-3) will be taken during the lab period. The unit exams will be multiple choice with problems like what may appear on the FE. Each exam only covers the content for the specific unit and is worth 100 points each. The final exam will be a take home exam that is worth 200 points. The final exam will be like the design projects but will be completed on your own and will be discussed during the last week of class. Unit exams and the final makeup a total of 500 points

Classroom Behavior Expectations:

This course aims for ALL students to experience a safe learning environment. It is possible that a student may not agree with everything that is said or discussed in the classroom. Please be courteous and respectful to everyone and be sure that you make a distinction between criticizing an idea and criticizing the person.

Students who engage in disruptive behavior, including persistent refusal to observe boundaries defined by the instructor regarding inappropriate talking, discussions, and questions in the classroom or laboratory may be subject to discipline for non-academic misconduct for disruption of teaching or academic misconduct, as defined in the [Code of Student Rights and Responsibilities \(CSRR\)](#). The CSRR also defines potential sanctions for these types of infractions.

Except for in cases of a [University Excused Absence](#), all assignments are due by the day/time indicated in the course calendar.

Special Accreditation Requirements:

This course is designed to meet ABET Student Outcomes: 2,3,5,6,7.

Evaluation Criteria with Grading Scale:

An overall course grade will be assigned based on the following cumulative point system:

Design Project Reports	10 reports worth 100 points each	1000
Quizzes	10 quizzes worth 10 points each	100
Evaluation/Discussion	10 eval/disc worth 20 points each	200
Exams	3 exams worth 100 points	300
Final Exam	1 take final exam worth 200 points	200
TOTAL POINTS		1800

Letter Grades will be assigned as follows:

Grade	Points
A	1680-1800
A-	1620-1679
B+	1560-1619

Grade	Percentage Range
C+	1380-1439
C	1320-1379
C-	1260-1319

B	1500-1559
B-	1440-1499

D	1080-1259
F	< 1080

These thresholds may be adjusted downwards (in the students favor) at the instructor's discretion but will not be adjusted upwards.

At the conclusion of this course, the University will provide an opportunity for you to provide feedback via an online (anonymous) Student Survey of Teaching. The student is strongly encouraged to take advantage of this opportunity to provide feedback. More generally, please feel free to tell the instructor what is working well, and what is not working as well during the semester.

Academic Integrity and Profession Conduct:

Academic misconduct by a student shall include, but not be limited to, disruption of classes; threatening an instructor or fellow student in an academic setting; giving or receiving of unauthorized aid on examinations or in the preparation of notebooks, themes, reports or other assignments; knowingly misrepresenting the source of any academic work; unauthorized changing of grades; unauthorized use of University approvals or forging of signatures; falsification of research results; plagiarizing of another's work; violation of regulations or ethical codes for the treatment of human and animal subjects; or otherwise acting dishonestly in research.

The issue of digital plagiarism has raised concerns about ethics, student writing experiences, and academic integrity. The student will be asked to submit some assignments in a digital format so that the paper can be checked against Web pages and databases of existing papers. Although the student may never have engaged in *intentional* plagiarism, many students incorporate sources without citations. This constitutes plagiarism and cannot be treated differently than intentional plagiarism. The KU Writing Center offers a student writing guide with links to useful information regarding plagiarism and how to avoid it (<http://writing.ku.edu/writing-guides>). If the student is not sure how to use a source in a document, please visit <http://writing.ku.edu/paraphrase-and-summary> or ask the instructor.

Student Access Center:

The Student Access Center (SAC) coordinates academic accommodations and services for all eligible KU students with disabilities. If a student has a disability for which they wish to request accommodations and have not contacted SAC, please do so as soon as possible. SAC is located in 22 Strong Hall and can be reached at [785-864-4064](tel:785-864-4064) (V/TTY). Information about their services can be found at access.ku.edu. Please contact the instructor privately regarding needs in this course.

Other Notes:

If the student has trouble with the reading materials, lectures, or with the pace of the class, please contact the instructor as soon as they are aware of the difficulty. The instructor will work with the student to improve their study skills or to overcome particular obstacles that may interfere with optimal performance in this class. Please talk to the instructor early in the course if there is a suspect or anticipate difficulty in this class!

As a premier international research university, the University of Kansas is committed to an open, diverse and inclusive learning and working environment that nurtures the growth and development of all. KU holds steadfast in the belief that an array of values, interests, experiences, and intellectual and cultural viewpoints enrich learning and our workplace. The promotion of and support for a diverse and inclusive community of mutual respect require the engagement of the entire university.

All members of our campus community must accept the responsibility to demonstrate civility and respect for the dignity of others. Expressions or actions that disparage a person's or group's race, ethnicity, nationality, culture, gender, gender identity, religion, sexual orientation, age, veteran status, or disability are contrary to the mission of the University and are not acceptable in my classroom.

Students shall not be penalized for absence from regularly scheduled class activities that conflict with mandated religious observances ([USRR 2.2.3](#)). In cases of conflicts between class activities and mandated religious observances, the student is responsible for initiating discussion with the instructor to reach a mutually acceptable solution. **If the student anticipates missing class because of a religious observance, please contact the instructor as soon as possible so that alternative arrangements can be made.**

Additional Resources and Policy Information for Students:

In addition to the policies noted above, the following links and resources may be helpful to the student for this course, as well as for others they may be taking. If there are any questions or concerns about any of these policies, statements, or resources, please let the instructor know. In addition, please visit the [Student Resources website](#) (KU Academic Success) for additional policies and resources.

- [Change of Grade Policy](#) and [USRR, Section 3: Change of Grade](#)
- [Code of Student Rights and Responsibilities](#)
- KU Policy on [Commercial Notetaking](#)
- [KU Statement on Diversity and Inclusion](#)
- [Mandatory Reporting](#) (Civil Rights & Title IX)
- [Nondiscrimination, Equal Opportunity, and Affirmative Action](#)
- [Racial and Ethnic Harassment Policy](#)
- [Sexual Harassment](#)
- [Counseling and Psychological Services](#)
- [Kansas Board of Regents Statement on Freedom of Expression](#)
- [Student Support and Case Management](#)

Course Schedule:

Dates	Topic
Aug 26 - Sep 1	Delivery of Horton Kansas Drinking Water
Sep 2 - Sep 8	Rural Water District Transfer
Sep 9 - Sep 15	Rural Water Distribution System (No Class Tuesday)
Sep 16 - Sep 22	Exam 01
Sep 23 - Sep 29	Stranger Creek Watershed
Sep 30 - Oct 6	Stranger Creek Watershed Model
Oct 7 - Oct 13	Irrigation Channel Design
Oct 14 - Oct 20	No Class or Lab (Instructor at Research Meeting)
Oct 21 - Oct 27	Exam 02
Oct 28 - Nov 3	City of Lawrence Culvert Design
Nov 4 - Nov 10	Tonganoxie Storm Drainage
Nov 11 - Nov 17	Office Park Flood Detention
Nov 18 - Nov 24	Tuttle Creek Hydropower
Nov 25 - Dec 1	No Class (Thanksgiving Break)
Dec 2 - Dec 8	Exam 03
Dec 9 - Dec 12	Final Project Preparation
Dec 19	Final Project Due by 11:59pm

The schedule is subject to change throughout the semester.