

Transportation-Water-Materials Design

CGN 4806 Section 05BD

Class Periods: M | Periods 3 – 5 | 9:35 AM – 12:35 PM

Location: TUR2353

Academic Term: Fall 2025

Instructor:

Name: Shirish Bhat

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Office Phone Number: TBD

Office Hours: Mon 3:00 PM – 6:00 PM (Teams/Zoom); by appointment during after-hours.

Teaching Assistant/Peer Mentor/Supervised Teaching Student:

TBD

Course Description

Simulation of a design project experience through the completion and presentation of a comprehensive roadway project design. Students work in multi-disciplinary groups to complete a system design that includes traffic, materials, hydrologic and geotechnical considerations. 3 credits.

Course Pre-Requisites / Co-Requisites

Senior standing.

Course Objectives

Expose students to the business of engineering design by participating in multidisciplinary teams in an actual design project with as realistic conditions as can be created in the classroom. This course intends to incorporate material learned from the relevant courses taken to date and use the science and engineering fundamentals along with the ability to communicate clearly about what is being done in solving a design problem. At this stage, the student should be able to perform the assigned design project in this class with little or no technical instruction.

Materials and Supply Fees

N/A

Relation to Program Outcomes (ABET):

Outcome	Coverage
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	Low
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	High
3. An ability to communicate effectively with a range of audiences	Medium
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	Low
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	High
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	Low
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Low

Required Textbooks and Software

No textbook is required.

Recommended Materials

The following is a partial list of reference materials that are available for free. Other references will be recommended and/or provided as deemed necessary.

Florida Department of Transportation Design Manual (FDM)

<http://www.fdot.gov/roadway/FDM/>

Florida Department of Transportation Standard Plans for Road Construction

<http://www.fdot.gov/design/standardplans/>

Florida Department of Transportation Standard Specifications for Road and Bridge Construction (Divisions II & III), Special Provisions and Supplemental Specifications

<http://www.fdot.gov/programmanagement/default.shtm>

Florida Department of Transportation Drainage Manual

<http://www.fdot.gov/roadway/Drainage/ManualsandHandbooks.shtm>

Florida Department of Transportation Drainage Design Guide

<https://www.fdot.gov/roadway/Drainage/Manualsandhandbooks.shtm>

Florida Department of Transportation Manual on Uniform Traffic Studies (MUTS)

<https://www.fdot.gov/traffic/TrafficServices/Studies/MUTS/MUTS.shtm>

Manual on Uniform Traffic Control Devices (MUTCD) - 2009

<http://mutcd.fhwa.dot.gov/>

Florida Department of Transportation Flexible Pavement Design Manual

<http://www.fdot.gov/roadway/PM/publicationS.shtm>

Florida Department of Transportation Rigid Pavement Design Manual

<http://www.fdot.gov/roadway/PM/publicationS.shtm>

Florida Department of Transportation Traffic Engineering Manual

<http://www.fdot.gov/traffic/TrafficServices/Studies/TEM/tem.shtm>

Federal Highway Administration Hydraulic Engineering Circular Number 18 (HEC 18).

http://www.fhwa.dot.gov/engineering/hydraulics/library_arc.cfm?pub_number=17

Florida Department of Transportation Project Development and Environment Manual, Parts 1 and 2

<http://www.fdot.gov/environment/pubs/pdeman/pdeman1.shtm>

Required Computer

UF student computing requirement: <https://news.it.ufl.edu/education/student-computing-requirements-for-uf/>

Course Schedule

Week #	Date	Phase	Topics
0	8/21/2025		Class begin - no class
1	8/25/2025	I	Course and project overview, public communication, sustainability basics, roadway plan reading basics, project area geotech review
2	9/1/2025		Labor Day – no class
3	9/8/2025	I	Technical proposal writing, project schedule, bid price proposal, sustainable pavement review, assignment I-1 due.
4	9/15/2025	I	Technical proposal writing, project schedule, bid price proposal, Quiz #1, assignment I-2 due.
5	9/22/2025	I	Technical proposal presentations, assignments I-3 and I-4 due.
6	9/29/2025	II	Project Development & Environment (PD&E) development introduction, right of way review, utilities coordination
7	10/6/2025	II	Pond siting, preliminary engineering, pavement design, typical sections, assignment II-1 due.
8	10/13/2025	II	Pond siting, preliminary engineering, pavement design, typical sections, Quiz #2, assignment II-2 due.
9	10/20/2025	II	Pond siting, preliminary engineering, pavement design, typical sections, assignments II-4 and II-5 due.
10	10/27/2025	II	PD&E presentations, assignments II-3 and II-6 due.
11	11/3/2025	III	Traffic data and signalized intersection analysis, roadway conceptual plan preparation
12	11/10/2025	III	Highway drainage analysis, culvert and ditch design, assignment III-1 due.
13	11/17/2025	III	Stormwater management facility design, Quiz #3, assignment III-2.
14	11/24/2025		Thanksgiving - no class
15	12/1/2025	III	Preliminary design presentations, assignments III-3 and III-4 due.
15	12/3/2025		Class end – no class

Important Dates

Date	Assignments*
9/8/2025	Geotech Review Due
9/15/2025	Sustainable Pavement Review Due, Quiz #1
9/22/2025	Technical Proposal Due, Presentations
10/13/2025	Pond Siting Report Due, Quiz #2
10/20/2025	Pavement Design Package and Typical Sections Due
10/27/2025	Preliminary Engineering Report Due, Presentations
11/17/2025	Conceptual plans Due, Quiz #3
12/1/2025	Drainage Design Report Due, Presentations

*For other assignment due dates, refer to Canvas

Attendance Policy, Class Expectations, and Make-Up Policy

Because of the limited number of class meetings and the multi-disciplinary team nature of this course, each student is expected to attend every class, and effectively use the class time to identify, assign and coordinate work assignments and effort among the team members. Any presentation that is not presented on the scheduled date will receive a zero. Late assignments and reports will lose 5 points for each day late. Assignments/reports will not be allowed to be submitted after two days and will receive a zero point, unless the submission deadline is extended. Individual assessments are conducted through in-class quizzes and attendance.

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. Click here to read the university attendance policies:

<https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>

Evaluation of Grades

Phase	Task(s)	Total Points	% of Final Grade
Phase I – Proposal Writing	Four assignments, including a presentation	100	10%
Phase II – PD&E Development	Six assignments, including 2 reports and a presentation	100	40%
Phase III – Preliminary Design	Four assignments, including 1 report and a presentation	100	30%
Individual Assessment	Three in-class quizzes	100	10%
Team Participation	Groupwork participation and grades (instructor), individual teamwork evaluations (students)	100	10%

Grading Policy

Percent	Grade	Grade Points
100 – 94	A	4.00
< 94 – 90	A-	3.67
< 90 – 87	B+	3.33
< 87 – 84	B	3.00
< 84 – 80	B-	2.67
< 80 – 77	C+	2.33
< 77 – 74	C	2.00
< 74 – 70	C-	1.67
< 70 – 67	D+	1.33
< 67 – 64	D	1.00
< 64 – 61	D-	0.67
< 61 – 0	E	0.00

More information on UF grading policy may be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Students Requiring Accommodations

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Course Evaluation

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluer.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

In-Class Recording

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without the permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third-party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

University Honesty Policy

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code (<https://sccr.dso.ufl.edu/process/student-conduct-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Commitment to a Safe and Inclusive Learning Environment

The Herbert Wertheim College of Engineering values varied perspectives and lived experiences within our community and is committed to supporting the University’s core values, including the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of race, creed, color, religion, age, disability, sex, sexual orientation, gender identity and expression, marital status, national origin, political opinions or affiliations, genetic information, and veteran status.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:

- Your academic advisor or Undergraduate Coordinator
- HWC OE Human Resources, 352-392-0904, student-support-hr@eng.ufl.edu
- Pam Dickrell, Associate Dean of Student Affairs, 352-392-2177, pld@ufl.edu
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-6744, nishida@eng.ufl.edu

Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: <https://registrar.ufl.edu/ferpa.html>

Campus Resources:

Health and Wellness

U Matter, We Care:

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center: <https://counseling.ufl.edu>, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Discrimination, Harassment, Assault, or Violence

If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the **Office of Title IX Compliance**, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

Sexual Assault Recovery Services (SARS)

Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or <http://www.police.ufl.edu/>.

Academic Resources

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu.
<https://elearning.ufl.edu/>.

Career Connections Center, Reitz Union, 392-1601. Career assistance and counseling; <https://career.ufl.edu>.

Library Support, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with or find resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.
<https://academicresources.clas.ufl.edu/about-us/contact-information/>

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers.
<https://writing.ufl.edu/writing-studio/>.

Student Complaints Campus: <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>; <https://care.dso.ufl.edu>.

On-Line Students Complaints: <https://distance.ufl.edu/getting-help/>; <https://distance.ufl.edu/state-authorization-status/#student-complaint>.

Academic policies and resources: <https://go.ufl.edu/syllabuspolicies>