Solid Waste Containment Design (ENV 4300)

Advanced Solid Waste Containment (ENV 6301)

Class Periods:

Tuesday 2nd & 3rd Period (8:30am to 10:25am)

Thursday 2nd Period (8:30am to 9:20am)

Location: Larsen Hall, Room 310 & Online

Academic Term: Fall 2021

Instructor:

Steven Laux, P.E., ENV SP

Steven.Laux@essie.ufl.edu

(352)871-7069

Office Hours: By appointment at office or via Zoom. I am available Tuesdays & Thursdays after 2pm, and most times Mondays, Wednesdays and Fridays. Send me an email to request a meeting for a specific time and I will respond quickly.

Office Location: Sustainable Materials Management Research Laboratory (SMMRL), Room 105. The address is 2320 Surge Area Drive (Building 226). [SMMRL location map]

Course Description

Design fundamentals of solid and hazardous waste landfills, waste piles, monofills and surface impoundments. Regulations, site requirements, sizing, settlement analysis, liner design, leachate and gas management system design, operations and closure. *Three Credits*

This course provides detailed instruction on the design of solid waste containment units (primarily landfills, but also surface impoundments and waste piles). Elements of landfill design include mass balance principles, sizing, foundation design and basic soils engineering, liner design, leachate system design, landfill gas system design, and final landfill closure design. This class will consist of a mixed group of undergraduate and graduate students.

This course is designed and instructed in a manner that requires students to prepare for class prior to scheduled meetings. Class lectures are posted on Canvas in a series of modules. Lecture formats include both PDF and SWF files. Students will be assigned assessments and fundamental numerical calculations as part of the on-line Canvas platform. It is the student's responsibility to identify assignments and due dates/times, and to complete these prior to class. The purpose of

the class meeting times is to work problems and discuss (and present) the progress of the landfill design projects (guest speakers will also occasionally address the class). Each student will be assigned to a group, and each group will be responsible for the design a landfill. This landfill design project will be accomplished over several stages throughout the semester. Details of the design project and the groups will be provided during the first in-class meeting session.

Course Pre-Requisites / Co-Requisites

Pre-requisites: ENV4351 (Solid & Hazardous Waste Management)

Co-requisites: ENV4561 (Hydraulic Systems Design) or CWR 4202 (Hydraulics)

Course Objectives

The student will gain an understanding of the design process, be able to work in teams on a collaborative design effort and design the fundamental components of solid waste containment units. The student will also gain leadership skills by taking turns managing completion of deliverables, performing peer assessments and preparing invoices for their design effort.

Materials and Supply Fees

None

Professional Component (ABET):

This class provides 3 credits towards engineering topics and includes a design component.

Relation to Program Outcomes (ABET):

Outcome	Coverage[*]
1. An ability to identify, formulate, and solve engineering problems by applying principles of engineering, science, and mathematics.	
2. An ability to apply both analysis and synthesis in the engineering design process, resulting in designs that meet desired needs.	High
3. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.	Medium
4. An ability to communicate effectively with a range of audiences	High
5. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which	High

must consider the impact of engineering
solutions in global, economic, environmental,
and societal contexts.

6.   An ability to recognize the ongoing need
for additional knowledge and locate, evaluate,
integrate, and apply this knowledge
appropriately.

7.   An ability to function effectively on teams
that establish goals, plan tasks, meet deadlines,
and analyze risk and uncertainty

[*]Coverage is given as high, medium, or low. An empty box indicates that this outcome is not covered or assessed in the course.

Required Textbooks and Software

Course notes will be provided by the instructor through Canvas. These materials include recorded lectures that use Flash Player, which is no longer supported by Adobe. You will need to download [Flash Player Projector](#) to view these lectures.

Recommended Materials

Waste Management Principles and Practice: Sustainable Practices for Landfill Design and Operation

Townsend, Powell, Jain, Xu, Tolaymat and Reinhart

2015

ISBN 978-1-4939-2661-9

Course Schedule

Follow link to [Course Calendar](#)

Attendance Policy, Class Expectations, and Make-Up Policy

This is a registered in-person class that will be taught primarily in the face-to-face mode in Larsen Hall, Room 310 at the scheduled times listed above. The class will employ Zoom through Canvas to provide synchronous remote access to face-to-face classroom meetings. Students may elect to attend class either face-to-face or virtually over Zoom at the regularly scheduled times. Full credit for participation and assignments is available either way. Recordings will be made available through Canvas shortly after the live classes.

Successful engineering projects require effective teamwork. Effective teamwork require good leadership and communication, and will only occur if individuals act responsibly by being

punctual, attend all team meetings and complete their assignments on-time.   The instructor will adjust group project grades for individual team members based on project manager evaluations. Excused absences must be consistent with university policies in the undergraduate catalog (https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx) and require appropriate documentation.

Grades

Grading for this course will be based on successful completion of the on-line assessment and design calculations, the design projects. The grade distribution is described below. Note that some part of your grade will be based on an instructor evaluation (items such as class attendance and punctuality; participation; attendance of any scheduled field trips; and the professionalism you show your instructor and your fellow students; please be courteous of others in the class; talking during the lecture or other disruptive behavior (texting) is not appreciated). Students in a graduate section will be assigned a separate assignment to complete.

Grading Policy

Percent	Grade	Grade Points
93.4 - 100	A	4.00
90.0 - 93.3	A-	3.67
86.7 - 89.9	B+	3.33
83.4 - 86.6	B	3.00
80.0 - 83.3	B-	2.67
76.7 - 79.9	C+	2.33
73.4 - 76.6	C	2.00
70.0 - 73.3	C-	1.67
66.7 - 69.9	D+	1.33
63.4 - 66.6	D	1.00
60.0 - 63.3	D-	0.67
0 - 59.9	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.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

Online Course Recording

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

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 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/policies/student-honor-code-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 in this class.

Commitment to a Safe and Inclusive Learning Environment

The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

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 Graduate Program Coordinator
- Jennifer Nappo, Director of Human Resources, 352-392-0904, jpennacc@ufl.edu
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, 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: http://www.counseling.ufl.edu/cwc, 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/.

COVID-19

- You are expected to wear approved face coverings at all times during class and within buildings even if you are vaccinated.
- If you are sick, stay home and self-quarantine. Please visit the UF Health Screen, Test & Protect website about next steps, retake the questionnaire and schedule your test for no sooner than 24 hours after your symptoms began. Please call your primary care provider

if you are ill and need immediate care or the UF Student Health Care Center at 352-392-1161 (or email covid@shcc.ufl.edu) to be evaluated for testing and to receive further instructions about returning to campus.

- If you are withheld from campus by the Department of Health through Screen, Test & Protect, you are not permitted to use any on campus facilities. Students attempting to attend campus activities when withheld from campus will be referred to the Dean of Students Office.
- UF Health Screen, Test & Protect offers guidance when you are sick, have been exposed to someone who has tested positive or have tested positive yourself. Visit the UF Health Screen, Test & Protect website for more information.
- Please continue to follow healthy habits, including best practices like frequent hand washing. Following these practices is our responsibility as Gators.

Academic Resources

E-learning technical suppor*t*, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. https://lss.at.ufl.edu/help.shtml.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. https://www.crc.ufl.edu/.

Library Support, http://cms.uflib.ufl.edu/ask. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. https://teachingcenter.ufl.edu/.

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*:* http://www.distance.ufl.edu/student-complaint-process.