Specialized Off-Highway Vehicles
Section 28588 (<u>only</u>) of EML 6934
MWF 4th period (10:40-11:30)
FLG (Florida Gym) 260
Fall 2024

Instructor:
Prof. John K. Schueller
schuejk@ufl.edu
322 MAE-B, 352-392-0822 (the answering machine is defective, so email)
Office Hours: MW 1:30-2:30 tentative

Teaching Assistant/Peer Mentor/Supervised Teaching Student:
None. One may be appointed at a later date.

Course Description
Practical mechanical engineering design studied through the design of off-highway vehicles, particularly agricultural tractors.

Course Pre-Requisites / Co-Requisites
Graduate standing or instructor permission.

Course Objectives
To apply engineering analysis tools to practical design situations
To learn by example the use of empirical knowledge and specialized procedures in engineering design
To learn the current state-of-the-art in off-highway vehicle design, emphasizing agricultural tractors
To apply what you learned in this course in a paper on an off-highway vehicle which is not an ag tractor

Required Textbooks and Software
Karl Th. Renius, 2020. *Fundamentals of Tractor Design*. Springer. ISBN:978-3-030-32803-0.
(Must have a <u>hardcopy</u> for open-book exams.)

Course Schedule
Every cohort of students is different. Every semester is different. Sometimes I can go faster and sometimes I have to go slower. As this is only the third time this course will be taught, I will try to improve it during the semester. Sometimes there is new, exciting state-of-the-art material to add. You deserve something better than a fixed schedule. We will cover significant portions of the first eight chapters in the order they appear in the textbook. Guest lectures and I will also intersperse other contemporary information.
There will be exams after approximately the 1/3 and 2/3 points in the class. I will survey the class for competing exams and will announce the exams at least a week in advance. There will be frequent homework.

Topics (Textbook Chapters. Chapters 1 to 5 emphasized.):
1. Mission, history, trends, markets, and costs
2. Tractor mechanics
3. Chassis design
4. Diesel engines
5. Tractor transmissions
6. Tractor workplace
7. Tractor and implement
8. Tractor tests
   (Some Other Topics Likely to Be Discussed in Lectures and Guest Lectures)

a. Vehicle electrification
b. Vehicle automation and autonomy
c. International and multinational vehicle engineering
d. Some concepts for other vehicles (excavators, off-road trucks, lawn tractors, ATV's, bulldozers, etc.)
e. Shared technologies and differences with on-highway vehicles

Notes:
- The off-highway vehicle of focus in this course will be the contemporary agricultural tractor used in developed countries, as described in the textbook. However, the technologies and techniques learned will generally be applicable to other off-highway and on-highway vehicles. Components and systems used on various types of vehicles will sometimes be compared and contrasted. Every industry has its own set of market influences, experiences, rules of thumb, experimental data, historical inertia, standards, firms and enterprises, etc., which together form an integrated engineering ecosystem. The main purpose of this course is to show you, by example, how engineering knowledge can be integrated in an example industry.
- You will share lectures, homework assignments, and exams with the students in the undergraduate class EML 4285. However, you have an additional project paper and some additional homework problems appropriate for graduate students. You will be graded separately.
- The final exam will not be given early, but at the Registrar-assigned time: **Tuesday 10 December 10:00-noon**. Please make your winter break plans accordingly.

Attendance Policy, Class Expectations, and Make-Up Policy
You are now engineering graduates and professionals and expected to exhibit professional behavior and responsibility. You may attend the lectures or not as you see fit. However, you are responsible for everything covered in lectures, in the assigned readings, and any other communications.
You must turn in homework at their due dates and times and take the exams at the required times. If there is a problem for serious and justifiable reasons, please communicate with me as soon as possible and we will see if an arrangement can be made.

This statement is required:
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

Assignment	Percentage of Final Grade
Homework Sets	10%
Midterm Exams (2)	50%
Final Exam	25%
Final Project Paper	15%
Total	100%

Grading Policy

Percent	Grade	Grade Points
93 - 100	A	4.00
90 - 93	A-	3.67
87 - 90	B+	3.33
83 - 87	B	3.00
80 - 83	B-	2.67

77 - 80	C+	2.33
73 - 77	C	2.00
70 - 73	C-	1.67
67 - 70	D+	1.33
63 - 67	D	1.00
60 - 63	D-	0.67
0 - 60	E	0.00

More information on UF grading policy may be found at:
UF Graduate Catalog
Grades and Grading Policies

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/.

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.

Note: Subsequent to the publishing of this syllabus, there were very minor changes in the boilerplate. Please see https://www.eng.ufl.edu/faculty/wp-content/uploads/sites/42/2024/08/HWCOE-Grad-Course-Syllabus-Fall-2024-v0801-post.docx for details.

Campus Resources:

> **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.
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> **Counseling and Wellness Center:** https://counseling.ufl.edu, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.
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> **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 suppor***t*, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. https://lss.at.ufl.edu/help.shtml.
>
> **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 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***: https://distance.ufl.edu/state-authorization-status/#student-complaint.*