

Off-Highway Vehicle Design
EML 4930 Sections 26663 and 27141
Class Periods: MWF 9th (4:05-4:55) online
Academic Term: Fall 2020

Instructor:

Prof. John K. Schueller
schuejk@ufl.edu
Office Hours: MW 1:30-2:30

Teaching Assistant/Peer Mentor/Supervised Teaching Student:

Although this is a large course, no assistant was assigned.

Course Description

Engineering is a very diverse field with employment opportunities in very many industries. Our design classes need to be fundamental, broad, and general. They are not focused on a certain industry. However, individual industry segments have specialized procedures, empirical knowledge, “rules of thumb”, and standard ways of doing things. This course will use the example of agricultural tractor design to illustrate applied mechanical machine design. Prof. Karl Renius, a retired ME professor from the Technical University of Munich and unquestionably the world’s top expert on agricultural tractor design, has used his retirement to write the definitive book on tractor design and Springer has just published it. We will cover major portions of the book in this class.

Course Pre-Requisites / Co-Requisites

This is intended for students wanting an elective in mechanical machine design, especially if interested in the various automotive industries. Students must be willing to study agricultural tractor design knowing that the concepts might be similar, not exactly the same, in other industries. This is an elective engineering course in most majors. (Please contact your advisor if unsure.)

Course Topics (Textbook Chapters)

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

(I will also add some additional materials of my choosing. Some will draw comparisons to other automotive industries.)

Materials and Supply Fees

None

Relation to Program Outcomes (ABET):

As this is an elective, it probably should not be expected to provide accreditation requirements coverage. Nevertheless, this course will help meet outcomes as follows:

Outcome	Coverage*
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	High
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare,	High

as well as global, cultural, social, environmental, and economic factors	
3. An ability to communicate effectively with a range of audiences	
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	Medium
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	
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	Medium

Required Textbooks and Software

Students must buy a printed hardcopy (open book exams demand NO e-book) of Karl Th. Renius, 2020. *Fundamentals of Tractor Design*. Springer. ISBN:978-3-030-32803-0.

There is no software required.

Students will be required to read or view some items on the internet, in Canvas, or sent via email.

Recommended Materials

None

Course Schedule

One of the reasons you take a course with a live instructor rather than something pretaped is to take advantage of flexibility. Every cohort of students is different and I can adapt the course slightly to your needs and wants. In addition, there may be new information I may want to give you. Hence, it would be stupid for me to give you an exact schedule. It would be really stupid in a course like this which is being offered for the first time. If you have trouble with a subject, we can spend more time. If you master a subject quickly, we can move on rather than bore you.

In general, we will follow the order of the chapters in the textbook. Of course, there is no way we could cover the whole textbook. So I will tell you portions to skip and portions to skim in the chapters, as well as that which I would like you to master. So you need to pay attention to organizational statements in lecture and in emails.

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.

Attendance Policy, Class Expectations, and Make-Up Policy

The class will be taped period 9 on MWF on Zoom in Canvas. Live attendance is encouraged so you can ask questions or give input. Such attendance is NOT required nor is absence penalized. However, unless approved by me, you must take two during-semester exams and the final exam at their designated times. I will be fairly generous in those approvals for legitimate work and family reasons. UF requires this statement: "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."

Evaluation of Grades

Assignment	Total Points	Percentage of Final Grade
Homework Sets (unknown number)	10 each	10%
Midterm Exams	100 each	60%
Final Exam 3:00 Monday 14 December	100	30%
		100%

Grading Policy

Percent	Grade	Grade Points
93	A	4.00
90	A-	3.67
87	B+	3.33
83	B	3.00
80	B-	2.67
77	C+	2.33
73	C	2.00
70	C-	1.67
67	D+	1.33
63	D	1.00
60	D-	0.67
Below 60	E	0.00

Note the above are minimum averages. (E.g., 89.999999999 is a B+)

All exams will be conducted using Honorlock. The exams will allow you to use anything on paper (books, notes, Xeroxed or printed materials, etc.). You will be allowed to use calculators, but no other electronic devices. Computers and cell phones are included in that exclusion. (So you will want a hardcopy of the textbook, since you will not be able to share it or any other materials during the exams.)

The two midterm exams will be conducted during regular class periods. You will be given at least ten days prior notice of the exam dates. The final exam will be 3:00 – 5:00 p.m. on Monday 14 December. Please note that the final exam will NOT be given early. So make your December plans accordingly.

There will be some homeworks. You must do the first homework to pass the course.

You are expected to regularly check your Gatorlink (@ufl.edu) email. Announcements of assignments, exam dates, and other matters may be made by listserv emails to that address.

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/>.

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 or TAs in this class.

All homeworks you submit must be your own work. You may not copy or submit anyone else’s work or provide work to anyone else. Use of internet sources such as Chegg, Course Hero, etc., are included in this prohibition. Any cheating on homework or exams will be treated harshly and taken to the Honor Court.

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
- Robin Bielling, Director of Human Resources, 352-392-0903, rbielling@eng.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

EML 4930: Off-Highway Vehicle Design
Prof. John K. Schueller

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/>.

Academic Resources

E-learning technical support, 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://care.dso.ufl.edu>.

On-Line Students Complaints: <http://www.distance.ufl.edu/student-complaint-process>.

Please Note:

This course has never been taught before. So I may need to modify it as the semester proceeds. But I anticipate I will approximately follow the textbook.

You will share lectures, exams, and many homeworks with the graduate students taking the EML 6934 version of this course. They will have a few more-advanced homeworks and a final project that you will not do.

You will have to be able to use Canvas, Zoom, and Honorlock.