

Lightning EEL 4495 Section  
and

Lightning EEL 5490 Section

Class Periods: Monday, Wednesday, Friday, 4<sup>th</sup> Period, 10:40 am to 11:30 am

Location: Room 0327 MAEA

Academic Term: Spring 2020

Instructor: Martin A. Uman

[uman@ece.ufl.edu](mailto:uman@ece.ufl.edu)

Office Phone 352-392-4038

Office Hours: 11:40 am to 12:30 pm, or by appointment, 311 Larsen Hall

Faculty Support for Dr. Uman: Ms. Waleta Newman, 313 Larsen Hall

[wsnewman@ece.ufl.edu](mailto:wsnewman@ece.ufl.edu)

Course Description: Introduces lightning discharge processes. Electromagnetics relevant to lightning measurements, application for determining lightning charge, current, location and characteristics. Lightning protection. 3 credit hours

Course prerequisites: EEL 3472C is required for course EEL 4495

1. Required Text: Rakov, V. A., Fundamentals of Lightning, Cambridge University Press, 2016

Reference Text: J. R. Dwyer and M. A. Uman, The Physics of Lightning, Physics Reports 534 (2014) pp. 147-241, <http://dx.doi.org/10.1016/j.physrep.2013.09.004>

Reference Text: V. A. Rakov and M. A. Uman, Lightning Physics and Effects, Cambridge University Press, 2003, available in the office of M.A. Uman, 311 Larsen Hall

Reference Text: M. A. Uman, The Art and Science of Lightning Protection, Cambridge University Press, 2008, available in the office of M. A. Uman, 311 Larsen Hall

2. Course Outline:

- i) Types of lightning discharges and lightning terminology – 3 hrs
- ii) Incidence of lightning to areas and structures – 3 hrs
- iii) Electrical structure of thunderstorm clouds – 3 hrs
- iv) Properties of the negative lightning discharge to ground – 6 hrs
- v) Calculation of lightning electromagnetic fields – 4 hrs
- vi) Modeling of lightning processes – 4 hrs
- vii) Measurement of lightning electric and magnetic fields – 3 hrs

- viii) Lightning locating systems – 3 hrs
- ix) Deleterious effects of lightning and protective techniques – 3 hrs

### 3. Grading

Hour tests, probably 3 or 4, will be given during lecture periods. The hour tests, in total, will count for 40% of the final grade. There may be take-home tests in place of one or more hour tests. The final exam will nominally count for the other 50% (or a greater percentage if the results are significantly better than the hour tests of the total grade). 10% credit will be given for homework. All in-class tests will be closed book with one personal handwritten sheet of notes allowed and turned in as part of the test. For the final exam two sheets of notes will be allowed.

Final Exam is April 29, 2020, 3:00 p.m. to 5:00 p.m. in MAEA-0327

More information on UF grading policy may be found at: <https://catalog.ufl.edu/graduate/regulations/>

#### ***Students Requiring Accommodations***

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://www.dso.ufl.edu/drc>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure 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.

### ***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](mailto:rbielling@eng.ufl.edu)
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, [taylor@eng.ufl.edu](mailto:taylor@eng.ufl.edu)
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, [nishida@eng.ufl.edu](mailto: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](mailto: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](mailto: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>.