Course Syllabus: AT780 Atmospheric Electricity, Spring 2017

Course Name: Atmospheric Electricity

Instructor: Prof. Steven A. Rutledge, 307 ATS, 970 491 8283;
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Instructor web page: radarmet.atmos.colostate.edu/AT780

Office hours: To be arranged with the instructor

Classroom and meeting time: 212 ACRC, Tue/Thur 11:00 – 11:50 AM

Prerequisites: AT620, Thermodynamics and Cloud Physics

Course goals and objectives: AT780 is intended to provide a foundational understanding of atmospheric electricity. The course is intended to provide an understanding of the global electric circuit and the role of thunderstorms in maintaining this circuit, thunderstorm electrification processes based on non-inductive charging theory, lightning detection based on RF and optical sensing, lightning phenomena including Transient Luminous Events,

Textbook: None

Course readings: As provided during the semester, also see course web page.

Course calendar: Follows CSU spring 2017 semester schedule

Expectations: Regular attendance is required. Students will be expected to participate in class discussions. Students will also be assigned occasional papers to present in class.

Statement on academic dishonesty: This course will adhere to the CSU Academic Integrity Policy as found in the General Catalog (http://www.catalog.colostate.edu/FrontPDF/1.6POLICIES1112f.pdf and the Student Conduct Code http://www.conflictresolution.colostate.edu/conduct-code At a minimum, violations will result in a grading penalty in this course and a report to the Office of Conflict Resolution and Student Conduct Services.

Exam schedule: To be announced during the semester

Grading policy: Course grade will be based on several in class presentations (75%) plus a final project due at the end of the semester (25%).

Contact hours: Approximately two hours of effort are expected to complete readings and prepare paper reviews for each hour of class time.

GTA information: There is no course GTA.

Course content: Lightning and climate change; the global electric circuit; electrical properties of the atmosphere; thunderstorm charge structures and charging mechanisms; lightning mapping and detection via RF and optical sensing; the GLM lightning mapper; radar-based lightning detection and associated theory; Transient Luminous Events; lightning in tropical cyclones and its relation to intensification; lightning in relation to sever weather; lightning in winter storms; production of NOx by lightning.