The exam will be a close book exam. Exam composition: 60% multiple choice (40 questions, 1.5 points each); 40% sketch, draw and explain, or brief essay (chose 4 out of 5 questions). You will have 75 minutes. We will begin promptly at 11:00AM. Bring pencils and erasers.

LECTURE 13: East Coast & Gulf Coast Cyclones
1. What is cold air damming? In which regions does this occur? (Slide #11)
2. What is the cold/warm air boundary prior to the formation of an East Coast cyclone? (slide #10)
3. Rapidly deepening of Gulf Coast cyclone with an East Coast storm track: explain contributing factors (slide #21)
4. During the most intense stage of a Gulf Coast cyclone with an East Coast storm track, which feature is associated with the heaviest snowfall? (slide #22)

LECTURE 16: Freezing precipitation
1. What is supercooled water? (slide #3)
2. Weather patterns (fronts) that produce freezing rain: slide #8-12.

LECTURE 17: Lake effect snowstorms
4. Physical basis of lake effect snow: vertical cross section in slide #6. Part II question.
5. Topography effect (slide #13) Part II question.
6. Along which shores of the great lakes does the lake-effect snow typically occur? slide #6-7.
7. Three types of organization of lake effect snowfall (slides #15-22)

LECTURE 18: Cold waves
8. Weather pattern associated cold waves: center pressure, location of cold ridge, the role of East Coast cyclones in the development of cold waves): slides #4-11

LECTURE 19: Blizzards
9. Definition and ingredient of blizzard: Slides #2 &5
10. Two types of cyclones that can cause blizzard (slide 7-9, &14-16)
11. Weather pattern for blizzards associated with a Colorado Cyclone (slides #7, 8,9) Part II question.
12. Topography effect (slide 12) Part II question.

LECTURE 20: Mountain snowstorms:
13. Why are radars not very useful in determining snowfall totals in mountains: slide #7
14. The order of mountain ranges from the west coast over which air passes as it moves eastward: slide 11 &18
15. What is upslope storm? Slide 20.

LECTURE 21: Mountain windstorms:
16. What are Chinook winds and where do they occur? slide #2-3
17. How does a shooting flow occur? slide #15.
18. Factors that determine the temperature of air in downslope windstorms: slide 16.

LECTURE 22-25: Air-mass thunderstorms, MCS, frontal squall lines, and supercells
19. Conditions to prevent widespread afternoon seabreeze thunderstorms in south FL: Lec 23, slide 3-4
20. Definition of MCS: lec 23, slide 11
21. Why the elevated mixed layer is important for supercell development? Lec 25, slide 3-5.
22. Key ingredients to form supercells. Lec. 25, slide 2
LECTURE 26-29: Tornadoes
25. Three steps of tornadogenesis within supercell thunderstorms; three proposed mechanisms for the last step:
27. Tornadoes’ life time, size & the percentage of all tornadoes that occur in the US: Lec 26, slide 5
28. Two important processes for supercell rotation development: tilting and stretching: Lec 27, slide 5 &7.
30. What is a tornado family? Lec. 26: slide 27
31. Definitions of gustnado, dust devil, landspout, waterspout, & cold air funnel: lec 27, slide 6-14.
32. Which US state has the most tornadoes per 10,000 square mile area? Lec. 29 slide 5
33. Which US state has the largest number of violent tornadoes? Lec 29, slide 6 &13
34. What time of the day & what time of the year is a strong tornado most likely to occur? Lec 29, slide 14-15
35. How to locate a tornado using radar fields: debris ball, hook echo, and mesocyclone signature Lec. 29 slides 28-30.