The applications of various statistical methods pervade the atmospheric sciences. From simple descriptive techniques to more complex analyses, meteorologists and climatologists routinely rely on statistical methods and procedures to draw conclusions about physical processes in the atmosphere, to analyze historical data, to forecast the weather, and to verify those forecasts. No matter what you plan to accomplish after you earn your degree from UNC Asheville, you will certainly benefit from a broad knowledge of the statistical methods used in the atmospheric sciences.

PROFESSOR
Dr. Christopher Godfrey
Office: Robinson Hall, room 236B
Phone: 828-232-5160
E-mail: cgodfrey at unca dot edu
Office hours: Via virtual meetings through Google Meet on Wednesdays and Thursdays 11:15 a.m.–12:15 p.m., or by appointment. You may call my office (it bounces to my cell phone) during regular business hours. You may send me as many email messages as you wish. Check Moodle or my office door for the Google Meet link.

CLASS INFORMATION
Meeting times: TR 3:15–4:30 p.m.
Location: Robinson Hall, room 238
Website: http://www.atms.unca.edu/cgodfrey/courses/atms405/

GETTING QUESTIONS ANSWERED
I will be available on Google Meet during scheduled office hours. Just drop in. If at any other time you have a question, you are more than welcome to call me or send me an email. E-mail is by far the best way to reach me and you will usually get a speedy reply. You may also schedule an appointment with me for an in-person or virtual meeting. Please don’t hesitate to ask questions about class, other coursework, or the stresses of college life whenever the need arises.

IMPORTANT DATES
Thursday, 2 March 2023 Midterm Exam 3:15–4:30 p.m.
Tuesday, 2 May 2023 Final Exam 11:30–2:00 p.m.

COURSE OUTLINE
This course outline is approximate, but the list of topics and corresponding book sections serves as an excellent schedule of reading assignments. (Important note: Section numbers correspond with the 3rd edition of the textbook.)

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Reading</th>
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</thead>
<tbody>
<tr>
<td>10 January</td>
<td>Introduction, Probability</td>
<td>Chapter 1</td>
</tr>
<tr>
<td>12 January</td>
<td>Probability</td>
<td>Chapter 2</td>
</tr>
<tr>
<td>17 January</td>
<td>Probability</td>
<td>Chapter 2</td>
</tr>
<tr>
<td>19 January</td>
<td>Guest lecture</td>
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<tr>
<td>24 January</td>
<td>Exploratory data analysis, Organizing data</td>
<td>3.1–3.2</td>
</tr>
<tr>
<td>26 January</td>
<td>Exploratory data analysis, Organizing data</td>
<td>3.3–3.4, except 3.3.6</td>
</tr>
<tr>
<td>31 January</td>
<td>Exploratory data analysis, Organizing data</td>
<td>3.3–3.4, except 3.3.6</td>
</tr>
<tr>
<td>2 February</td>
<td>Correlation</td>
<td>3.5–3.6</td>
</tr>
<tr>
<td>7 February</td>
<td>Discrete distributions</td>
<td>4.1–4.3</td>
</tr>
<tr>
<td>9 February</td>
<td>Discrete distributions</td>
<td>4.1–4.3</td>
</tr>
<tr>
<td>14 February</td>
<td>Continuous distributions</td>
<td>4.4–4.5</td>
</tr>
<tr>
<td>16 February</td>
<td>Continuous distributions</td>
<td>4.4–4.5</td>
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</tbody>
</table>
21 February  Sampling distributions, Testing 5.1
23 February  Parametric tests 5.2
28 February  Parametric tests 5.2
2 March      Midterm Exam
7–9 March    Spring Break–No Class
14 March     Mid-term review
16 March     Nonparametric tests 5.3
21 March     Nonparametric tests 5.3
23 March     Field significance, False discovery rate 5.4
28 March     Least squares regression 7.1–7.2
30 March     Least squares regression 7.4
4 April      Classical statistical forecasting, MOS, Perfect prog 7.3.2, 7.5
6 April      Ensemble forecasting 7.6-7.7
11 April     Ensemble forecasting, Subjective probability forecasting 7.8
13 April     Forecast verification (nonprobabilistic) 8.1–8.3
18 April     Undergraduate Research Symposium–No Class
20 April     Forecast verification (probabilistic) 8.4–8.5
25 April     Forecast verification (field, ensemble) 8.6, 8.7
2 May        Final Exam 11:30–2:00 p.m.

EVALUATION
There will be homework assignments, one midterm exam, and one comprehensive final exam to assess your newfound
knowledge of statistics. Expect about eight homework assignments, which will be due every one to two weeks as we make
sufficient progress through the course. Homework is due at exactly 5:00 p.m. on the scheduled due date. Please plan
accordingly. I will accept homework up to 24 hours late (5:00 p.m. the following calendar day) for a 50% late penalty.
Homework more than 24 hours late will not be graded.

GRADING

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Homework Assignments</td>
<td>50%</td>
</tr>
<tr>
<td>Midterm Exam</td>
<td>25%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>25%</td>
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</tbody>
</table>

I reserve the option to curve the final grades upward at my discretion. In fact, it is highly likely that I will do so by applying
statistical techniques. I also reserve the right to adjust the percentages shown here, but only if doing so would benefit the
class as a whole.

ACADEMIC INTEGRITY
Since the point of this or any class is to learn, you may collaborate on homework assignments, but you absolutely must
make sure that you hand in your own work. If you choose to use a data analysis package, such as Excel, then you may not
share worksheets, nor may you share R or Python code. Please enter any necessary data, formulae, or code and create
charts on your own. Copying your friend’s answers will not only be obvious to me, but will result in both of you sharing
the credit for that answer. For example, if you do a fantastic job on the homework assignment and then let three of your
friends copy any part of it, you will each receive a maximum grade of 25% for the assignment. The midterm and final
exams are open book and open notes, but you may not consult classmates or use your phone, supplemental materials, or
the Internet.

NOTES
Students with disabilities who require accommodations in this course are requested to speak with the professor as early
in the semester as possible. Students requiring reasonable accommodations must register with the Office of Academic
Accessibility by providing supporting documentation. The Office of Academic Accessibility is located in the OneStop
Student Services Center, 011 Ramsey Library, phone (828) 232-5050.

FURTHER NOTES
- Those who are graduating this semester may not take the final exam at a different time.
- Some homework problems will require plots or analyses that a program or software package may handle best. You are
  welcome to learn and use any available package or programming language (e.g., Excel, Python, Matlab, RStudio, SAS,
COVID-19 ADDENDUM

Though there is currently no mask mandate in UNC Asheville classrooms, a deadly virus is still prevalent in our community. If you are feeling ill, or if there is any reason to suspect that you may have been exposed to someone who is sick, please **DO NOT COME TO CLASS**. There is no penalty for missing class if you are sick. I am happy to provide a recorded lecture video upon request. I ask for your patience and flexibility as we all navigate a global pandemic.

A conceptual illustration of a convective-scale warn-on-forecast system (NSSL, [http://www.nssl.noaa.gov/projects/wof](http://www.nssl.noaa.gov/projects/wof)).