FNR 3410C Natural Resource Sampling (3 Credits)
Course Syllabus - Fall 2021

INSTRUCTORS
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OFFICE HOURS & COMMUNICATION
Office hours are as arranged, or via phone/email. For general course questions: The preferred method of communication is by Canvas email. An instructor or teaching assistant will respond within 48 hours. For technical issues and questions regarding the navigation and use of Canvas: Contact the UF Help Desk online at helpdesk@ufl.edu or by phone (352) 392-HELP – select option 2. On occasion, we will send an email via Canvas regarding updates to the syllabus, clarifications of assignments, or changes in due dates. You should be checking your email on a regular basis.

PREREQUISITES
Statistics 2023

PURPOSE OF THE COURSE
Our ability to analyze and evaluate the environment around us requires effective data collection. Natural Resource Sampling examines the theory and techniques for sampling various characteristics of a variety of natural resources and attributes of the environments in which they are found. The course begins with a comprehensive review of elementary statistics and continues with specific applications of field sampling methods commonly used in forestry, fisheries, ecology, and wildlife management. In conjunction with learning various sampling methods, students will be exposed to a variety of analysis techniques and application of data obtained during laboratory sampling sessions. The techniques learned in this class will provide a foundation for more advanced labs in the other upper-division courses in the NRC major as well as provide supplemental instruction for those working in the natural resources field.

OBJECTIVES
By the end of the course, students should demonstrate an understanding of the following concepts and techniques:
- Statistical terminology and descriptive statistics
- Sampling theory and design
- Hypothesis testing; t-tests
- Forestry measurements, e.g. dbh, hts, basal area; fixed area and variable radius sampling
- Vegetation sampling methods - cover plots, line intercept and intersect methods
- Terrestrial and aquatic animal methods, e.g. double sampling, line transects, variable circular plots, point counts, recapture techniques, radio telemetry, fish sampling, depletion methods
- Environmental sampling, e.g. light, weather, basic soil and water
LEARNING OUTCOMES:
Upon successful completion of the course, students should:

- Demonstrate an understanding of the underlying theories upon which sampling methods and frequently used statistics are based
- Develop hypothesis and demonstrate application of proper experimental design to sampling of animals, plants, and environmental variables
- Demonstrate correct sampling methodology and use of equipment to collect animal, plant, and environmental data
- Compute basic descriptive statistics for animal, plant, and environmental data
- Use computers and software programs to analyze data
- Perform t-test and simple regression when appropriate to analyze data
- Prepare graphs and tables using computer software to summarize descriptive data and statistical analysis
- Write scientific reports to interpret, present, and explain results of data collection

COURSE FORMAT & PARTICIPATION
This is a 3-credit course, consisting of in-person class meetings (class will be conducted via synchronous online discussion until Sept. 13), recorded lectures, online discussion sessions, and off-campus field labs. Dr. Sharma will cover the material related to basic statistics and sampling theory, forest vegetation sampling, and environmental data (Modules/Weeks 1 – 8). Dr. Miller will cover the material related to wildlife, fish, and aquatic sampling (Modules/Weeks 9 – 15). Course materials (recorded lectures, assignments, quizzes, etc.) will be available through the Canvas e-learning site. https://elearning.ufl.edu/

Lecture recordings (where applicable) will be posted for each week in the respective Module in Canvas. Mandatory class meetings will occur on Tuesdays at 5:00 – 8:00 pm (Central) to discuss the lecture material and/or conduct outdoor mini labs. Mandatory field labs will occur off-campus on Saturdays throughout the semester (see Schedule below for dates) to reinforce and strengthen the concepts learned in class through hands-on activities.

The field labs will be conducted at several locations off-campus. Whenever field (outdoor) labs are scheduled, wear appropriate clothing (long pants and sturdy shoes) and bring water, sunscreen, and insect spray. Also, be prepared to take notes (clipboard, pen, and paper, or audio recorder) and pictures (if you have a camera). During the field lab students will practice techniques for properly handling equipment and collecting data. The data will be analyzed and presented in lab reports (see Description of Assignments below). Outdoor lab work is conducted as scheduled regardless of weather conditions. Never assume lab is canceled.

Students are expected to actively participate during the class meetings and/or online discussions. Where applicable, students must watch the recorded lectures and complete the weekly quiz (quizzes begin Week 9) before class on Tuesdays at 5 PM (Central). Also, be prepared to answer questions, perform calculations, and work on group activities. A web camera, a microphone, proper attire, and a distraction-free setting are all required during online discussion sessions.

Our online 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.
This class requires attendance/participation and there is grade associated with attendance. During online sessions, the instructor may randomly stop the recording for a few minutes and ask everyone to turn the webcams on to record attendance.

**CODE OF CONDUCT AND ONLINE ETIQUETTE**
It is important to recognize that the online classroom is in fact a classroom, and certain behaviors are expected when you communicate with both your peers and your instructors. Refer to the University’s Netiquette Guide for detailed tips on professional communication.

**REQUIRED MATERIALS**
There is no required text for the course, but an introductory statistics textbook may be useful. The instructors highly recommend “CliffsNotes Statistics Quick Review, 2nd Edition” as an inexpensive resource. Also, there are numerous resources available online to assist you with mathematical and statistical calculations.

Additionally, you can access an e-book useful for this course for free from the UF library catalog: Statistics for Terrified Biologists

Other references (available on short-term loan from the instructors) include:


**OTHER COURSE RESOURCES**
- LinkedIn Learning is a useful resource for help in Excel and other common software. It can be accessed by UF students for free at https://training.it.ufl.edu/linkedin/.
- For scientific literature, the “web of science” is available to students free of charge on campus or when connected by the campus VPN (virtual private network). http://apps.webofknowledge.com/WOS_GeneralSearch_input.do?product=WOS&search_mode=GeneralSearch&SID=6FczRdAxQteBV9qHAPA&preferencesSaved=
- To set up the VPN on your computer, go to https://it.ufl.edu/ict/documentation/network-infrastructure/vpn/anyconnect-installation--configuration-guide/

**GRADES AND GRADING SCALE**

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Point Value per Assignment</th>
<th>Total Points</th>
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</thead>
<tbody>
<tr>
<td>Homework Assignments and Quizzes</td>
<td>10 pt. each</td>
<td>130</td>
</tr>
<tr>
<td>Mini Lab Reports</td>
<td>20 pt. each</td>
<td>60</td>
</tr>
<tr>
<td>Full Lab Reports</td>
<td>50 pt. each</td>
<td>100</td>
</tr>
<tr>
<td>Exams</td>
<td>100 pt. each</td>
<td>300</td>
</tr>
<tr>
<td>Participation</td>
<td>N/A</td>
<td>60</td>
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<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>650</strong></td>
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Letter grades will be assigned as follows based on percent score:
A (93-100), A- (90-92), B+ (86-89), B (83-85), B- (80-82), C+ (76-79), C (73-75), C- (70-72), D+ (66-69), D (63-65), D- (60-62), E (<60)
A complete explanation of the UF Grading policies can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

ATTENDANCE AND MAKE-UP WORK
Students are required to attend online discussion sessions (via Zoom), in-person class meetings on campus, and off-campus fieldtrips. Excused absences and make-up work will be allowed when circumstances are beyond a student’s control (e.g. illness; see the University’s attendance policy for other acceptable reasons for absence), are reported to the instructor, and when possible documented (e.g. doctor’s note). In the case of an absence or missed exam, notify your instructor immediately, preferably beforehand. Arrangements for make-up work will be made for approved absences only. Make-up work will be tailored to the assignment/activity that was missed.

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with University policies which can be found at: https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/#absencestext.

LATE WORK POLICY
Assignments and quizzes are turned in electronically via Canvas. Refer to the syllabus schedule or Canvas assignments tab for due dates and times. Without an excused absence, students will not have the option to complete a quiz after the established close date/time. Late assignments will lose value at the rate of 10% each subsequent late day (weekend days count too!).

DESCRIPTION OF ASSIGNMENTS

Attendance
Attendance/Participation in in-person classes (class will be conducted via synchronous online discussion until Sept. 13) and synchronous online discussions (Zoom sessions) are required. Useful participation requires asking thoughtful questions, responding to instructor’s questions, and bringing in new perspectives. During online discussion sessions, the instructor may randomly stop the recording for a few minutes and ask everyone to turn the webcams on to record attendance.

Homework Assignments
Homework assignments will generally consist of a set of calculations to reinforce the statistical concepts discussed in class. All homework is due the following Monday at 11:59 pm (Central). To earn full credit, you must show your work (i.e., write out the equations). Some homework assignments will need to be completed in an Excel spreadsheet. In those cases, you will be required to upload the Excel file to the assignment in Canvas to receive full credit.

Weekly Quizzes
There will be a short quiz (4-5 questions) each week that Dr. Miller is instructing (Weeks 9 – 15) to reinforce the lecture material not related to calculations. Weekly quizzes cover the coinciding/current Module lectures, and they are due on Tuesdays before class meetings (5 PM Central). Each quiz and your participation on Tuesdays will be graded.

Mini Lab Reports
During some weeks, you will practice using standard natural resource equipment and collect small data sets in an outdoor setting. In the mini lab reports you will summarize your efforts (methods) and results. These are intended to be slightly more in depth than the homework assignments, but less intense than the full-scale lab reports. In your mini reports you will briefly summarize the methods for data collection and analysis, present your results in tables and figures, and provide a brief (1-2 paragraph) summary and/or interpretation of the results (total of 2-3 pages or so). You may also be required to upload the Excel file (or attach additional sheets) showing your calculations into Canvas.
**Full Lab Reports**
The purpose of extended Saturday labs is to gain experience with the techniques used in resource sampling and to reinforce the methods for analyzing environmental data. For full lab reports, you will present the results of the lab exercises using standard scientific reporting, including the following sections: Abstract, brief Introduction and Objectives, Methods, Results, and Conclusions. You will receive and should refer to the Report Writing Guidelines and the Grading Rubric sheet to review the specific criteria needed in each section. Your grade will be based on accuracy of calculations, clarity of text, grammar, and formatting/presentation.

**Exams**
The exams are intended to evaluate your understanding of conceptual material and to demonstrate your critical thinking and problem-solving skills in applying these concepts and techniques under a variety of sampling scenarios. The format will be a combination of calculations, matching, multiple choice, true/false questions, and short answer (3-4 sentences). The exams will be administered either in-person or online.

**ONLINE COURSE EVALUATION PROCESS**
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/](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/](https://ufl.bluera.com/ufl/). Summaries of course evaluation results are available to students at [https://gatorevals.aa.ufl.edu/public-results/](https://gatorevals.aa.ufl.edu/public-results/).

**MATERIALS AND SUPPLIES FEES $24.63**

**ACADEMIC HONESTY POLICY:**
As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.” You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit 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."

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g., assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: [https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/](https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/).

**SOFTWARE USE**
All faculty, staff and students of the University of Florida 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.
INCLUSIVE LEARNING ENVIRONMENT
This course embraces the University of Florida’s Non-Discrimination Policy, which reads, *The University shall actively promote equal opportunity policies and practices conforming to laws against discrimination. The University is committed to non-discrimination with respect to race, creed, color, religion, age, disability, sex, sexual orientation, gender identity and expression, marital status, national origin, political opinions or affiliations, genetic information and veteran status as protected under the Vietnam Era Veterans’ Readjustment Assistance Act.*

If you have questions or concerns about your rights and responsibilities for inclusive learning environment, please see the instructor or refer to the Office of Multicultural & Diversity Affairs website: [http://multicultural.ufl.edu](http://multicultural.ufl.edu).

SERVICES FOR STUDENTS WITH DISABILITIES
The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation.

0001 Reid Hall, 352-392-8565, [https://disability.ufl.edu/](https://disability.ufl.edu/)

STUDENT LIFE, WELLNESS, AND COUNSELING HELP
Students experiencing crises or personal problems that interfere with their general wellbeing are encouraged to utilize the university’s counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

- University Counseling & Wellness Center, 3190 Radio Road, 352-392-1575, [https://counseling.ufl.edu/](https://counseling.ufl.edu/)
  - Counseling Services
  - Groups and Workshops
  - Outreach and Consultation
  - Self-Help Library
  - Wellness Coaching
- U Matter We Care, [https://umatter.ufl.edu/](https://umatter.ufl.edu/)
- Career Resource Center, First Floor JWRU, 392-1601, [https://career.ufl.edu/](https://career.ufl.edu/)

ACADEMIC RESOURCES
[**E-learning technical support**](mailto:Learning-support@ufl.edu) 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu.

[**Career Resource Center**](mailto:CareerResourceCenter@ufl.edu), Reitz Union, 392-1601. Career assistance and counseling.

[**Library Support**](http://library.ufl.edu), Various ways to receive assistance with respect to using the libraries or finding resources.

[**Teaching Center**](mailto:TeachingCenter@ufl.edu), Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.

[**Writing Studio**](mailto:WritingStudio@ufl.edu), 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers.

[**Student Complaints Campus On-Line Students Complaints**](mailto:studentcomplaints@ufl.edu)
STUDENT COMPLAINTS:

- Online Course: http://www.distance.ufl.edu/student-complaint-process

IN-CLASS RECORDING:

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.
TENTATIVE SCHEDULE FALL 2021

In classroom, online sessions, and/or outdoors activities on the Milton Campus are held Tuesdays at 5 – 8 PM Central Time. Off-campus labs will be held on Saturdays (meeting location/time TBA). This course plan and syllabus are subject to change in response to student and instructor needs. Any changes will be clearly communicated in advance through Canvas.

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<thead>
<tr>
<th>Date</th>
<th>Topics and Activities</th>
<th>Assignment Due</th>
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| **Week 1** | **Tuesday, Aug. 24 at 5 PM**  
*Synchronous online discussion session*  
*Topics: Course introduction; Review of statistics/describing your data* |                                                     |
| **Week 2** | **Tuesday, Aug. 31 at 5 PM**  
*Synchronous online discussion session*  
*Topics: Sampling theory and design*  
*Mini Lab/Activity 1: Atmospheric data and measurements* |                                                     |
|            | **Sept. 6**  
*Labor Day* |                                                     |
| **Week 3** | **Tuesday, Sept. 7 at 5 PM**  
*Synchronous online discussion session*  
*Topics: Normal Distribution, Central Limit Theorem, Confidence intervals* | **Tuesday, Sept. 7 at 5:00 PM**  
- Homework #1 Due  
- Mini Lab/Activity 1 Report Due |
| **Week 4** | **Tuesday, Sept. 14 at 5 PM**  
*Topics: Hypothesis testing- one sample tests* | **Tuesday, Sept. 14 at 5:00 PM**  
- Homework #2 Due |
| **Lab Fieldtrip** | **Saturday, TBA**  
*Mini Lab: Aquatic (Group 1)* |                                                     |
| **Week 5** | **Tuesday, Sept. 21 at 5 PM**  
*Lecture: Hypothesis testing- two sample tests*  
*Review: Exam 1 topics* | **Tuesday, Sept. 21 at 5:00 PM**  
- Homework #3 Due |
| **Lab Fieldtrip** | **Saturday, TBA**  
*Mini Lab: Aquatic (Group 2)* |                                                     |
| **Week 6** | **Tuesday, Sept. 28 at 5 PM**  
*Exam 1* | **Tuesday, Sept 28 at 5:00 PM**  
- Homework #4 Due |
| **Lab Fieldtrip** | **Saturday, Oct. 2 or week of Oct. 4**  
*Full Lab: Wildlife Density (Bee) – Transect and Distance Sampling* |                                                     |
| Week 7 | **Tuesday, Oct. 5 at 5 PM**  
*Lecture*: Forestry measurements and inventory/Misc. topics  
*Mini Lab/Activity 2*: Use of forestry equipment (dbh tapes, clinometers, etc.) |
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<tbody>
<tr>
<td>Oct. 8-9</td>
<td>Homecoming break</td>
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| Week 8 | **Tuesday, Oct. 12 at 5 PM**  
*Lecture*: Human dimensions- surveys, qualitative data |
| | **Tuesday, Oct. 12 at 5:00 PM**  
- Homework #5 Due  
- Mini Lab/Activity 2 Report Due |
| Week 9 | **Recorded lecture**: Intro to animal sampling; Indices & census; Fixed plots & aerial sampling  
**Tuesday, Oct. 19 at 5 PM**  
*In-person class meeting* |
| | **Tuesday, Oct. 19 at 5 PM**  
- Quiz #1 Due |
| Week 10 | **Recorded lecture**: Point counts and circle plots; Double sampling  
**Tuesday, Oct. 26 at 5 PM**  
*In-person class meeting* |
| | **Monday, Oct. 25 at 11:59 PM**  
- Homework #6 Due  
**Tuesday, Oct. 26 at 5 PM**  
- Quiz #2 Due |
| Lab Fieldtrip | **Saturday, Oct. 30**  
*Full Lab*: Forestry lab at Jay Research Facility |
| Oct. 30 | |
| Week 11 | **Recorded lecture**: Distance sampling - Unbounded line transect and variable circle plot; Monitoring populations using mark-recapture (resight)  
**Tuesday, Nov. 2 at 5 PM**  
*In-person class meeting* |
| | **Monday, Nov. 1 at 11:59 PM**  
- Aquatic Mini Lab Report Due  
**Tuesday, Nov. 2 at 5 PM**  
- Quiz #3 Due |
| Week 12 | **Tuesday, Nov. 9 at 5 PM**  
*Exam 2*  
**Monday, Nov. 9 at 5:00 PM**  
- Forestry Full Lab Report Due |
| Week 13 | **Recorded lecture**: Occupancy  
**Tuesday, Nov. 16 at 5 PM**  
*In-person class meeting* |
| | **Monday, Nov. 15 at 11:59 PM**  
- Homework #8 Due  
**Tuesday, Nov. 16 at 5 PM**  
- Quiz #4 Due |
| Week 14 | **Recorded lecture**: Radio telemetry and remote cameras  
**Tuesday, Nov. 23 at 5 PM**  
*In-person class meeting* |
| | **Monday, Nov. 22 at 11:59 PM**  
- Wildlife Density Full Lab Report Due  
**Tuesday, Nov. 23 at 5 PM**  
- Quiz #5 Due |
<p>| Nov. 24 – 27 | Thanksgiving break |</p>
<table>
<thead>
<tr>
<th>Week 15</th>
<th>Recorded lecture: Herpetofauna and small mammal sampling; Bird sampling</th>
<th>Monday, Nov. 29 at 11:59 PM</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>- Homework #9 Due</td>
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<tr>
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<td>Tuesday, Nov. 30 at 5 PM</td>
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<tr>
<td></td>
<td>In-person class meeting</td>
<td>- Quiz #6 Due</td>
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<td>Week 16</td>
<td>Tuesday, Dec. 7 at 5 PM</td>
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<td>Review: Final Exam</td>
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<tr>
<td>Dec. 9 – 10</td>
<td>Reading days</td>
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<tr>
<td>Week 17</td>
<td>Tuesday, Dec. 17</td>
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<td></td>
<td>Final Exam</td>
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