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| STAT 0116: Introduction to Statistical Science | |
| **Instructor:** | A hexagon with a graph  Description automatically generated  Emily Malcolm-White (she/her) *Please address me as “Professor Emily”***emalcolmwhite@middlebury.edu** | |
| **Office Hours:** | Drop-In Office Hours in WNS 215 Tuesday 2:15 - 3:30pm Wednesday 2:15 - 3:30pm Thursday 9:45 - 11am | |
| **TA Office Hours:** | TBD | |
| **CLASS MEETING FORMAT** | |

*Spring 2024*

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| **Class:** | **Section B Monday and Wednesday 12:45 – 2pm WNS 100**  *We will use this time for learning new concepts, active learning activities, and practice problems.* |
| **Lab:** | **Section Y Tuesday 12:45 – 2pm WNS 105**  *We will use this time to learn the computing language R to implement data analysis and visualization. You will need to have access to a laptop with you to class. See more details below.* |
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# COURSE DESCRIPTION

A practical introduction to statistical methods and the examination of data sets. Computer software will play a central role in analyzing a variety of real data sets from the natural and social sciences. Topics include descriptive statistics, elementary distributions for data, hypothesis tests, confidence intervals, correlation, regression, contingency tables, and analysis of variance. The course has no formal mathematics prerequisite, and is especially suited to students in the physical, social, environmental, and life sciences who seek an applied orientation to data analysis.

# COURSE LEARNING OBJECTIVE

Our course aims for students to:

* learn the basics of statistical theory and common statistical techniques
* acquire the computation skills to be able to summarize, graph, and make inference in the statistical computing language R
* be able to apply critical thinking and statistical thinking to their lives, including reading newspapers and journal articles

# TEXTBOOK AND MATERIALS

First and foremost – there is nothing that you need to purchase to participate in this class. All materials are used in the class are free and open-source.

* The website for this course is on Middlebury Canvas. Please check Canvas often for assignments, deadlines, resources, and announcements.
* Students must have access to a laptop with R ([http://www.r-project.org)](http://www.r-project.org/) and RStudio [(http://www.rstudio.com)](http://www.rstudio.com/) installed. Both are free and installation instructions are available on Canvas. We will walk through installation together on the first lab.
  + Laptops with R/RStudio pre-installed are available to borrow from the Davis Family Library. This is a good option for those of you without access to laptop or those of you may be having a short-term issue with your laptop. See your instructor or the front desk of the Davis Library for more info.
* We will be following the *free* online textbook: *Intro to Modern Statistics* by Mine Cetinkaya-Rundel and Johanna Hardin and OpenIntro. There are several different ways to access to the textbook:
  + View online here: <https://openintro-ims.netlify.app/> o Download a PDF here: <https://leanpub.com/imstat>

§ If you want to skip the optional contribution, set the price to $0.

* + Order a printed copy on Amazon here: [https://www.amazon.com/Introduction-ModernStatistics-Mine-%C3%87etinkaya-Rundel/dp/1943450145/](https://www.amazon.com/Introduction-Modern-Statistics-Mine-%C3%87etinkaya-Rundel/dp/1943450145/)
* During Week 3 when we discuss probability, it may be helpful to view some supplementary material (PDF) on Probability: <https://www.openintro.org/go/?id=stat_os4_probability_chapter&referrer=/book/ims/index.php>

# ACADEMIC INTEGRITY

You are bound by Middlebury College’s honor code, including its policies on plagiarism and cheating. Violation of these rules is ground for failure. To avoid charges of plagiarism, cite all the sources to use to complete your assignments/homework (including any peers who helped you)

A Note on Academic Integrity: I encourage you to seek help in understanding the concepts and problems in your assignments from various sources, including peers, instructors, peer tutors, class notes, textbooks, and online sources. To maintain academic integrity and properly credit your resources, it is important to:

1. Write up your own solutions to assignments independently and in your own words
2. Include an Acknowledgements section at the beginning or end of your assignment. In this section, give credit to people who have helped you, acknowledge useful websites, and list any other resources you used.

# LATE POLICY

Consistent engagement with the course material is essential for your learning and academic growth.

However, I understand that unforeseen circumstances may occasionally arise.

* When you become aware that you won’t be able to make a deadline, please email Professor Emily to let her know which homework you won’t be submitting on time and what date you anticipate the homework will be done. You do not need to disclose *why* you are missing the deadline. **So long as you communicate to me before the deadline, no late penalty will be applied.**
* If you do not communicate with me before the deadline, late submissions will be subject to a penalty of 20% per day.

**COURSE ASSESSMENT:**

A detailed list of assignments and due dates in listed on the course Canvas page: <https://middlebury.instructure.com/courses/14030>

The following components will determine your final grade. They will be weighted as follows:

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| **30%** | **Homework** | Typically, there will be one assignment from Monday’s class (due Thurs) and one assignment from Wednesday’s class (due Mon). Assignments should be submitted on Canvas by 11:59pm EST. Check the course website regularly for homework assignments and deadlines. |
| **15%** | **Labs** | *The lowest two homework grades will be dropped.*  Material for the computer lab assignments will be covered on  Tuesdays. I anticipate many students will be able to complete the lab within the lab period, but I’ve allowed a few extra days in case students need some extra time to complete the lab or to ask questions.Labs should be submitted on Canvas on Fridays by 11:59pm EST.  *The lowest lab grade will be dropped.* |
| **30%** | **Take Home Tests** (2) | There will be two tests in this course each consisting of two parts:   * **A Written Part** which consists of written problems related to concepts in the course. You can take as long as you need to complete the test, but you must take it in one sitting. Typically, students arrange a time to take exam on Monday (before, during, or after class). Your work will be submitted in-person to the instructor after finishing the exam. * **An R Part** whichinvolves a short analysis in R (time given in class on Tuesday. You can continue to work on it until the due date on Friday). Work will be submitted on Canvas.   **Both parts of the test are open-book.** Referencing class notes, previous class assignments/labs, the textbook, and online sources is appropriate. **Tests should be completed independently** without help or discussion with your peers, tutors, or friends. |
| **25%** | **Final Project** | You will analyze a dataset of your choice. More details to follow. |

# DIVERSITY & INCLUSION STATEMENT

It is my intent that students from all backgrounds and perspectives be well-served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength and benefit. It is my intent to present materials and activities that are respectful of diversity: gender identity, sexual orientation, disability, age, socioeconomic status, ethnicity, race, religion, culture, perspective, and other background characteristics. Your suggestions about how to improve the value of diversity in this course are encouraged and appreciated. Please let me know ways to improve the effectiveness of the course for you personally or for other students or student groups. (Adapted from University of Iowa)

# NAME/PRONOUN POLICY

I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records. If your name or pronoun changes during the course of the semester, please let me know.

# STATEMENT ON RELIGIOUS HOLIDAYS

Campus policies regarding religious observances requires that faculty make every effort to deal reasonably and fairly with all students, who because of religious obligations, have conflicts with schedules exams, assignments or required attendance. Please have a look through the course calendar and let me know as soon as possible if you anticipate such conflicts so that we can agree upon alternative arrangements.

# ACCOMMODATIONS FOR DISABILITIES

Students who have Letters of Accommodation in this class are encouraged to contact me as early in the semester as possible to ensure that such accommodations are implemented in a timely fashion. For those without Letters of Accommodation, assistance is available to eligible students through the Disability Resource Center (DRC). Please contact ADA Coordinators Jodi Litchfield, Peter Ploegman or Dierdre Kelly of the DRC at ada@middlebury.edu for more information. All discussions will remain confidential.

# STUDENT ATHLETES

Please have a look through the course calendar and let me know as soon as possible if you anticipate any conflicts with your athletic schedule so that we can agree upon alternative arrangements. Whenever possible, I would appreciate notice at least a week ahead of time of any explained absences.