

Syllabus

Molecular Genetics 5650: Analysis of Biological Data

Autumn 2022

Instructor: Gregory C. Booton, PhD

Lecture: In-Person 12:40-1:35pm M,W,F, 209 Campbell Hall

Dr. Booton contact information

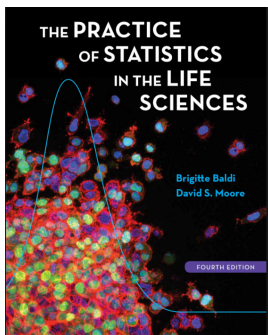
Office: 578 Aronoff Laboratory

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Email: booton.1@osu.edu

Office Hours: Mon & Weds: 11am-12pm

Required Textbook Available via CarmenBooks



The Practice of Statistics in the Life Sciences, fourth edition

Author: Brigitte Baldi and David Moore ISBN: 9781319013370

Achieve online learning software required

The textbook and/or courseware for this course is being provided via CarmenBooks. Through CarmenBooks, students obtain publisher materials electronically through CarmenCanvas, saving them up to 80% per title. The fee for this material is included as part of tuition and is listed as CarmenBooks fee on your Statement of Account. In addition to cost-savings, materials provided through CarmenBooks are available immediately on or before the first day of class. There is no need to wait for financial aid or scholarship money to purchase your textbook.

Unless you choose to opt-out of the program, you do NOT need to purchase any materials for this course at the bookstore. For more information on the program or information on how to opt out, [please visit the CarmenBooks website](#).

[Baldi Achieve for Practice of Statistics in the Life Sciences] • [4th edition] • [Macmillan] •

Access the courseware for this title through the Achieve link found after clicking the “Macmillan Higher Education” link in the course navigation.

Course Description

This course is designed for students with majors in the life sciences. It will focus on the practical application and interpretation of statistical analyses commonly used in biological science applications. Among the data analysis and statistical tests that will be explored will be graphical displays of data distributions, probability, z-tests, t-tests, analysis of variance, Chi-square testing for goodness of fit, hypothesis testing, correlation and regression analysis, and some non-parametric methods. In addition, there will be an emphasis on experimental design, biases, and the appropriate choice of the statistical test(s) to employ in each situation. Review of journal articles using the tests being studied will also be included in this course. In addition to two lecture classes per week, there will be a third meeting of the class per week during which selected assigned problems will be reviewed. In summary, following completion of this course the student will have a better understanding of statistical tests commonly employed in various biological disciplines, and an insight into the proper choice and application of these statistical tests.

Grading system

The final letter grades assigned in MG5650 will be based on the number of points obtained from a total of 740 points available for the course. This will consist of two midterm exams with values of 75 and 100 points. and one final exam worth 160 points. Further, there will be an individual written project that will be turned in in two separate submissions that will be worth a total of 65 points. The point totals for weekly homework assignments will vary depending on the number of textbook chapters associated with that homework set, e.g., HW1 is a total of 35 points, HW 3 is 50 points, HW 4 is 30 points, etc. Please see the specific weekly homework assignment in Achieve for individual homework point totals. All together, the Achieve Learning assignments will total 340 points for the semester.

These assignments/activities will be done in the Achieve Learning environment associated with the online text and learning materials. Achieve Learning homework and StatsTutor assignments are due online at the beginning of lecture on Fridays (typically). Please see the weekly schedule or the Achieve Learning activities list for specific dates for each assignment. During the Friday class we will review all, or a subset, of these assigned problems. This will allow you to identify the material that you understand and are mastering, and give you the opportunity to discover what you need to work on etc.

IMPORTANT HEALTH STATEMENT: Since this course is meeting in-person and has graded assignments each week you will need to contact the instructor immediately if you are quarantined or become ill such that you are unable to participate in class or complete the assignments. This

will allow us to develop an alternative plan, if necessary, so that you can successfully complete the course.

Course Points Summary

Homework assignments (Achieve Learning)	220 points
StatsTutor assignments (Achieve Learning)	120 points
Midterm I (in-class)	75 points
Observational Study Part I (submitted online)	25 points
Midterm II (in-class)	100 points
Observational Study Part II (submitted online)	40 points
Final Exam	160 points

Course Total Points 740 points

The final course grade will be adjusted based on the greatest number of points obtained in the course. The final grading scale will be approximately 90-100%: A- and A; 80-89%: B and B+; 65-79: C-, C, C+, and B-. Below 65 will be a D, below 50 will be an E. Attendance at midterms is mandatory, **NO** makeup midterms will be given. If you miss a midterm, you will receive a zero for that midterm, and your final grade will include that zero in the final calculation of your grade. If you have a conflict with a midterm date, please notify me **as soon as possible** so that arrangements can be made for you to take the exam on an earlier date. The final must be taken to obtain a grade in this course. If you miss the final exam, you will be given an Incomplete. You will be allowed to make up the Incomplete grade only after presenting documentary proof that you missed the final exam because of severe illness. Otherwise, your grade will be based on points received, counting the final exam as zero. There will be further details on the final exam as we get closer to the end of the semester.

Carmen

Powerpoint presentations will be available at the Carmen website for the course. Each student enrolled in MG5650 will have access to the website for the course, and you should check there for handouts, powerpoint files, and announcements about the course on a regular basis. You are responsible for obtaining the powerpoint handouts BEFORE lecture. Handouts will not be available in lecture. If you have not used CarmenCanvas before please visit <http://telr.osu.edu/carmen-help/students/guide.html> for more information about student usage of Carmen.

Carmen access

You will need to use [BuckeyePass](#) multi-factor authentication to access your courses in Carmen. To ensure that you are able to connect to Carmen at all times, it is recommended that you take the following steps:

- Register multiple devices in case something happens to your primary device. Visit the [BuckeyePass - Adding a Device](#) help article for step-by-step instructions.
- Request passcodes to keep as a backup authentication option. When you see the Duo login screen on your computer, click **Enter a Passcode** and then click the **Text me new codes** button that appears. This will text you ten passcodes good for 365 days that can each be used once.
- Download the [Duo Mobile application](#) to all of your registered devices for the ability to generate one-time codes in the event that you lose cell, data, or Wi-Fi service.

If none of these options will meet the needs of your situation, you can contact the IT Service Desk at 614-688-4357 (HELP) and IT support staff will work out a solution with you.

Safety statement

The COVID-19 pandemic is still present in our environment. Current expectations can always be found at the [Safe and Healthy Buckeyes \(Links to an external site.\)](#)

Office of Student Life Disability Services

If you need an accommodation based on the impact of a disability, you should contact the instructor to arrange an appointment as soon as possible. At the appointment we can discuss the course format, anticipate your needs and explore potential accommodations. We rely on the Office of Student Life Disability Services (SLDS) for assistance in verifying the need for accommodations and developing accommodation strategies. If you have not previously contacted the SLDS, we strongly encourage you to do so as soon as possible. Any student currently registered with the SLDS and taking exams at SLDS will need to provide the MG5650 instructor with the SLDS information during the first week of class.

Academic Integrity and Misconduct

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the university's [Code of Student Conduct](#), and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the university's *Code of Student Conduct* and this syllabus may constitute "Academic Misconduct."

The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the university or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the university's *Code of Student Conduct* is never considered an excuse for academic misconduct, so I recommend that you review the *Code of Student Conduct* and, specifically, the sections dealing with academic misconduct.

If I suspect that a student has committed academic misconduct in this course, I am obligated by university rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the university's *Code of Student Conduct* (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the university. If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- The Committee on Academic Misconduct web pages ([COAM Home](#))
- *Ten Suggestions for Preserving Academic Integrity* ([Ten Suggestions](#))
- *Eight Cardinal Rules of Academic Integrity* (www.northwestern.edu/uacc/8cards.htm)

Your written assignments should be your own original work. You should always cite the ideas and words of your research sources. While peer discussions inside and outside of class, as well as participation in study groups, are encouraged, remember that comparing or sharing answers on an assignment or exam is not permitted. Submitting identical work is considered cheating. If you're unsure about a particular situation, please feel free just to ask ahead of time.

Course Technology

For help with your password, university email, Carmen, or any other technology issues, questions, or requests, contact the Ohio State IT Service Desk. Standard support hours are available at ocio.osu.edu/help/hours, and support for urgent issues is available 24/7.

- **Self-Service and Chat support:** ocio.osu.edu/help
- **Phone:** 614-688-4357(HELP)
- **Email:** servicedesk@osu.edu
- **TDD:** 614-688-8743
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Baseline technical skills for course

- Basic computer and web-browsing skills
- Navigating Carmen: for questions about specific functionality, see the [Canvas Student Guide](#).
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Required Technology skills specific to this course

- [CarmenZoom for virtual office hour meetings and online classes and final exam at the end of the semester](#)
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Required equipment

- Computer: current Mac (OS X), PC (Windows 10), or iPad with high-speed internet connection
- Webcam: built-in or external webcam, fully installed and tested
- Microphone: built-in laptop or tablet mic or external microphone
- Other: a mobile device (smartphone or tablet) or landline to use for BuckeyePass authentication
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Software

- [Microsoft Office 365](#): All Ohio State students are now eligible for free Microsoft Office 365 ProPlus through Microsoft's Student Advantage program. Full instructions for downloading and installation can be found [at go.osu.edu/office365help](https://go.osu.edu/office365help).

Technology help

To succeed in this course, you need to have basic computer and web-browsing skills, ability to use the Carmen learning management system, and familiarity with CarmenZoom. You should have a computer (desktop, laptop, or tablet) with a high-speed internet connection, a functional webcam (built-in or external), and a microphone (built-in or external). You will also need a mobile device (cell phone or tablet) to use for BuckeyePass authentication. Required software includes a PDF reader (e.g. Acrobat Reader) and Microsoft Office 365. Note that all Ohio State students are eligible for free Microsoft Office 365 ProPlus through Microsoft's Student Advantage program. Full instructions for downloading and installation can be found at go.osu.edu/office365help.

For help with your password, university email, Carmen, or any other technology issues, questions, or requests, contact the Ohio State IT Service Desk. Standard support hours are available at ocio.osu.edu/help/hours, and support for urgent issues is available 24/7.

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Diversity Statement

I am committed to promoting a welcoming climate for all students. Please come see me if you are concerned about diversity issues in the course and in your exchanges with other students as a part of class activities. Any conversations with me will be conducted with confidentiality, safety and respect and within university guidelines.

Title IX

All students and employees at Ohio State have the right to work and learn in an environment free from harassment and discrimination based on sex or gender, and the university can arrange interim measures, provide support resources, and explain investigation options, including referral to confidential resources.

If you or someone you know has been harassed or discriminated against based on your sex or gender, including sexual harassment, sexual assault, relationship violence, stalking, or sexual exploitation, you may find information about your rights and options at titleix.osu.edu or by contacting the Ohio State Title IX Coordinator at titleix@osu.edu. Title IX is part of the Office of Institutional Equity (OIE) at Ohio State, which responds to all bias-motivated incidents of harassment and discrimination, such as race, religion, national origin and disability. For more information on OIE, visit equity.osu.edu or email equity@osu.edu.

Please Take Care Of Yourself (Mental Health Statement)

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you are or someone you know is suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life's Counseling and Consultation Service (CCS) by visiting ccs.osu.edu or calling 614--292--5766. CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on-call counselor when CCS is closed at 614-292-5766. If you are thinking of harming yourself or need a safe, non-judgmental place to talk, or if you are worried about someone else and need advice about what to do, 24 hour emergency help is also available through the Suicide Prevention Hotline (Columbus: 614-221-5445 / National: 800-273-8255); or text (4hope to 741741); or at suicidepreventionlifeline.org

MG5650 Weekly Schedule:

Important Note: Proposed lecture schedule is subject to change based on circumstances during the upcoming semester.

Date	Chapters/HW due dates/Midterms	Week
Weds., Aug. 24	Intro, Chapter 1	1
Fri., Aug. 26	Chp 1, Chp. 2	1
Mon., Aug. 29	Chp 2	2
Weds., Aug. 31	Chp. 6	2
Fri., Sept. 2	NO CLASS HW 1 due.	2
Mon., Sept. 5	Labor Day Holiday, NO CLASS	3
Weds., Sept. 7	Chp 7, Chp 3	3
Fri., Sept. 9	HW 2 due, Review HW1 & Review HW 2	3
Mon., Sept. 12	Chp 4	4
Weds., Sept. 14	Chp 5, Chp 9	4
Fri., Sept. 16	HW 3 due, Review HW 3	4
Mon., Sept. 19	Chp 9, Chp 10	5
Weds., Sept. 21	Chp 10	5
Fri., Sept. 23	HW 4 due, Review HW 4	5
Mon., Sept. 26	Chp 10	6
Weds., Sept. 28	Chp 11	6
Fri., Sept. 30	MIDTERM 1	6
Mon., Oct. 3	Chp 12	7
Weds., Oct. 5	Chp 12,	7
Fri., Oct. 7	HW 5 due, Review HW 5, Obs. Study Part 1 due	7
Mon., Oct. 10	Chp 13	8
Weds., Oct. 12	Chp 14	8
Fri., Oct. 14	NO CLASS: AUTUMN BREAK	8
Mon., Oct. 17	Chp 15	9
Weds., Oct. 19	Chp 16, Chp. 19	9
Fri., Oct. 21	HW 6 & HW 7 due Review HW 6 & 7	9

Date	Chapters/HW due dates/Midterms	Week
Mon., Oct. 24	Chp 19	10
Weds., Oct. 26	Chp 20	10
Fri., Oct. 28	HW 8 due, Review HW 8	10
Mon., Oct. 31	Chp 17	11
Weds., Nov. 2	Chp 17	11
Fri., Nov. 4	MIDTERM 2	11
Mon., Nov. 7	Chpc 18	12
Mon., Nov. 9	Chp 18	12
Fri., Nov. 11	NO CLASS VETERANS DAY	12
Mon., Nov. 14	Chp. 24	13
Weds., Nov. 16	Chp. 24, 21	13
Fri., Nov. 18	HW 9 due, Review HW 9	13
Mon., Nov. 21	Chp 23	14
Weds., Nov. 23	Thanksgiving Holiday/ NO CLASS	14
Fri., Nov. 25	Thanksgiving Holiday/ NO CLASS	14
Mon., Nov. 28	Chp. 23	15
Weds., Nov. 30	Chp 23	15
Fri., Dec. 2	HW 10 due, Review HW 10	15
Mon., Dec. 5	Chp. 22	16
Weds., Dec. 7	HW 11due, Review HW 11	16
Fri., Dec. 9	Observational Study Part 2 due on Carmen	16
Thurs., Dec. 15	FINAL EXAM 2-3:45pm	17