Foundations of Biostatistics

BIOL 350

Mon/Wed 2:00-3:15, Bailey 104

Welcome!

We are so glad you have joined our learning community and look forward to getting to know you. Your unique talents, experiences, and contributions are important to our class. Be ready to learn from others and be willing to teach what you can in return.

What is this course about?

Generally speaking, biostatistics is the application of statistics to the life sciences. In this class, you will use the biological knowledge that you have gained from other classes and experiences to identify and understand patterns in biological data. We will be working in the free R programming environment, a reliable and powerful tool for statistical computing and visualization, because it is used in many scientific disciplines. This course is also about learning and practicing skills for today's careers. Expect an opportunity to challenge yourself and be rewarded for your growth. You'll also be practicing the 4Cs: communication, collaboration, critical thinking, and creativity.

Land acknowledgement

Acknowledging the original occupants of the land upon which SUNY Geneseo resides is essential to our understanding of our obligation to analyze and interpret data in a way that benefits all people. Furthermore, we share this land acknowledgement as a reminder to honor and express gratitude to those who are the traditional stewards of the land. The location of our classroom is on the homeland of the Seneca Nation of Indians and Tonawanda Seneca Nation. We will also be analyzing data collected from places where these original occupants and other Indigenous groups have lived and still continue to live. If you would like to get started now, check out the Native Land app and/or websites such as sni.org to learn more about the community of more than 7,000 enrolled Indigenous Peoples.

Who will be helping you to learn?

INSTRUCTOR: Dr. Suann Yang (she/her)
OFFICE: ISC 256
EMAIL: yang@geneseo.edu (preferred, or use Brightspace)
PHONE: 585-245-5311 (make sure to write this down somewhere as a backup!)
DROP-IN HOURS (NO APPOINTMENT NECESSARY, LOCATION TBA): Tuesday/Thursday 10;30-11:30, Wednesday 10:00-11:00

PEER MENTORS AND QUIZ PROCTORS: Jenna Drapala, Micah Hosley, Adrianna Licata, Madison Steates

DROP-IN HOURS: Schedule available after the first week of classes

YOUR FELLOW STUDENTS: Community Help is a series of public discussion forums on Brightspace where anyone can ask questions, and anyone who knows the answer can provide it. We can not only learn a lot from each other, we can also learn a lot by working with and teaching each other. After the first week of the semester, you will be assigned to a group for the collaborative assignments in the class.

OUR COMMITMENT: Scientific innovation arises from the insights of a diverse community. The unique talents, experiences, and contributions of each individual in our class are crucial and necessary. As your instructors, we strive to create an environment where each person–ourselves included–is ready to learn from others and has the opportunity to teach what they can in return. As in any learning endeavor, we naturally may make mistakes despite good intentions. We will do our best, and believe that everyone will do their best, to learn from and correct mistakes that are harmful to others.

What will you learn?

We have designed this course to enable you to integrate multiple bodies of knowledge with your personal experience and apply what you have learned, in a learning community that values you and your growth. Specifically, we will work together to:

1. Investigate meaningful questions about real-world problems, by conducting parametric and nonparametric statistical analysis on different types of biological data
2. Demonstrate proficiency with using the R programming language to analyze data in a reproducible manner
3. Interpret the results of statistical analyses with respect to biology phenomena and impacts on society, and communicate findings to scientific and general audiences
4. Cultivate a supportive learning community that fosters belonging and empowers all members to achieve their own potential as well as contribute equitably to collaboration
5. Reflect upon our own short- and long-term learning goals, our progress toward them, and how to take action to enrich our own growth

The **learning outcomes** of this course, listed above, support your progress toward the Geneseo Learning Outcomes for a Baccalaureate Education (GLOBE), particularly Quantitative, Computational, and Symbolic Reasoning. In this course, we will focus on your ability to:

- interpret and draw inferences from appropriate mathematical models such as formulas, graphs, tables, or schematics;
- represent mathematical information symbolically, visually, numerically, or verbally as appropriate; and
- employ quantitative methods such as arithmetic, algebra, geometry, or statistics to solve problems.

This course also helps you achieve these learning outcomes of the biology major:

- Students will have the knowledge base and intellectual (conceptual) framework to use reasoning and problem-solving skills to; (1) read critically, (2) evaluate support for competing hypotheses, and (3) critique experimental design.
    - *BIOL 350 emphasizes practice in applying knowledge to new situations*
- Students will have the laboratory and inquiry skills and technical ability to formulate hypotheses, design and run experiments using instruments to test their hypotheses, and analyze and interpret the results. They will be able to build on earlier work to design further experiments.
    - *BIOL 350 has many opportunities to analyze and interpret real data, using modern statistical software.*
- Students will be able to communicate biological ideas from literature or their own laboratory investigations to audiences of biologists and non-biologists in a variety of formats including written reports, poster and oral presentations.
    - *BIOL 350's semester-long collaborative data analysis project gives you practice with communicating scientific findings to other biologists*
- Students will recognize the importance of scientific integrity and ethical research and applications of biology to science policy. They will be able to work independently and in teams for life-long learning.
    - *BIOL 350 is designed with both individual and team learning activities, giving you practice with explaining statistical concepts to your peers. Through our data analysis projects, we will be contributing to sustainable natural resource management in our region.*
- Students will be able to demonstrate a broad and diverse background in biology and related sciences and a strong foundation for graduate and professional programs of study or employment.
    - *BIOL 350 hopes to foster your interest in the quantitative skills that apply to all areas of biology.*

What do you need for this class?

I have designed this course to be as affordable as possible. Required materials for the class have no cost for Geneseo students.

1. Daily access to our course **Brightspace** site. Use our Brightspace site as the starting point for everything you need to do in the course. It will also be the primary mode of communication used by the instructional team to send you regular announcements and updates.
2. Reliable **Internet** access and a **laptop** that can run the software listed below
3. This **software** installed on your laptop
    a. R software (free download, https://cran.r-project.org/)
    b. RStudio (free download, https://posit.co/downloads/). RStudio requires a 64-bit operating system.
    c. Microsoft Excel (free to all Geneseo students, https://geneseo.atlassian.net/wiki/spaces/HELP/pages/76780164/Microsoft+Office+365
    d. Microsoft Teams (free to all Geneseo students, https://geneseo.atlassian.net/wiki/spaces/HELP/pages/76780293/Microsoft+Teams+at+Geneseo)
4. **Required textbook:** *Introduction to Statistics for the Life and Biomedical Sciences*, 1st ed. by Julie Vu, Dave Harrington, and OpenIntro. Free PDFs of each chapter can be found on our Brightspace course page. A physical copy can be ordered online through Amazon or other retailers for about $20.
5. **Optional additional textbook (not required)**: *A Primer in Biological Data Analysis and Visualization Using R* by Gregg Hartvigsen, any edition. You may have this already from another course, such as BIOL 116, 118, 120, or 203.

How will you know that you are learning?

Learning to do statistics requires just that - *doing statistics*. To accomplish this, I have designed the course to be a combination of self-paced work (such as readings and assignments) along with interactive lectures and group activities during class sessions (such as paired programming exercises). In general, after exploring the topics at the beginning of each class together, be ready to get started on the code tutorial and concept check for the remainder of each class period. A problem set or other applied assignment will follow to wrap up each topic. Work that is started during the class period should be finished as homework unless otherwise indicated. Every three weeks, we'll test your skills in R with live coding quizzes.

You will receive feedback on your progress in three major categories: **assignments, quizzes, and a collaborative project**. All of these activities are opportunities for you to learn new concepts, and apply and integrate your understanding.

Grading scheme

Item	Percent	Notes
Assignments	60	Tutorials, concept checks, problem sets, etc.
Live coding quizzes	20	4 total, all require the use of R
Collaborative project	20	Includes deadlines throughout semester & peer evaluation
Statistics in the Media		Regular extra credit opportunity (limit of 4)

Components of your grade

1. **Assignments:** To help you master each topic, I will assign readings, code tutorials, problem sets, and other activities *every week*. These will be worth a range of point values (0 to ~20), and the proportion of the points you earn out of the total (~200) will be used to calculate your overall assignment score. All assignments are submitted online through Brightspace. Each assignment has scoring rubrics, which may be useful to you for reviewing your work before submitting.
2. **Live coding quizzes:** About every three weeks, each student is assigned a 10-minute block of time for an online, live coding quiz (see exact dates in schedule; all are Wednesdays during class time). The quizzes will be administered via Microsoft Teams, so you will need a reliable internet connection and a quiet place to work during your block of time. During your quiz time, you will be assigned a small set of coding tasks. To take the quiz, you will screen share with your quiz proctor (instructor or TA), and we will follow along as you complete the coding tasks. Working with R under a time constraint is naturally stressful for many students. To help you prepare yourself for this part of the quizzes, I will post the upcoming quiz's data set (a CSV file) on the Friday before each quiz. See each quiz's description in Brightspace for a list of possible coding tasks that you should be prepared to complete.
3. **Collaborative Data Analysis Project:** In this project, our class will contribute to the Wyoming County Soil and Water Conservation District's efforts to establish a water quality sampling program for streams in Wyoming County, New York. You are going to be building on the work of students from past semesters, which is exciting! You will work in assigned teams to study various parameters that can be monitored in streams to evaluate water quality. We will use data collected in the past by the Department of Environmental Conservation (NY DEC), the Soil and Water Conservation District and other sources. Several class meeting times will be devoted to developing, discussing, and working on these projects. There are multiple components and deadlines throughout the semester: i) literature review, ii) cleaning and processing the data for exploratory analyses, iii) an initial report and peer feedback, iv) analysis plan, v) individual analysis report, vi) group analysis

report, vii) final oral presentation, and viii) peer evaluations throughout the semester. Adjustments to individual scores will be made based on final peer evaluations. To facilitate group development, you complete a survey on your interests, experience, and availability at the beginning of the semester. I will use the results of this survey to assign you to your project teams.

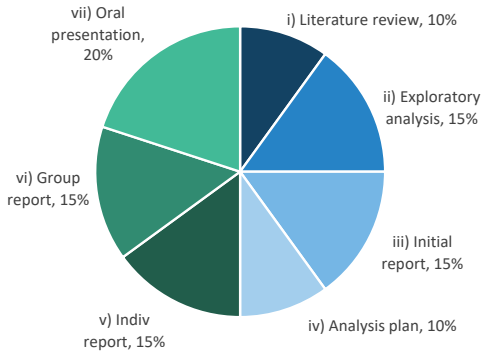

Fig. 1. Breakdown of collaborative data analysis project by i-iv) planning (blues) and v-vii) execution (greens) steps, in one of the only pie graphs you'll see in this class.

4. **Statistics in the Media:** You can find statistics everywhere! In this extra credit assignment, you will find an example of statistics usage in the media, and summarize and critique it. Credit earned will be applied toward live coding quizzes. There will be four windows of opportunity for you to complete this assignment for extra credit points (submit via Brightspace). The article, blog post, etc. must be published within each window of time to be valid. Each example must be unique; only the first student to turn in a particular example will get the credit. You may want to consider this extra credit opportunity like disaster insurance: invest the time in completing the assignment from the first opportunity, just in case you need these points later.

Final course grades will be determined as shown here:

A range	B range	C range	D and E
A 93.3 - 100%	B+ 86.6 - 89.99%	C+ 76.6 - 79.99%	D 60.0 - 69.99%
A- 90.0 - 93.29%	B 83.3 - 86.59%	C 73.3 - 76.59%	E <59.99%
	B- 80.0 - 83.29%	C- 70.0 - 73.29%	

What are our shared responsibilities to our learning community?

Students, teaching assistants, and the professor have communal responsibilities to our community, to promote learning, maintain a respectful environment, and prioritize our health and wellbeing. In our classroom, we are preparing you for not only other courses in the biology program, but also for your professional career.

Responsibilities to promote learning

1. **Making space for everyone to contribute.** Scientific innovation arises from the insights of a diverse community. The unique talents, experiences, and contributions of each individual in our class are crucial and necessary. Be ready to learn from others and be willing to teach what you can in return. As in any learning endeavor, we naturally may make mistakes despite good intentions. Each person will do their best, and believe that others are doing their best, to learn from and correct mistakes that are harmful to others.
2. **Class attendance**. Class meeting times will be used for interactive lectures and to get live help while completing assignments. If you need to miss a class meeting (e.g., illness-related reasons), please let me know as soon as possible so that we can discuss ways to keep you on track. If you are experiencing longer-term disruptions, please be proactive in communicating with me and contact the Dean of Students if you expect to be out for an extended period of time. If I need to cancel a class meeting because of an emergency, I will use Brightspace to inform you as soon as I can.
3. **Preparation.** Science is a process of discovery, and we will engage in this process during every class. Be prepared to take an active role in learning the material and practicing new skills. The course is designed with a workload that is typical for 3 credit classes: about 9-10 hours per week. We encourage you to start assignments as early as possible and develop a regular schedule for your work in this class. Please check Brightspace frequently for updates on what you need to be ready for each class or any changes in assignment deadlines. I will also use Brightspace to send you weekly announcements to remind you of the tasks to be completed each week.
4. **Timeliness and deadlines.** Arriving to class on time and completing our work in a timely fashion are critical. Posted deadlines and your own personal deadlines keep the work in this class manageable. Please be considerate to yourself (and your teammates) and create mini-deadlines well in advance of the major deadlines. Likewise, do your best to stick to deadlines and meeting times that are planned by you and your team, and communicate immediately if something interferes with those plans. The instructional team will also return feedback on assignments promptly, to help you monitor your learning. Occasionally, I will only be able to offer general feedback on the work of the class as a whole, especially during the month of advising. If you discover that a due date might be a problem, you should contact me immediately with a proposed solution so that we can discuss what is possible for your situation.

5. **Commitment.** Everyone will dedicate ourselves to doing our best work within the circumstances that we're experiencing. We will keep in mind that there could be several situations that anyone in our community is managing, which could differ from our own. Thus, we should all try to promote an effective learning environment by minimizing distractions and designing a place to work that helps us to focus and stay on task. In addition, we should also try to help others to stay on task, especially during class sessions, or time we have scheduled to work with our teammates.

Responsibilities to maintain a respectful environment

1. **Communication**. Everyone is expected to check their email at least twice a day, and use email, Brightspace, or other mutually-agreed upon methods to communicate with each other. Please make sure to set Brightspace notifications to send you emails with updates, and set aside time to read these so you don't miss anything important. You can also meet with professors and teaching assistants in drop-in hours or by appointment.
2. **Uphold the Student Code of Conduct.** The Geneseo code of conduct asks all students to commit to behaviors so that all members of our community can fulfill the values of the college: Learning, Creativity, Belonging, Civic Engagement, and Sustainability. Academic dishonesty and behavior that physically or psychologically harms others will be reported to the corresponding authorities. Academic dishonesty includes providing false information (lying, making up data), cheating (seeking, receiving and/or offering unpermitted help) and plagiarism (representing work as your own when it was created by others, including AI such as ChatGPT). Consulting with other students for individual assignments is fine, but you must each produce original written answers or code (no copying and pasting). Check with the instructional team if you are not sure where the line between collaboration and copying stands on any assignment. Evidence of plagiarism and/or academic dishonesty is grounds for a score of '0' on any assignment and further action including notifying the department chair, which can result a report filed with the Dean of Students. For full details of the Student Code of Conduct, please see the Student Handbook.
3. **Respect copyright and licensing.** All materials used in this course, including lectures, slides, videos, and handouts, have specific licensing and copyright restrictions that identify how they can be used, distributed, and adapted. The original work created by me, your instructor, is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License. Materials created by other authors have their own licensing and copyright restrictions. Please do not violate the restrictions we have put on our intellectual property. This includes, but is not limited to, transferring files to websites such as StudyBlue and Course Hero, storing old tests in sorority/fraternity test banks, and passing on assignments to friends who may take the course in the future. Be aware that UUP (Union of University Professionals, the union representing faculty on this campus) is seeking to take legal action against groups who violate copyright, and that posting or selling copies of materials to such groups may put a student in legal jeopardy.

Responsibilities to prioritize health and wellbeing

The COVID-19 pandemic disrupted our learning over the last few years and significantly changed many other aspects of our lives. I have designed this course keeping in mind these impacts that the pandemic may have had on our learning community, and related aspects of our health and wellbeing. Please consider our communal responsibilities of prioritizing health and wellbeing, especially with extending grace to yourself and others, and being thoughtful about your own safety and that of others.

If you are not feeling well, please stay home to recover and prevent transmitting an illness to others in the community. Everyone should also feel free to continue wearing a face mask in crowded conditions where the risk of any infectious illness is high, such as classrooms, lecture halls, laboratory rooms, and residence halls. If you choose to wear a mask to protect yourself and others, remember that the mask needs to fit securely, covering your nose and mouth.

Your health and wellbeing are foundational to your ability to learn, and if you find that you are feeling unwell (physically or mentally) and it is impacting your ability to complete your coursework, please reach out. Please remember that it's never too late to ask for help. The Dean of Students (585-245-5706, Dean's website) can also assist and provide direction to appropriate campus resources.

How else does this class support your success and well-being?

At Geneseo, we strive to support your academic success and well-being. This course works with and complements the resources available campus wide, such as academic support services, accessibility, mental health, diversity and inclusion policies, and many more.

Getting help with technology

We will be using computers in our class all the time. For everyday troubleshooting in R, we have the instructor, TAs, and each other. For other assistance, CIT also provides a range of technology support resources, including self help resources and options to request technology assistance. CIT also provides free access to over 7,500 online tutorials for software, digital tools, web development, programming, and design through LinkedIn Learning.

Library Research

Fraser Hall Library has an award-winning staff trained in finding the best information using library resources and advanced search strategies. Students may ask questions about using library services, locating materials, or conducting research projects. There is a librarian who specializes in the subject matter for each major. Our librarian is Sherry Larson-Rhodes. Librarians meet with students through a variety of ways, including chat, email, and in-person and virtual one-on-one research consultations. Email libraryhelp@geneseo.edu or visit their online help desk.

Accessibility

All course materials are available on Brightspace and I've made every attempt to ensure that they are accessible to everyone. If you have difficulties accessing any materials (including needs for alternative formats), please let me know as soon as possible and I will do my best to address the situation. Please note that this is an in-person course with collaborative work.

SUNY Geneseo is dedicated to providing an equitable and inclusive educational experience for all students. The Office of Accessibility will coordinate reasonable accommodations for persons with documented physical, emotional, or cognitive disabilities, as well as medical conditions related to pregnancy or parenting. Students with letters of accommodation should submit a letter to each faculty member at the beginning of the semester and discuss specific arrangements. Please contact the Office of Accessibility Services for questions related to access and accommodations: Erwin Hall 22 or call (585) 245-5112 or email access@geneseo.edu. Visit the Office of Accessibility Services for more information www.geneseo.edu/accessibility-services

- STUDENT RESPONSIBILITY: Please arrange for the Office of Accessibility to send your letter of accommodation to me at the beginning of the semester (or as soon as they have been established) and make an appointment to discuss arrangements.
- INSTRUCTOR RESPONSIBILITY: I am committed to working with you to figure out how to create a just learning environment while meeting the learning outcomes of the course. Unless you communicate otherwise, I will keep all accommodations confidential.

Well-Being

Prioritizing well-being can support the achievement of academic goals and alleviate stress. Eating nutritious foods, getting enough sleep, exercising, avoiding drugs and alcohol, maintaining healthy relationships, and building in time to relax all help promote a healthy lifestyle and general well-being. Concerns about academic performance, health situations, family health and wellness (including the loss of a loved one), interpersonal relationships and commitments, and other factors can contribute to stress. I strongly encourage you to communicate any issues related to your well-being to me or other faculty and staff, and seek support before you experience unmanageable stress or have difficulty with daily functioning. Dr. Leonard Sancilio, Dean of Students (585-245-5706), can assist and provide direction to appropriate campus resources. For more information, see www.geneseo.edu/dean_students.

Mental Health

I consider mental health to be no less important than physical health with respect to learning. As a student, you may experience a range of challenges that can impact your mental health and thus impact your learning; common examples include increased anxiety, shifts in mood, strained relationships, difficulties related to substance use, trouble concentrating, and lack of motivation, among many others. These experiences may reduce your ability to participate fully in daily activities and affect your academic performance. SUNY Geneseo offers free, confidential counseling for students at the Lauderdale Center for Student Health and Counseling (call 585-245-

5716 to make an appointment), and seeking support for your mental health can be key to your success at college. You can learn more about the various mental health services available on campus at health.geneseo.edu.

Food Security

There are resources available for students who are food insecure. If you're unfamiliar with the phrase "food insecurity," you can learn more at the following link on Feeding America's website: Understanding Food Insecurity.

The Pantry at Geneseo, our on campus food pantry, works in partnership with the Geneseo-Groveland Emergency Food Pantry (GGEFP) and is facilitated by interns and volunteers working out of the Office of Student Volunteerism and Community Engagement as well as the School of Business, and the GOLD Leadership and Student Athlete Mentors programs.

Any student who is food insecure can submit a request here: Food Pantry Request Form to receive a bag of food that will provide them with items that will last a few days, including nonperishables and when available fresh fruits, vegetables, meat, and dairy. Once submitted, interns will connect directly with the student to communicate next steps and the time of your pick up. Pickups will take place in the MacVittie College Union, Room 114 - the GOLD Leadership Center.

This program will provide individuals with a bag of food up to once a month. We will do our utmost to ensure anonymity, while also working to destigmatize food insecurity in our community.

Students are also able to access the Geneseo-Groveland Emergency Food Pantry on their own if that is their preference. It is located at 31 Center St. and is open Tuesdays and Thursdays 10 AM - 2 PM and Wednesdays 4 - 6:30 PM.

If you have any questions about this process or anything relating to food insecurity, or have a need beyond what is outlined above, please refer to our website or contact us directly at foodpantry@geneseo.edu / 585-245-5893 or the Dean of Students at 585-245-5706.

Emergency Funding

The college has three sources of emergency funding for students experiencing short-term financial crises. The Camiolo Student Emergency Loan Fund (SELF) provides short-term loans to students for situations both temporary and beyond their control.The SELF was established with the expectation that students who use the fund seek to "pay it forward" as soon as they are able by contributing to the fund so other students can be helped, too. While there is not a legal obligation, the donors hope that student loan recipients respect and honor the value of community and helping others in their time of crisis. The One Knight Student Aid Emergency Fund assists Geneseo students who are facing financial emergencies. The fund offers grants (one-time award) depending on a student's documented financial need. For those students expecting a refund from financial aid, a Temple Hill loan of up to $500 can be offered prior to the approved loan dispersal. If you are experiencing financial hardship, please contact the Dean of Students (585-245-5706), who can assist and provide direction to appropriate campus resources.

Religious Observances and Class Attendance/Deadlines

If you anticipate an absence or conflict with an assignment deadline due to religious observances, please contact me as early in the semester as possible to make alternative arrangements for those days that you'll miss. Student attendance in classes on religious holidays is governed by New York State Education Law 224-a (see https://www.geneseo.edu/apca/classroom-policies). See calendar of major religious observances.

Military Obligations and Class Attendance

Federal and New York State law requires institutions of higher education to provide an excused leave of absence from classes without penalty to students enrolled in the National Guard or armed forces reserves who are called to active duty. If you are called to active military duty and need to miss classes, please let me know and consult as soon as possible with the Dean of Students.

Bias-Related Incidents

"We are here to listen, to learn, to teach, to debate, to change, to grow. We should all be safe to pursue these goals at SUNY Geneseo while being who we are. Together, we commit ourselves to pluralism, cultivating a community that respects difference and promotes a sense of inclusion and belonging." As this excerpt from our Community Commitment to Diversity, Equity, and Inclusion states, here at SUNY Geneseo, we want to provide a space where everyone feels welcome to learn and grow in their identities as well as in their role as students, faculty, and staff. If in the unfortunate instance you experience an incident of bias, we encourage you to reach out to the Chief Diversity Officer (routenberg@geneseo.edu) and/or our University Police Department. In trying to create an environment that facilitates growth through diverse thoughts and ideas, reporting incidents of bias - including threats, vandalism, and microaggressive behaviors - can help bring a better understanding of our campus climate as well as provide opportunities for learning and restoring harm. For ideas, questions, or concerns related to diversity, equity, and inclusion in the Biology Department, please reach out to bio-diversity@geneseo.edu.

Proposed schedule outline

Below is we are aiming for! Assignments will be described in detail on Brightspace. I may adjust the topics and dates during the semester; be assured I will inform you of any changes in a timely fashion.

Jan 22-26

Date	Day	Agenda	What's due (11:59 PM)
1/22	Mon	Introduction to R	
1/23	Tues		
1/24	Wed	Designing Biological Research	
1/25	Thurs		
1/26	Fri		Survey for group assignments

Jan 29 – Feb 2

Date	Day	Agenda	What's due (11:59 PM)
1/29	Mon	Designing Biological Research	Introduction to R tutorial/concept checks
1/30	Tues		
1/31	Wed	Designing Biological Research	
2/1	Thurs		Introduction to R problem set Sign up for live coding quiz time slot
2/2	Fri		

Feb 5 – 9

Date	Day	Agenda	What's due (11:59 PM)
2/5	Mon	Getting to Know the Data	Designing biological research tutorial/concept checks
2/6	Tues		
2/7	Wed	Getting to Know the Data	
2/8	Thurs		
2/9	Fri		

Feb 12 – 16

Date	Day	Agenda	What's due (11:59 PM)
2/12	Mon	The Data Life Cycle	Getting to know the data tutorial/concept checks
2/13	Tues		
2/14	Wed	Live coding quiz 1	
2/15	Thurs		
2/16	Fri		

Feb 19 – 23

Date	Day	Agenda	What's due (11:59 PM)
2/19	Mon	Projects	Data life cycle tutorial/concept checks
2/20	Tues		
2/21	Wed	Projects	
2/22	Thurs		Project literature review
2/23	Fri		

Feb 26 – Mar 1

Date	Day	Agenda	What's due (11:59 PM)
2/26	Mon	Hypothesis Testing	
2/27	Tues		
2/28	Wed	Hypothesis Testing	
2/29	Thurs		Project exploratory data analysis
3/1	Fri		

Mar 4 – 8

Date	Day	Agenda	What's due (11:59 PM)
3/4	Mon	Projects	Hypothesis testing tutorial/concept checks
3/5	Tues		
3/6	Wed	Live coding quiz 2	
3/7	Thurs		Project peer feedback Group member evaluation #1
3/8	Fri		

Mar 11 – 15 (Spring Break)

No class and no deadlines this week

Mar 18 – 22

Date	Day	Agenda	What's due (11:59 PM)
3/18	Mon	Goodness of Fit/Contingency	
3/19	Tues		
3/20	Wed	Goodness of Fit/Contingency	
3/21	Thurs		Preliminary project report
3/22	Fri		

Mar 25 – Mar 29

Date	Day	Agenda	What's due (11:59 PM)
3/25	Mon	Tests of Difference: Two Samples	Goodness of fit and contingency tests tutorial/concept checks
3/26	Tues		
3/27	Wed	Tests of Difference: Two Samples	
3/28	Thurs		Goodness of fit/contingency problem set

3/29	Fri		

Apr 1 – 5

Date	Day	Agenda	What's due (11:59 PM)
4/1	Mon	Tests of Difference: Two or More Samples	Two sample comparisons tutorial/concept checks
4/2	Tues		
4/3	Wed	Live coding quiz 3	
4/4	Thurs		All the statistical tests so far problem set
4/5	Fri		

Apr 8 – 12

Date	Day	Agenda	What's due (11:59 PM)
4/8	Mon	Eclipse, no class	
4/9	Tues		
4/10	Wed	Correlation and Regression	
4/11	Thurs		Two or more sample comparisons tutorial/concept checks
4/12	Fri		

Apr 15 – 19

Date	Day	Agenda	What's due (11:59 PM)
4/15	Mon	Correlation and Regression	All the statistical tests so far problem set
4/16	Tues		
4/17	Wed	Projects	
4/18	Thurs		Correlation and regression tutorial/concept checks
4/19	Fri		

Apr 22 – 26

Date	Day	Agenda	What's due (11:59 PM)
4/22	Mon	Projects	All the statistical tests so far problem set
4/23	Tues		
4/24	Wed	GREAT Day! No class	Participate in GREAT Day!
4/25	Thurs		Updated project analysis plan
4/26	Fri		

Apr 29 – May 3

Date	Day	Agenda	What's due (11:59 PM)
4/29	Mon	Projects	Individual project report
4/30	Tues		
5/1	Wed	Live coding quiz 4	

5/2	Thurs		
5/3	Fri		

May 6 – 10

Date	Day	Agenda	What's due (11:59 PM)
5/6	Mon	Projects	Group project report
5/7	Tues		
5/8	Wed	Projects	
5/9	Thurs		
5/10	Fri		

May 13 – 17

Date	Day	Agenda	What's due (11:59 PM)
5/13	Mon		
5/14	Tues		
5/15	Wed		Group presentation slides
5/16	Thurs	3:30-6:00 PM Project symposium!	Group member evaluation #2
5/17	Fri		