

# Course Syllabus

## COURSE DESCRIPTION

Genetics and genomics have transformed cell biology, and we will investigate how it is revolutionizing ecology & evolution as well. We will learn population genetic theory and the skills to use that theory to understand population dynamics, dispersal, natural selection, and ecological genetics. Basic mathematics and a comfort with algebra will be needed to succeed in this course. A substantial portion of the course will be devoted to a hands-on class research project with a transcriptomics dataset.

## LOGISTICS

Meets 9:15-10:35am Mondays and Thursdays on Zoom

Course website is on Canvas [here](#).

## CONTACT INFORMATION

Instructor: Malin Pinsky

Office Hours: Mondays and Thursdays 10:45am-11:30am

Phone: 202-360-2611

Email: [malin.pinsky@rutgers.edu](mailto:malin.pinsky@rutgers.edu) (<mailto:malin.pinsky@rutgers.edu>)

Grader: Bobby Kwait, Ph.D. student in Ecology & Evolution, [rek89@sebs.rutgers.edu](mailto:rek89@sebs.rutgers.edu) (<mailto:rek89@sebs.rutgers.edu>)

## LEARNING OBJECTIVES

1. You will be able to explain how drift, mutation, migration, and selection shape patterns of variation across the genome
2. You will be able to summarize the strengths and limitations of molecular ecological methods, as well as the scientific questions that can be addressed
3. Starting from raw data, you will be able to perform standard population genetic analyses

## COURSE MATERIALS

Allendorf, Fred W., Gordon Luikart, and Sally N. Aitken. 2013. Conservation and the genetics of populations. 2<sup>nd</sup> Edition. Wiley-Blackwell, West Sussex, UK. Available online through the Rutgers Library [here](https://bit.ly/3fz1z12) (<https://bit.ly/3fz1z12>). *Note: having the second edition is important. You will be responsible for the material in the second edition.*

Other required readings, including primary research papers, will be posted on Canvas.

Pre-recorded lectures will be posted on Canvas. These lectures extend and supplement the reading and so should be watched after the reading.

## **STATEMENT OF DIVERSITY AND INCLUSION**

It is my intention that students of all backgrounds will be well served by this course. We will work together to create an environment of inclusion that respects and affirms the dignity, value, and uniqueness of all individuals, communities and perspectives. We are lucky to have a diverse university. Diverse voices and life experiences enhance the learning process and we welcome students to share their personal experiences. We will not tolerate disrespectful language or behavior against any individual or group. If you feel as though you have been disrespected or treated unfairly by the instructors or any other individual please let me know. You may also report bias to the Rutgers Diversity and Inclusion initiative using [this link](http://inclusion.rutgers.edu/report-bias-incident/) [\(http://inclusion.rutgers.edu/report-bias-incident/\)](http://inclusion.rutgers.edu/report-bias-incident/).

## **LAND ACKNOWLEDGEMENT**

While we may be conducting class online this semester, many of us will be on the traditional homelands of the Lenape people (check here for a [global map](https://native-land.ca/) [\(https://native-land.ca/\)](https://native-land.ca/) of other locations). As well-said by the [Know The Land Territories Campaign](http://www.lspirg.org/knowtheland/) [\(http://www.lspirg.org/knowtheland/\)](http://www.lspirg.org/knowtheland/):

▶ recognize the land is an expression of gratitude and appreciation to those whose territory you reside on, and a way of honoring the Indigenous people who have been living and working on the land from time immemorial. It is important to understand the long-standing history that has brought you to reside on the land, and to seek to understand your place within that history. Land acknowledgements do not exist in a past tense, or historical context: colonialism is a current ongoing process, and we need to build our mindfulness of our present participation. It is also worth noting that acknowledging the land is Indigenous protocol.

## **ASSIGNMENTS/RESPONSIBILITIES**

This course is run as a “flipped classroom,” meaning that you will be responsible for doing the reading and watching pre-recorded lectures as your homework. These will be posted under the Modules tab on Canvas.

In class, we will focus on synthesizing and mastering the material.

Attendance and participation during class meetings is required for everyone to get the most out of this course, and it is therefore a substantial part of your grade. Participation means constructive and insightful contributions to work in pairs and groups, as well as to full class discussions. To participate effectively, you must have done the reading and watched the lectures. Graduate students will generally lead the full class discussions.

Most classes will follow a standard format:

1. We will start each class with a 5-minute quiz on the reading and lectures. This is a motivation for you to come to class prepared.
2. We will then have a question and answer session to clarify any material from the reading or lectures that was confusing. Please write down your questions ahead of time so that we can use this time efficiently (i.e., write down questions while you do the reading and watch the lectures).
3. The remainder of each class period will involve group work on problem sets, group paper discussions, or hands-on data analysis labs. These can usually be completed in class, but are due by midnight the following day if you need more time.
4. As the semester progresses, we will analyze real sequence data from clownfish transcriptomes in the western Pacific. For the final project (see more information below), you will complete your own population genetic research project as a group, write it up, and present it.

## ONLINE NORMS

Despite a semester and a half of practice for some, we are all still learning how to teach and take classes successfully online. We will talk at the start of class about what our general expectations of each other should be, but here are some initial ideas:

- Cameras on while we're in class, unless this is a real hardship given your location or bandwidth. Cameras on is especially important during group work.
- Microphones generally on to facilitate participation, but muted if you have background noise.
- Heads up that the group chat is part of the class record, so please don't put things there you wouldn't want recorded.



## ASSESSMENT

- Class participation 20%
- Daily quizzes 10%
- Problem sets (in pairs) 20%
- Two midterms (open book, completed individually) 20%
- Final presentation and paper (written in pairs) 30%

## ABSENCES

If you have to miss a class for illness or family emergency, please notify Rutgers (<https://sims.rutgers.edu/ssra/>) and email me ahead of time. If you miss a problem set or a lab due to a class absence, it is your responsibility to ask me how to complete the work on your own and turn it in at the next class meeting for up to full credit. Grades on work turned in any later will be reduced by 10% per day.

If you miss a paper discussion, please write up a one-page summary of the paper in your own words and address these questions: 1) What is the general topic? 2) What is the claim being made? 3) What is represented in the figures, what makes sense, and what is confusing? 4) How did they gather these data and what makes sense or is confusing about the methods? 5) Is the claim supported, and why do you think so? 6) Why is this research

important and how does it fit into what is known? 7) What other thoughts on the paper do you have?

## ACADEMIC INTEGRITY


Students will be responsible for adhering to the academic integrity policies found at <http://academicintegrity.rutgers.edu> [\\_\(http://academicintegrity.rutgers.edu\)\\_](http://academicintegrity.rutgers.edu). All instances of plagiarism or other unacceptable and unethical academic conduct will be reported to the Office of Student Conduct or the Graduate School and might result in warnings or suspension according to Rutgers' official rules.

## WELLNESS AND BASIC NEEDS

School and life can be stressful, and Rutgers has many ways to get help. I can help you connect to these resources, but as an instructor, I have a mandatory duty to report some issues and concerns to the appropriate offices at the University. I can offer you privacy and my discretion, but not confidentiality.

Students who are successful tend to seek out resources that enable them to excel academically, maintain their health and wellness, prepare for future careers, navigate college life and finances, and connect with the RU community. Resources that can help you succeed and connect with the Rutgers community can be found at [success.rutgers.edu](http://success.rutgers.edu) [\\_\(http://success.rutgers.edu/\)\\_](http://success.rutgers.edu/), and nearly all services and resources that are typically provided in-person are now available remotely.

For COVID-related information, see <https://coronavirus.rutgers.edu> [\\_\(https://coronavirus.rutgers.edu\)\\_](https://coronavirus.rutgers.edu).

 student who believes their performance in the course is going to be affected by difficulty accessing sufficient food, shelter, technology, or other basic needs is urged to contact me as well as the the [Dean of Students](http://studentaffairs.rutgers.edu) [\\_\(http://studentaffairs.rutgers.edu\)\\_](http://studentaffairs.rutgers.edu) for support.

The Rutgers Student Food Pantry is located at 39 Union Street on the College Avenue Campus. If you have mobility issues please call 848-932-5500 for an appointment and they will make arrangements to meet you at another location on campus. A 2018 survey found that 1/3 of all students at Rutgers have experienced food insecurity at some point during the semester. You are not alone and we are here to help.

If you have technological difficulties with remote learning, please also contact the [Dean of Students](http://studentaffairs.rutgers.edu) [\\_\(http://studentaffairs.rutgers.edu\)\\_](http://studentaffairs.rutgers.edu) for support and they can guide you to the right resource.

If you need help with stress or mental health, contact [Rutgers Counseling Services](http://health.rutgers.edu/medical-counseling-services/counseling) [\\_\(http://health.rutgers.edu/medical-counseling-services/counseling\)\\_](http://health.rutgers.edu/medical-counseling-services/counseling).

For relationship violence and related concerns, contact the [Office for Violence Prevention and Victim Assistance](http://vpva.rutgers.edu) [\\_\(http://vpva.rutgers.edu\)\\_](http://vpva.rutgers.edu).

For disability assistance, the [Office of Disability Services](https://ods.rutgers.edu) [\\_\(https://ods.rutgers.edu\)\\_](https://ods.rutgers.edu) can help.

**COURSE SCHEDULE**

#	Date and Location	Topic	Due Dates
1	Th 1/21	Introduction	
2	M 1/25	Genetic variation and probability	
3	Th 1/28	Barcoding and genetic distances	
4	M 2/1	Metagenomics	
5	Th 2/4	Parentage & kinship	
6	M 2/8	Hardy Weinberg Principle (HWP)	
7	Th 2/11	Genetic drift and mutation	
▶			
8	M 2/15	Effective population size ( $N_e$ )	Midterm 1 available
9	Th 2/18	Introduction to final project	Midterm 1 due before class
10	M 2/22	Selection theory	
11	Th 2/25	Selection applications	
12	M 3/1	Detecting local adaptation	
13	Th 3/4	Migration theory	
14	M 3/8	Exploratory	

		population structure	
15	Th 3/11	Approximate Bayesian Computation (ABC)	
	M 3/15	SPRING BREAK	
	Th 3/18	SPRING BREAK	
16	M 3/22	Contemporary migration	
17	Th 3/25	Multiple loci	Project proposals due
18	M 3/29	Quantitative genetics	
19	Th 4/1	The coalescent	Midterm 2 available
	M 4/5	Final project	Midterm 2 due before class
21	Th 4/8	Transcriptomics	
22	M 4/12	Final project	
23	Th 4/15	Phylogeography	
24	M 4/19	Final project	
25	Th 4/22	Ancient DNA	
26	M 4/26	Ecogenomics	
27	Th 4/29	Final project presentations	
28	M 5/3	Final project	

		presentations	
	Th 5/6		Final paper DUE by 5pm ET

## FINAL PROJECT

Throughout the semester, we will be analyzing sequence data from clownfish transcriptomes. For the final paper, your assignment will be to pick a molecular ecology question that interests you, and then choose an appropriate population genetic analysis for that question. In a group, you will learn how to conduct the analysis, apply it to our dataset, write a research paper describing your results, and present your research to the class. Groups will be pre-assigned.

To start choosing a topic, you will develop paper proposals as 2-5 sentences describing the question and methods you think you'd like to use.

A 12-minute talk with slides (Powerpoint or PDF) to explain your project and what you found. Each talk will be followed by a 5-minute question and answer session.

### Paper Format

8-12 pages, single spaced, Times New Roman 12 point font

Acceptable file formats: .doc, .docx, or .pdf

Grades for late papers will be reduced by 30% per 24 hours

Molecular Ecology "Original Article" format (<http://bit.ly/1PQji3A> [. \(http://bit.ly/1PQji3A\)](http://bit.ly/1PQji3A))

*Abstract:* Briefly describes the purpose, methods, results, and conclusions of your paper

*Introduction:* Describes why the topic is important, provides background information, and states the specific question or hypothesis addressed in the paper

*Methods:* Details about the analysis you did and how you did it, so that someone else could fully replicate your results. You should include the precise commands that you ran for your analysis (this can be a supplement to the paper if easier)

*Results:* Presents what you found (including in tables and figures), but does not interpret the findings










*Discussion:* Describes your interpretation of your findings and how they related to other studies

*References:* 15+ references. Follow Molecular Ecology format.














## \* CORRECTION TO THE READINGS













- Allendorf 7.7: The equation for  $N_e(nuc)/N_e(mt)$  is incorrect. It should be  $\frac{N_e(nuc)}{N_e(mt)} = \frac{4N_f N_m}{N_f + N_m}$













## Course Summary:












Date	Details	Due
Thu Jan 21, 2021	 <a href="#">2021SP - Molecular Ecology and Population Genetics 11:216:454 and 16:215:554</a> ( <a href="https://rutgers.instructure.com/calendar?event_id=298045&amp;include_contexts=course_109769">https://rutgers.instructure.com/calendar?event_id=298045&amp;include_contexts=course_109769</a> )	9am to 11am
 Jan 25, 2021	 <a href="#">2021SP - Molecular Ecology and Population Genetics 11:216:454 and 16:215:554</a> ( <a href="https://rutgers.instructure.com/calendar?event_id=298046&amp;include_contexts=course_109769">https://rutgers.instructure.com/calendar?event_id=298046&amp;include_contexts=course_109769</a> )	9am to 11am
	 <a href="#">Quiz 2</a> ( <a href="https://rutgers.instructure.com/courses/109769/assignments/1208585">https://rutgers.instructure.com/courses/109769/assignments/1208585</a> )	due by 9:25am
	 <a href="#">Participation 1/25</a> ( <a href="https://rutgers.instructure.com/courses/109769/assignments/1253707">https://rutgers.instructure.com/courses/109769/assignments/1253707</a> )	due by 11pm
Tue Jan 26, 2021	 <a href="#">Problem Set: Genetic variation and Probability</a> ( <a href="https://rutgers.instructure.com/courses/109769/assignments/1254474">https://rutgers.instructure.com/courses/109769/assignments/1254474</a> )	due by 11:59pm
Thu Jan 28, 2021	 <a href="#">2021SP - Molecular Ecology and Population Genetics 11:216:454 and 16:215:554</a> ( <a href="https://rutgers.instructure.com/calendar?event_id=298047&amp;include_contexts=course_109769">https://rutgers.instructure.com/calendar?event_id=298047&amp;include_contexts=course_109769</a> )	9am to 11am
	 <a href="#">Quiz 3</a> ( <a href="https://rutgers.instructure.com/courses/109769/assignments/1262113">https://rutgers.instructure.com/courses/109769/assignments/1262113</a> )	due by 9:25am
Fri Jan 29, 2021	 <a href="#">Lab: Barcoding and Genetic Distances 1/28</a> ( <a href="https://rutgers.instructure.com/courses/109769/assignments/1261851">https://rutgers.instructure.com/courses/109769/assignments/1261851</a> )	due by 11:59pm


























Date	Details	Due
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1261864">Participation 1/28</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1261864">Participation 1/28</a>	due by 11:59pm
Mon Feb 1, 2021	 <a href="https://rutgers.instructure.com/calendar?event_id=298048&amp;include_contexts=course_109769">2021SP - Molecular Ecology and Population Genetics 11:216:454 and 16:215:554</a> <a href="https://rutgers.instructure.com/calendar?event_id=298048&amp;include_contexts=course_109769">2021SP - Molecular Ecology and Population Genetics 11:216:454 and 16:215:554</a>	9am to 11am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1265964">Quiz 4</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1265964">Quiz 4</a>	due by 9:25am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1267043">Participation 2/1</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1267043">Participation 2/1</a>	due by 11:59pm
Thu Feb 4, 2021	 <a href="https://rutgers.instructure.com/calendar?event_id=298049&amp;include_contexts=course_109769">2021SP - Molecular Ecology and Population Genetics 11:216:454 and 16:215:554</a> <a href="https://rutgers.instructure.com/calendar?event_id=298049&amp;include_contexts=course_109769">2021SP - Molecular Ecology and Population Genetics 11:216:454 and 16:215:554</a>	9am to 11am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1271384">Quiz 5</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1271384">Quiz 5</a>	due by 9:25am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1271382">Participation 2/4</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1271382">Participation 2/4</a>	due by 11:59pm
Fri Feb 5, 2021	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1271818">Problem Set: Parentage and kinship</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1271818">Problem Set: Parentage and kinship</a>	due by 11:59pm
Mon Feb 8, 2021	 <a href="https://rutgers.instructure.com/calendar?event_id=298050&amp;include_contexts=course_109769">2021SP - Molecular Ecology and Population Genetics 11:216:454 and 16:215:554</a> <a href="https://rutgers.instructure.com/calendar?event_id=298050&amp;include_contexts=course_109769">2021SP - Molecular Ecology and Population Genetics 11:216:454 and 16:215:554</a>	9am to 11am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1274256">Quiz 6</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1274256">Quiz 6</a>	due by 9:25am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1274265">Participation 2/8</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1274265">Participation 2/8</a>	due by 11:59pm
Tue Feb 9, 2021	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1274399">Lab: Hardy-Weinberg Proportions</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1274399">Lab: Hardy-Weinberg Proportions</a>	due by 11:59pm













Date	Details	Due
Thu Feb 11, 2021	 <a href="https://rutgers.instructure.com/calendar?event_id=298051&amp;include_contexts=course_109769">2021SP - Molecular Ecology and Population Genetics 11:216:454 and 16:215:554</a> <a href="https://rutgers.instructure.com/calendar?event_id=298051&amp;include_contexts=course_109769">(https://rutgers.instructure.com/calendar?event_id=298051&amp;include_contexts=course_109769)</a>	9am to 11am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1277050">Quiz 7</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1277050">(https://rutgers.instructure.com/courses/109769/assignments/1277050)</a>	due by 9:25am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1277822">Participation 2/11</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1277822">(https://rutgers.instructure.com/courses/109769/assignments/1277822)</a>	due by 11:59pm
Fri Feb 12, 2021	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1275602">Lab: Genetic Drift</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1275602">(https://rutgers.instructure.com/courses/109769/assignments/1275602)</a>	due by 11:59pm
Mon Feb 15, 2021	 <a href="https://rutgers.instructure.com/calendar?event_id=298052&amp;include_contexts=course_109769">2021SP - Molecular Ecology and Population Genetics 11:216:454 and 16:215:554</a> <a href="https://rutgers.instructure.com/calendar?event_id=298052&amp;include_contexts=course_109769">(https://rutgers.instructure.com/calendar?event_id=298052&amp;include_contexts=course_109769)</a>	9am to 11am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1281172">Quiz 8</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1281172">(https://rutgers.instructure.com/courses/109769/assignments/1281172)</a>	due by 9:25am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1281213">Participation 2/15</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1281213">(https://rutgers.instructure.com/courses/109769/assignments/1281213)</a>	due by 11:59pm
Thu Feb 18, 2021	 <a href="https://rutgers.instructure.com/calendar?event_id=298053&amp;include_contexts=course_109769">2021SP - Molecular Ecology and Population Genetics 11:216:454 and 16:215:554</a> <a href="https://rutgers.instructure.com/calendar?event_id=298053&amp;include_contexts=course_109769">(https://rutgers.instructure.com/calendar?event_id=298053&amp;include_contexts=course_109769)</a>	9am to 11am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1281509">Midterm 1</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1281509">(https://rutgers.instructure.com/courses/109769/assignments/1281509)</a>	due by 9:15am
Mon Feb 22, 2021	 <a href="https://rutgers.instructure.com/calendar?event_id=298054&amp;include_contexts=course_109769">2021SP - Molecular Ecology and Population Genetics 11:216:454 and 16:215:554</a> <a href="https://rutgers.instructure.com/calendar?event_id=298054&amp;include_contexts=course_109769">(https://rutgers.instructure.com/calendar?event_id=298054&amp;include_contexts=course_109769)</a>	9am to 11am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1288255">Quiz 9</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1288255">(https://rutgers.instructure.com/courses/109769/assignments/1288255)</a>	due by 9:25am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1288313">Participation 2/22</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1288313">(https://rutgers.instructure.com/courses/109769/assignments/1288313)</a>	due by 11:59pm








Date	Details	Due
Tue Feb 23, 2021	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1288457">Problem Set: Selection</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1288457">(<a href="https://rutgers.instructure.com/courses/109769/assignments/1288457">https://rutgers.instructure.com/courses/109769/assignments/1288457</a>)</a>	due by 11:59pm
Thu Feb 25, 2021	 <a href="https://rutgers.instructure.com/calendar?event_id=298055&amp;include_contexts=course_109769">2021SP - Molecular Ecology and Population Genetics 11:216:454 and 16:215:554</a> <a href="https://rutgers.instructure.com/calendar?event_id=298055&amp;include_contexts=course_109769">(<a href="https://rutgers.instructure.com/calendar?event_id=298055&amp;include_contexts=course_109769">https://rutgers.instructure.com/calendar?event_id=298055&amp;include_contexts=course_109769</a>)</a>	9am to 11am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1303516">Quiz 10</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1303516">(<a href="https://rutgers.instructure.com/courses/109769/assignments/1303516">https://rutgers.instructure.com/courses/109769/assignments/1303516</a>)</a>	due by 9:25am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1303623">Participation 2/25</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1303623">(<a href="https://rutgers.instructure.com/courses/109769/assignments/1303623">https://rutgers.instructure.com/courses/109769/assignments/1303623</a>)</a>	due by 11:59pm
Mon Mar 1, 2021	 <a href="https://rutgers.instructure.com/calendar?event_id=298056&amp;include_contexts=course_109769">2021SP - Molecular Ecology and Population Genetics 11:216:454 and 16:215:554</a> <a href="https://rutgers.instructure.com/calendar?event_id=298056&amp;include_contexts=course_109769">(<a href="https://rutgers.instructure.com/calendar?event_id=298056&amp;include_contexts=course_109769">https://rutgers.instructure.com/calendar?event_id=298056&amp;include_contexts=course_109769</a>)</a>	9am to 11am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1306675">Quiz 11</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1306675">(<a href="https://rutgers.instructure.com/courses/109769/assignments/1306675">https://rutgers.instructure.com/courses/109769/assignments/1306675</a>)</a>	due by 9:25am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1306693">Participation 3/1</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1306693">(<a href="https://rutgers.instructure.com/courses/109769/assignments/1306693">https://rutgers.instructure.com/courses/109769/assignments/1306693</a>)</a>	due by 11:59pm
Tue Mar 2, 2021	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1305713">Lab: FST outliers</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1305713">(<a href="https://rutgers.instructure.com/courses/109769/assignments/1305713">https://rutgers.instructure.com/courses/109769/assignments/1305713</a>)</a>	due by 11:59pm
Thu Mar 4, 2021	 <a href="https://rutgers.instructure.com/calendar?event_id=298057&amp;include_contexts=course_109769">2021SP - Molecular Ecology and Population Genetics 11:216:454 and 16:215:554</a> <a href="https://rutgers.instructure.com/calendar?event_id=298057&amp;include_contexts=course_109769">(<a href="https://rutgers.instructure.com/calendar?event_id=298057&amp;include_contexts=course_109769">https://rutgers.instructure.com/calendar?event_id=298057&amp;include_contexts=course_109769</a>)</a>	9am to 11am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1309981">Quiz 12</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1309981">(<a href="https://rutgers.instructure.com/courses/109769/assignments/1309981">https://rutgers.instructure.com/courses/109769/assignments/1309981</a>)</a>	due by 9:25am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1310042">Participation 3/4</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1310042">(<a href="https://rutgers.instructure.com/courses/109769/assignments/1310042">https://rutgers.instructure.com/courses/109769/assignments/1310042</a>)</a>	due by 11:59pm
Fri Mar 5, 2021	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1310133">Lab: AMOVA and FST</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1310133">(<a href="https://rutgers.instructure.com/courses/109769/assignments/1310133">https://rutgers.instructure.com/courses/109769/assignments/1310133</a>)</a>	due by 11:59pm

Date	Details	Due
Mon Mar 8, 2021	 <a href="https://rutgers.instructure.com/calendar?event_id=298058&amp;include_contexts=course_109769">2021SP - Molecular Ecology and Population Genetics 11:216:454 and 16:215:554</a> <a href="https://rutgers.instructure.com/calendar?event_id=298058&amp;include_contexts=course_109769">(https://rutgers.instructure.com/calendar?event_id=298058&amp;include_contexts=course_109769)</a>	9am to 11am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1312906">Quiz 13</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1312906">(https://rutgers.instructure.com/courses/109769/assignments/1312906)</a>	due by 9:25am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1313035">Participation 3/8</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1313035">(https://rutgers.instructure.com/courses/109769/assignments/1313035)</a>	due by 11:59pm
Tue Mar 9, 2021	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1313107">Lab: PCA</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1313107">(https://rutgers.instructure.com/courses/109769/assignments/1313107)</a>	due by 11:59pm
Thu Mar 11, 2021	 <a href="https://rutgers.instructure.com/calendar?event_id=298059&amp;include_contexts=course_109769">2021SP - Molecular Ecology and Population Genetics 11:216:454 and 16:215:554</a> <a href="https://rutgers.instructure.com/calendar?event_id=298059&amp;include_contexts=course_109769">(https://rutgers.instructure.com/calendar?event_id=298059&amp;include_contexts=course_109769)</a>	9am to 11am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1322401">Quiz 14</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1322401">(https://rutgers.instructure.com/courses/109769/assignments/1322401)</a>	due by 9:25am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1322402">Participation 3/11</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1322402">(https://rutgers.instructure.com/courses/109769/assignments/1322402)</a>	due by 11:59pm
Fri Mar 12, 2021	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1312744">Lab: ABC</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1312744">(https://rutgers.instructure.com/courses/109769/assignments/1312744)</a>	due by 11:59pm
Mon Mar 15, 2021	 <a href="https://rutgers.instructure.com/calendar?event_id=298060&amp;include_contexts=course_109769">2021SP - Molecular Ecology and Population Genetics 11:216:454 and 16:215:554</a> <a href="https://rutgers.instructure.com/calendar?event_id=298060&amp;include_contexts=course_109769">(https://rutgers.instructure.com/calendar?event_id=298060&amp;include_contexts=course_109769)</a>	9am to 11am
Thu Mar 18, 2021	 <a href="https://rutgers.instructure.com/calendar?event_id=298061&amp;include_contexts=course_109769">2021SP - Molecular Ecology and Population Genetics 11:216:454 and 16:215:554</a> <a href="https://rutgers.instructure.com/calendar?event_id=298061&amp;include_contexts=course_109769">(https://rutgers.instructure.com/calendar?event_id=298061&amp;include_contexts=course_109769)</a>	9am to 11am
Mon Mar 22, 2021	 <a href="https://rutgers.instructure.com/calendar?event_id=298062&amp;include_contexts=course_109769">2021SP - Molecular Ecology and Population Genetics 11:216:454 and 16:215:554</a> <a href="https://rutgers.instructure.com/calendar?event_id=298062&amp;include_contexts=course_109769">(https://rutgers.instructure.com/calendar?event_id=298062&amp;include_contexts=course_109769)</a>	9am to 11am

Date	Details	Due
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1331319">Quiz 15</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1331319">https://rutgers.instructure.com/courses/109769/assignments/1331319</a>	due by 9:25am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1331333">Participation 3/22</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1331333">https://rutgers.instructure.com/courses/109769/assignments/1331333</a>	due by 11:59pm
Tue Mar 23, 2021	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1322692">Problem Set: Contemporary Migration</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1322692">https://rutgers.instructure.com/courses/109769/assignments/1322692</a>	due by 11:59pm
	 <a href="https://rutgers.instructure.com/calendar?event_id=298063&amp;include_contexts=course_109769">2021SP - Molecular Ecology and Population Genetics 11:216:454 and 16:215:554</a> <a href="https://rutgers.instructure.com/calendar?event_id=298063&amp;include_contexts=course_109769">https://rutgers.instructure.com/calendar?event_id=298063&amp;include_contexts=course_109769</a>	9am to 11am
Thu Mar 25, 2021	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1334613">Quiz 16</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1334613">https://rutgers.instructure.com/courses/109769/assignments/1334613</a>	due by 9:25am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1331525">Final project topic</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1331525">https://rutgers.instructure.com/courses/109769/assignments/1331525</a>	due by 11:59pm
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1334629">Participation 3/25</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1334629">https://rutgers.instructure.com/courses/109769/assignments/1334629</a>	due by 11:59pm
Fri Mar 26, 2021	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1334557">Problem Set: Multiple Loci</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1334557">https://rutgers.instructure.com/courses/109769/assignments/1334557</a>	due by 11:59pm
Mon Mar 29, 2021	 <a href="https://rutgers.instructure.com/calendar?event_id=298064&amp;include_contexts=course_109769">2021SP - Molecular Ecology and Population Genetics 11:216:454 and 16:215:554</a> <a href="https://rutgers.instructure.com/calendar?event_id=298064&amp;include_contexts=course_109769">https://rutgers.instructure.com/calendar?event_id=298064&amp;include_contexts=course_109769</a>	9am to 11am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1337175">Quiz 17</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1337175">https://rutgers.instructure.com/courses/109769/assignments/1337175</a>	due by 9:25am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1337198">Participation 3/29</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1337198">https://rutgers.instructure.com/courses/109769/assignments/1337198</a>	due by 11:59pm
Tue Mar 30, 2021	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1335778">Problem Set: Quantitative Genetics</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1335778">https://rutgers.instructure.com/courses/109769/assignments/1335778</a>	due by 11:59pm

Date	Details	Due
Thu Apr 1, 2021	 <a href="https://rutgers.instructure.com/calendar?event_id=298065&amp;include_contexts=course_109769">2021SP - Molecular Ecology and Population Genetics 11:216:454 and 16:215:554</a> <a href="https://rutgers.instructure.com/calendar?event_id=298065&amp;include_contexts=course_109769">(https://rutgers.instructure.com/calendar?event_id=298065&amp;include_contexts=course_109769)</a>	9am to 11am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1339947">Quiz 18</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1339947">(https://rutgers.instructure.com/courses/109769/assignments/1339947)</a>	due by 9:25am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1339963">Participation 4/1</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1339963">(https://rutgers.instructure.com/courses/109769/assignments/1339963)</a>	due by 11:59pm
Mon Apr 5, 2021	 <a href="https://rutgers.instructure.com/calendar?event_id=298066&amp;include_contexts=course_109769">2021SP - Molecular Ecology and Population Genetics 11:216:454 and 16:215:554</a> <a href="https://rutgers.instructure.com/calendar?event_id=298066&amp;include_contexts=course_109769">(https://rutgers.instructure.com/calendar?event_id=298066&amp;include_contexts=course_109769)</a>	9am to 11am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1340922">Midterm 2</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1340922">(https://rutgers.instructure.com/courses/109769/assignments/1340922)</a>	due by 9:15am
Thu Apr 8, 2021	 <a href="https://rutgers.instructure.com/calendar?event_id=298067&amp;include_contexts=course_109769">2021SP - Molecular Ecology and Population Genetics 11:216:454 and 16:215:554</a> <a href="https://rutgers.instructure.com/calendar?event_id=298067&amp;include_contexts=course_109769">(https://rutgers.instructure.com/calendar?event_id=298067&amp;include_contexts=course_109769)</a>	9am to 11am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1347383">Quiz 19</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1347383">(https://rutgers.instructure.com/courses/109769/assignments/1347383)</a>	due by 9:25am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1347431">Participation 4/8</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1347431">(https://rutgers.instructure.com/courses/109769/assignments/1347431)</a>	due by 11:59pm
Fri Apr 9, 2021	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1346654">Problem Set: Transcriptomics</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1346654">(https://rutgers.instructure.com/courses/109769/assignments/1346654)</a>	due by 11:59pm
Mon Apr 12, 2021	 <a href="https://rutgers.instructure.com/calendar?event_id=298068&amp;include_contexts=course_109769">2021SP - Molecular Ecology and Population Genetics 11:216:454 and 16:215:554</a> <a href="https://rutgers.instructure.com/calendar?event_id=298068&amp;include_contexts=course_109769">(https://rutgers.instructure.com/calendar?event_id=298068&amp;include_contexts=course_109769)</a>	9am to 11am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1351821">Participation 4/12</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1351821">(https://rutgers.instructure.com/courses/109769/assignments/1351821)</a>	due by 11:59pm

Date	Details	Due
Thu Apr 15, 2021	 <a href="https://rutgers.instructure.com/calendar?event_id=298069&amp;include_contexts=course_109769">2021SP - Molecular Ecology and Population Genetics 11:216:454 and 16:215:554</a> <a href="https://rutgers.instructure.com/calendar?event_id=298069&amp;include_contexts=course_109769">(https://rutgers.instructure.com/calendar?event_id=298069&amp;include_contexts=course_109769)</a>	9am to 11am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1354435">Quiz 20</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1354435">(https://rutgers.instructure.com/courses/109769/assignments/1354435)</a>	due by 9:25am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1354456">Participation 4/15</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1354456">(https://rutgers.instructure.com/courses/109769/assignments/1354456)</a>	due by 11:59pm
Fri Apr 16, 2021	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1354537">Problem Set: Phylogenetics</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1354537">(https://rutgers.instructure.com/courses/109769/assignments/1354537)</a>	due by 11:59pm
Mon Apr 19, 2021	 <a href="https://rutgers.instructure.com/calendar?event_id=298070&amp;include_contexts=course_109769">2021SP - Molecular Ecology and Population Genetics 11:216:454 and 16:215:554</a> <a href="https://rutgers.instructure.com/calendar?event_id=298070&amp;include_contexts=course_109769">(https://rutgers.instructure.com/calendar?event_id=298070&amp;include_contexts=course_109769)</a>	9am to 11am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1358038">Participation 4/19</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1358038">(https://rutgers.instructure.com/courses/109769/assignments/1358038)</a>	due by 11:59pm
Thu Apr 22, 2021	 <a href="https://rutgers.instructure.com/calendar?event_id=298071&amp;include_contexts=course_109769">2021SP - Molecular Ecology and Population Genetics 11:216:454 and 16:215:554</a> <a href="https://rutgers.instructure.com/calendar?event_id=298071&amp;include_contexts=course_109769">(https://rutgers.instructure.com/calendar?event_id=298071&amp;include_contexts=course_109769)</a>	9am to 11am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1360154">Quiz 21</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1360154">(https://rutgers.instructure.com/courses/109769/assignments/1360154)</a>	due by 9:25am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1360183">Participation 4/22</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1360183">(https://rutgers.instructure.com/courses/109769/assignments/1360183)</a>	due by 11:59pm
Mon Apr 26, 2021	 <a href="https://rutgers.instructure.com/calendar?event_id=298072&amp;include_contexts=course_109769">2021SP - Molecular Ecology and Population Genetics 11:216:454 and 16:215:554</a> <a href="https://rutgers.instructure.com/calendar?event_id=298072&amp;include_contexts=course_109769">(https://rutgers.instructure.com/calendar?event_id=298072&amp;include_contexts=course_109769)</a>	9am to 11am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1364490">Quiz 22</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1364490">(https://rutgers.instructure.com/courses/109769/assignments/1364490)</a>	due by 9:25am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1364543">Participation 4/26</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1364543">(https://rutgers.instructure.com/courses/109769/assignments/1364543)</a>	due by 11:59pm

Date	Details	Due
Thu Apr 29, 2021	 <a href="https://rutgers.instructure.com/calendar?event_id=298073&amp;include_contexts=course_109769">2021SP - Molecular Ecology and Population Genetics 11:216:454 and 16:215:554</a> <a href="https://rutgers.instructure.com/calendar?event_id=298073&amp;include_contexts=course_109769">(https://rutgers.instructure.com/calendar?event_id=298073&amp;include_contexts=course_109769)</a>	9am to 11am
Mon May 3, 2021	 <a href="https://rutgers.instructure.com/calendar?event_id=298074&amp;include_contexts=course_109769">2021SP - Molecular Ecology and Population Genetics 11:216:454 and 16:215:554</a> <a href="https://rutgers.instructure.com/calendar?event_id=298074&amp;include_contexts=course_109769">(https://rutgers.instructure.com/calendar?event_id=298074&amp;include_contexts=course_109769)</a>	9am to 11am
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1364910">Final presentation</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1364910">(https://rutgers.instructure.com/courses/109769/assignments/1364910)</a>	due by 11:59pm
Thu May 6, 2021	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1364923">Final paper</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1364923">(https://rutgers.instructure.com/courses/109769/assignments/1364923)</a>	due by 5pm
Sun May 9, 2021	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1377619">Coalescent</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1377619">(https://rutgers.instructure.com/courses/109769/assignments/1377619)</a>	due by 11:59pm
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1371094">Participation 4/29</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1371094">(https://rutgers.instructure.com/courses/109769/assignments/1371094)</a>	
	 <a href="https://rutgers.instructure.com/courses/109769/assignments/1373946">Participation 5/3</a> <a href="https://rutgers.instructure.com/courses/109769/assignments/1373946">(https://rutgers.instructure.com/courses/109769/assignments/1373946)</a>	

