This course will introduce you to genetic tools and analyses and how they have been applied to habitat conservation, harvesting, captive breeding programs, invasive species, and forensics. The optional laboratory provides hands-on training of open-source analytical software and published and unpublished datasets.

**Instructor:** Professor Erik Sotka  
**Email:** SotkaE@cofc.edu  
**Office Hours:** 8:30-9:15 AM Tuesdays and Thursdays RITA 226 or 228  
**Communication:** The best way to get a hold of me is through my email. I will respond to you within 24 hours during the weekdays, and on or before Monday if you email after 5pm Friday.

**Prerequisites:** Biology 111/111L, 112/112L and 211/211D or 213/213D.

**Required reading:**
- OAKS will be used for this course throughout the semester to provide the syllabus and class materials

**Lecture (3 credit)** For the first two months, I will describe the genetic tools and theory for conservation in both lectures per week. For the remainder of the course, I will introduce topics of conservation during one lecture, and we will discuss articles or have a Mini-lecture by graduate students for the 2nd lecture period per week.

**Laboratory (1 credit)** We are officially in the laboratory for 3 hours per week. The laboratory portion requires computer work, and thus access to a laptop is required.

**Student Learning Outcomes**

1) To understand the strengths and limitations of genetic tools, and how these genetic tools are useful to questions of conservation  
2) To understand how to use open-source software in R and its use in analyzing population genetics and phylogenetic questions  
3) To gain an appreciation of the modern state of the field in conservation genetics  
4) To critically read, criticize and discuss peer-reviewed papers

**Attendance policy – COVID-specific** This is a hybrid learning course with both face-to-face and online components. Due to social distancing requirements, this class will include a variety of online and technology enhanced components to reinforce continuity of learning for all enrolled students. Before the drop/add deadline, students should decide whether the course plan on the syllabus matches their own circumstances.

- All Lectures will be available live-streamed. Everyone is expected to watch the live-
stream if you are not in class.

- All laboratories are online (2-5pm Tuesdays)

**Attendance Policy - general** Miss lecture? Get notes and handouts from another student (note,
exam questions come from lecture as well as the text). If you have any conflicts with the scheduled
exams, you must see me ahead of time, well before the exam date.

**Grade LECTURE**
Weekly quizzes / short answer (20%)
Discussion lead and DQs (DQs; 30%)
Take-home midterms (2; 25% each = 50%)

**Grade LABORATORY**
Weekly Homework (50%)

*Final exam - practical (50%)* - This exam ensured you understand the basic toolkit and analyses
that you find in a peer-reviewed journal like *Molecular Ecology*. You will find an article that has all
(most) of its data freely available at publicly available servers (e.g., Dryad or GenBank). If the data
aren’t available, then you can email the corresponding author and ask for the raw dataset. You will
then be required to re-generate several (i envision three) analyses that were in the paper. The
output is an oral presentation at the end of the semester of the two articles...what was interesting
and important about the paper, its principal findings, its weaknesses, etc...

**Grading Scale:**
- 93 and above: A
- 90-92.9: A-
- 87-89.9: B+
- 83-86.9: B
- 80-82.9: B-
- 77-79.9: C+
- 73-76.9: C
- 70-72.9: C-
- 67-69.9: D+
- 63-66.9: D
- 60-62.9: D-
- below 60: F

**Assignments and late policy:** Assignments will be turned in on time to be considered for full credit.
A loss of 5% will be deducted per school day for any late assignment. Zero points will be recorded
for an assignment if it is not turned in before the assignment is passed back, discussed in class or
key posted. Suitable means to turn in assignment via OAKS or email directly to the instructor
(SotkaE@cofc.edu).

**Computers:** Unless you are told otherwise, all assignments should be completed on a computer.

**Honor Code:** We follow all aspects of the College of Charleston Honor Code (see
https://deanofstudents.cofc.edu/honor-system/).

**American with Disabilities Act:** Any persons with disabilities are entitled to access, support, and
reasonable accommodations in this course.
### Schedule (tentative)

All reading assignments are for the Allendorf et al. book, except where noted.

<table>
<thead>
<tr>
<th>Week</th>
<th>Tuesday.Date</th>
<th>Lecture</th>
<th>Readings</th>
<th>Laboratory</th>
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<td>12-Jan</td>
<td>Intro; History of Mol Ecol</td>
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<td>Intro to R</td>
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<td>2</td>
<td>19-Jan</td>
<td>Genetic toolkit; HWE</td>
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<td>Genetic diversity</td>
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<td>3</td>
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<td>Genetic drift</td>
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<td>4</td>
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<td>Fst and structure</td>
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<td>Fstats</td>
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<td>5</td>
<td>9-Feb</td>
<td>Selection</td>
<td>8,10</td>
<td>Outlier tests</td>
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<tr>
<td>6</td>
<td>16-Feb</td>
<td>Phylogenies; speciation</td>
<td>PH 2,5,6</td>
<td>Phylogenies</td>
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<td>7</td>
<td>23-Feb</td>
<td>Ne</td>
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<td>8</td>
<td>2-Mar</td>
<td>No class</td>
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<td>No class</td>
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<tr>
<td>9</td>
<td>9-Mar</td>
<td>Dispersal and metapop'ns***</td>
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<td>PRACTICAL</td>
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<tr>
<td>12</td>
<td>30-Mar</td>
<td>Forensics and monitoring***</td>
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<td>Exploited populations***</td>
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<td>Invasive species***</td>
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<td>PRACTICAL</td>
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<tr>
<td>15</td>
<td>20-Apr</td>
<td>Presentation</td>
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FINAL = Take-home midterm