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 The optional laboratory provides hands-on training of open-source analytical software and published and unpublished datasets.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:** 1:00-2:00 PM Mondays and Wednesdays via Zoom ([https://cofc.zoom.us/j/3987124212](https://cofc.zoom.us/j/3987124212))  
**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:**  
- Readings (found on OAKS)  

**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 (Lecture)**  
1) To describe how genetic tools are useful to questions of conservation  
2) To describe the modern state of the field in conservation genetics  
3) To read and participate in discussion of peer-reviewed papers

**Student Learning Outcomes (Laboratory)**  
1) To demonstrate basic use of open-source statistical software in R  
2) Use R to analyze population genetics problems  
3) Use R to analyze phylogenetic questions  
4) Demonstrate continued development of oral communication skills
Attendance policy: This course is face-to-face and as such, I will be focusing Lectures and Laboratories in class. These lectures will not be live-streamed. If you are unable to attend Lecture because of illness of any kind, then you are expected to watch and listen to the Lecture recording later (email me for the link), take notes and email / ask me any questions you may have. Recordings are available for those that are unable to come to class because of illness of any kind. Before the drop/add deadline, students should decide whether the course plan on the syllabus matches their own circumstances.

Grade (Lecture)
Weekly homework (25 pts X 6 = 150 pts)
Discussion preparation (25 pts X 6 = 150 pts)
Midterms (75 pts X 2=150 pts)
Total = 450 pts

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 be required to generate several analyses that we were trained on this semester. The output is an oral presentation at the end of the semester…what was interesting and important about the paper, its principal findings, its weaknesses, etc…

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

OAKS: OAKS, including Gradebook, will be used for this course throughout the semester to provide the syllabus and class materials and grades for each assignment, which will be regularly posted.

Academic Integrity Statement: the College of Charleston expects that every student and community member has a responsibility to uphold the standards of the honor code, as outlined in the Student Handbook

Accommodations for Students with Disabilities: Any student eligible for and needing
accommodations because of a disability is requested to speak with the professor during the first two weeks of class or as soon as the student has been approved for services so that reasonable accommodations can be arranged. The Center for Disability Services/SNAP is committed to assisting qualified students with disabilities achieve their academic goals by providing reasonable academic accommodations under appropriate circumstances Center for Disability Services/SNAP website.

Inclement Weather, Pandemic or Substantial Interruption of Instruction: If in-person classes are suspended, faculty will announce to their students a detailed plan for a change in modality to ensure the continuity of learning. All students must have access to a computer equipped with a web camera, microphone, and Internet access. Resources are available to provide students with these essential tools.

Recording of Classes (via ZOOM): Class sessions may be recorded via both voice and video recording. By attending and remaining in this class, the student consents to being recorded. Recorded class sessions are for instructional use only and may not be shared with anyone who is not enrolled in the class.

Schedule (tentative): – see online for RealTime version

<table>
<thead>
<tr>
<th>Week</th>
<th>Tuesday,Date</th>
<th>Tuesday Lecture</th>
<th>Thursday Lecture</th>
<th>Laboratory</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>10-Jan</td>
<td>No class</td>
<td>Intro; History of Mol Ecol</td>
<td>No class</td>
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<td>2</td>
<td>17-Jan</td>
<td>History of Mol Ecol</td>
<td>HWE</td>
<td>Intro to R</td>
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<td>3</td>
<td>24-Jan</td>
<td>Genetic drift</td>
<td>Genetic drift</td>
<td>Genetic diversity</td>
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<td>4</td>
<td>31-Jan</td>
<td>Ne</td>
<td>F-statistics</td>
<td>Genetic drift</td>
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<td>5</td>
<td>7-Feb</td>
<td>F-statistics</td>
<td>Selection</td>
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<td>6</td>
<td>14-Feb</td>
<td>Selection</td>
<td>Phylogeny</td>
<td>Outlier tests</td>
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<td>21-Feb</td>
<td>Phylogeny</td>
<td>Units of Conservation &amp; Forensics and monitoring***</td>
<td>Phylogenies</td>
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<td>8</td>
<td>28-Feb</td>
<td>Discussion</td>
<td>Conservation breeding***</td>
<td>Structure</td>
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<tr>
<td>9</td>
<td>7-Mar</td>
<td>Spring Break</td>
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<td>10</td>
<td>14-Mar</td>
<td>Discussion</td>
<td>Dispersal***</td>
<td>Assignment</td>
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<td>11</td>
<td>21-Mar</td>
<td>Discussion</td>
<td>Exploited populations***</td>
<td>SNPs</td>
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<td>12</td>
<td>28-Mar</td>
<td>Discussion</td>
<td>Invasive species ***</td>
<td>FINAL PROJECT</td>
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<tr>
<td>13</td>
<td>4-Apr</td>
<td>Discussion</td>
<td>Marine diseases***</td>
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<tr>
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<td>11-Apr</td>
<td>Discussion</td>
<td>Ancient DNA***</td>
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<td>18-Apr</td>
<td>Discussion</td>
<td>TBD</td>
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<td>25-Apr</td>
<td>Discussion</td>
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