



## **Course Information**

**Tropical Field Research**

**BIOL 4003**

Spring 2026

Part of the semester abroad at the Quetzal Education & Research Station in Costa Rica



## **Instructor Information**

Instructors: Dr. Caio França, Dr. Garner, Prof. Winslow, Prof. Gering

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Office Hours: via zoom - email prof. to request.

Field Coordinator: Marly Askren

Intern: Zachary Woods

## **Course Description**

This course is designed to provide students with tropical field research experiences through active participation in an ongoing scientific research project. Currently, the research projects

being developed at QERC are: 1) Neotropical Predators, 2) Tropical Cloud Forest Ecology, 3) Rio Savegre's Water Quality and Macro-Invertebrate Community, 4) Quetzal's Habitat and Population structure, 5) Beetle Community Composition Along Elevations in Tropical Cloud Forest, 6) Sustainability & Computing, 7) Mosquito Community in Tropical Montane Cloud Forest. Each semester 2-3 projects will be selected for students to participate. Selected projects will be on a rotation from year to year.

Students are NOT expected to develop a project, rather to contribute to the overall project as follows: **i)** reading available background information (e.g. primary literature) related to the project(s) and write a one-pager abstract of the topic; **ii)** under the guidance of a QERC faculty/intern, students will become familiar with the required protocols and methods to properly collect the data; **iii)** Data collection will be reported and annotated according to the specificities of each project and its respective data repository made available via canvas; **iv)** students will then write a two-page paper (details under Course Policies and Guidelines).

This course will begin with a **BASIC STATISTIC MODULE** to equip students to select the appropriate descriptive analysis test for the respective project. The data collection of the projects will take place on designated weeks, and they will take place on separate weeks. In this manner, at a given week all students will be actively involved in that given project allowing them to fully participate in all the projects.

The research process is an integral experience in teaching science students how to implement the scientific method in order to answer a specific research question. By practicing the scientific method, students will gain an understanding of the research process and then present their findings to the local community, fellow students back on campus and hopefully additional venues.

## Learning Outcomes

Upon successful completion of the course, students will be able to:

- students should be able to apply basic statistical techniques to analyze environmental data and interpret results.
- Prepare a literature review of background information relating to the research topic.
- Carry out original research, applying concepts of data collection, hypothesis testing, data presentation and interpretation.
- Generate new knowledge that will become a resource for future students and researchers at QERC.
- Prepare a short manuscript reporting results of original research.

- Work productively as part of a collaborative research team and as an independent researcher; maintain a positive social environment within the group when living and working in the field.
- Present results of original research in both an oral and written professional format.
- Understand the peer-review system for grants and publication of scholarly work.

## Course Materials

### Text:

- McMillan, V.E. 2006. *Writing Papers in the Biological Sciences*. Bedford/St. Martin's Publishing. (copies available at QERC)
- Kricher, J.C. 2011. *Tropical Ecology*. Princeton University Press, 978069111513. (copies available at QERC)
- Becker, C. 2023. *Insolvent: How to Reorient Computing for Just Sustainability*. MIT Press, 978-0262545600. [Freely available online via MIT Open Access](#).

**Protocols and Methods:** These will be available on the canvas page.

### Computer Disclaimer

It is the student's sole responsibility to ensure his or her computer meets compatibility requirements. Some hardware and or software firewalls may interfere with curriculum requiring them to be disabled during class time.

## Communication Options

1. SNU Email – Students use their institution-provided email account to communicate with the instructor regarding confidential matters, such as grades or attendance. Replies will not be sent to students' personal email accounts. Please, include the course title in the message subject line.
2. Meeting – Students may meet with the instructor/tutors virtually (or in person during their QERC visits). Virtual meetings are available during the office hours listed above or may be otherwise arranged upon request.
3. Phone – Listed in Instructor Contact Information above.

### Anticipated Instructor Response Time

I'll attempt to respond to emails quickly, however expect emails to be answered within 36 hrs during weekdays. From 6pm Friday until 8am Monday I will not respond to emails. Email sabbath runs from 6 pm Friday until 6 pm Sunday and is a time when the entire SNU campus is encouraged to refrain from emails. Therefore, do not expect an email reply from me during that time frame.

**Voicemail is NOT checked regularly.** If you call the office and I do not answer, the best thing to do is send an email. Response time for phone messages can be days if not weeks, so email is the best option.

## **Grade Determination**

### **Basic Statistics Module (10%)**

A self-paced online module on Canvas to introduce students to basic statistical concepts. The Module will contain instructional videos for self-paced study combined with synchronous lectures with your instructor, and in-class assignments that will run from Jan 17 - Feb 3.

By the end of the module students will be able to apply basic statistical techniques to analyze environmental data and interpret results.

### **Primary literature search and annotated bibliography (20%)**

Initial primary literature search will begin in January. Several papers will be provided in the "primary literature" for each respective project section on our Canvas webpage and students will each identify additional papers to meet the minimum requirement of 10 peer-reviewed papers. These can include previous work done at QERC, review articles and books, and primary research articles. Each student will complete an annotated bibliography (a numbered list including bibliographic citation and notes), which will summarize and indicate why each source is relevant to the research project. Please note that this is an initial search; it may be necessary to cite more articles in the final report. See McMillan chapter 1 for additional information about locating and using primary literature.

### **Field/Laboratory notebook (10%)**

- It is critical that you enter all procedures and data directly into your notebook in a timely manner, that is, while you are conducting the actual work.
- Field/Lab notebooks should be individual work, legible and organized. It should be written so that other people can follow your work exactly to achieve the same result(s).
- For each experiment/observation/data collection the following format should be followed:
  - Title and Date: Provide a descriptive title of day's work; date the work.

- o Purpose: Briefly describe the purpose or objectives of the experiment. (Min.: 2-3 sentences). You may also explain the significance of the procedure or the type of application that can be used with the procedure.
  - o Materials: Specific information on materials used.
  - o Methods: A step by step outline of the procedure(s) followed in gathering of your data.
  - o Results: Your results should be labeled and have enough information so that an outside reader can understand your results. The results should also be referenced appropriately (Fig. 1, or Table 1,) so you can discuss the results in the discussion section.
  - o Discussion: Summarize your result(s). Explain the outcome of the procedure. Were there unexpected results? Was there anything you could have done to better your result(s).
- If you make a mistake, put a line through the mistake and write the new information next to it rather than erasing an entry.
  - Continuation pages: Proper use of continuation notes makes it possible to follow your path through a long experiment or series of experiments without having to leaf through every page of your notebook. When you resume work on a previous experiment, enter the date, write Continued from page \_\_\_\_, and enter your results. This way, everything you do in your research is recorded chronologically.
  - Repeated procedures: So far you have been advised to record each step you perform in your research, regardless of whether the procedure is published somewhere. However, once you carry out a procedure, you can refer to that part of your notebook, and only note changes you make. For example, the first time you should write down the exact protocol followed in data gathering. The next time you follow the same protocol, just refer to the name of the procedure and the appropriate page(s) of your notebook where it is written in detail.
  - Table of Contents: Record all entries in the table of contents as you go along. You can organize it anyway you like but it is advisable to include multiple levels in a table of contents. That is, indicate where a new study starts and include subheadings for specific parts of a study, methods, sets of data, etc. The idea is to enable someone (such as a research partner, supervisor, or yourself a year from now) to find anything quickly. List each set of entries with dates and page numbers.
  - Loose materials: You might have paper data sheets, graphs in a spreadsheet, or pressed plants or photos that you wish to refer to. Some investigators prefer to attach such materials to the notebook itself, but too many such items make a sloppy notebook and can stress the binding. Loose data can be kept in a separate folder or

notebook, with location noted in the laboratory notebook. If the data is in a computer file, you should note the specific file name and file path at which it can be found and make sure you share it with your research partner and mentor.

- The intern and station manager will be checking the lab notebooks periodically to make sure that you are following protocol. Professors may also evaluate your notebooks when they are there. It will be necessary to transfer raw data from notebooks to electronic spreadsheets for visualization and analysis (in some cases, paper datasheets will be provided). Once your research is complete, your notebooks and electronic data files will be archived at QERC.

### **Final report (30%)** [*due Apr 26 by 5pm to Dr. França*]

Students will be assigned 3 projects during the semester, which consists basically of participating in data collection and annotation. The goal is to contribute to an ongoing research project that is taking place at or near QERC. All students will be required to be fully involved and complete all the activities for all the projects (except for the Final Report described below).

The format for the final report is as follows: Write an **extended abstract** (minimal of two-pages long) containing three sections: 1. an introduction of the topic, with background including relevance of study (why do we care?) and preliminary data available (what do we already know?), the present the research question (what we don't know?) and concluding with what this study is proposing (its goal or hypothesis) and how it will address the knowledge gap; 2. describe material and methods used; 3 report the data collected (include appropriate Figures properly labeled).

### **Public presentation (30%)**

A 10-minute oral presentation will be given to the class and instructors. This will be a power point presentation that explains your research and its relevance. A longer version will also be presented at SNU (or your home institution) during the fall semester as part of the weekly seminar series of the SNU Science Division (for SNU students only). You may also have the opportunity to participate in the OAS Fall meeting, the Beta Beta Beta spring conference or another scientific meeting. The final presentation should have the sections: introduction, methods, results and discussion/conclusion.

You will receive one letter grade for the course based on the following scale:

93.0 - 100% = A

83.0 - 86.9 = B

70.0 - 76.9 = C

90.0 - 92.9 = A-

80.0 - 82.9 = B-

60.0 - 69.9 = D

87.0 - 89.9 = B+

77.0 - 79.9 = C+

< 60.0 = F

## Course Policies and Guidelines

**Writing Standards:** It is reasonable to expect that any course may contain a writing component as part of the evaluation of student progress. I expect students to produce written work that is focused, well developed, organized and relatively free of grammatical, punctuation and spelling errors. Papers that fall short of this standard will not be accepted; the work will be returned to the students for revision within a reasonable time.

### Late Work Policy:

Late work will have a 50% deduction of the total points. Turning in assignments in advance is allowed.

Students will NOT be allowed to take make-up assignments/exams unless under extreme circumstances described below. Acceptable exceptions are limited to official SNU trips (provided advance notice is given to the professor) and medical emergencies with provided documentation (i.e. death of immediate family members, illness resulting in hospitalization, etc.). Failure to take an assignment/exam will result in a ZERO for that exam.

It is the student's responsibility to contact the professor:

- if a due date is unknown.
- if they are unsure about what the assignment requires.

Please be proactive and anticipate possible issues. Usually, waiting until the last minute to attempt an assignment does not allow time for problem solving. If unexpected events, such as computer problems, poor internet connection, sudden illness, questions about the assignment, etc. happen, deadlines will not be extended and may cause you to incur a late work penalty if not submitted by the due date. If computer issues arise, you may check out laptops from the SNU library.

## Academic Integrity

Southern Nazarene University seeks to support and promote qualities of academic honesty and personal integrity. Serious offenses against the University community include cheating,

plagiarism, and all forms of academic dishonesty. Any student who knowingly assists another student in dishonest behavior is equally responsible.

- Cheating or academic dishonesty is defined as the deception of others about one's own work or about the work of another. Examples of cheating include, but are not limited to:
  - Submitting another's work as one's own or allowing another to submit one's work as though it were his or hers.
  - Failure to properly acknowledge authorities quoted, cited, or consulted in the preparation of written work (plagiarism).
  - The use of a textbook or notes during an examination without permission of the instructor.
  - The receiving or giving of unauthorized help on assignments.
  - Tampering with or destroying the work of others.
  - Submitting substantial portions of the same academic work for credit or honors more than once without permission of the present instructor.
  - Lying about these or other academic matters.
  - Falsifying college records, forms, or other documents.
  - Unauthorized access of computer systems or files.

If an instance of academic dishonesty arises, the student(s) in question will be required to meet with me to discuss the situation, gravity of the offense, and consequences. At a minimum, any student(s) participating in academic dishonesty will receive a zero for the assignment(s) in question and the incident will be reported to the Office of Academic Affairs. A second instance of academic misconduct in the same course may result in a zero in the course. Depending on the severity of the infraction, the consequences of academic dishonesty may include failure of the course and/or expulsion from the university.

All instances of academic dishonesty will be reported to the Office of Academic Affairs to protect the integrity of all academic work done at SNU and to ensure that all students are treated with respect and justice from all involved in dealing with the instance.

The definition of cheating or academic dishonesty is detailed in the current [SNU Student Handbook](#).

Additionally, the University makes available computer facilities primarily for the use of students, faculty, and staff for purposes of research and instruction. Because electronic information is volatile and easily reproduced, respect for the work and personal expression of others is especially critical in computer environments. Violations of authorial integrity, including plagiarism and copyright violations, may be grounds for sanctions against members

of the academic community.

Principles and guidelines related to the ethical and responsible use of computers are also detailed in the current [SNU Student Handbook](#).

### **TEACH Act of 2002**

According to the TEACH Act of 2002, copyright protected materials may be provided as instructional content in the online classroom (Canvas) for the limited duration of the course. Students must not share, duplicate, transmit, or store any instructional material beyond the purpose and time frame of this course and/or the educational purpose of Southern Nazarene University. Failing to observe copyright protection is a violation of law.

### **Student Statement of Academic Integrity**

Students must formally agree to the following statement before beginning this course.

1. I affirm that all work submitted by me, including but not limited to assignments and assessments that I will submit in this course,
  - a. will be written by me
  - b. will include proper citation of any sources used
  - c. will not violate U.S. or international copyright laws
  - d. will comply with SNU Computer Use & Ethics policies
  - e. will comply with SNU Academic Integrity policies
2. I further affirm that violations of this policy may result in my dismissal from Southern Nazarene University, and may, at the institution's discretion, result in appropriate legal action being taken against me.

### **Online Learning Environment**

The official online learning environment of Southern Nazarene University is [Canvas](#) and it is greatly utilized in this course. Assignments, notifications, and grades will be posted in Canvas. Students should be able to navigate their way around Canvas in order to find learning activities, assessments, communication tools, and grades. Students who are new to the online learning environment visit [here](#) for help. Also, students should contact their instructor, ask fellow students, or contact the IT department with any questions early in the term, well in advance of critical due dates.

If assignment files are submitted electronically in the online learning environment, students should keep a backup of all files submitted.

## **The Use of Artificial Intelligence (AI) in Coursework**

While the SNU academic community embraces the exploration of emerging technologies like artificial intelligence (AI), we value the integrity of the learning process and the discerning use of technologies to advance, not detract, from learning gains.

The use of AI text generation tools within versions of ChatGPT, Grammarly, and others is not allowed unless expressly permitted by the course instructor.

The use of paraphrasing tools such as Quillbot, Spinbot, and others to paraphrase or copy information from sources without proper acknowledgment of sources is not allowed unless expressly permitted by the course instructor.

## **SNU Mission Statement**

The mission of the University is to make Christlike disciples through higher education in a Christ-centered community. This is accomplished within the context of the liberal arts, selected professional and graduate studies, a Wesleyan-holiness theological perspective, and a cross-cultural community life. The University is the Church at work in higher education, integrating faith, learning, and life.

## **Inclusivity and Respect**

Southern Nazarene University values each person created in the image of God, therefore, we also desire to be a community that reflects representation of diversity. We care about inclusion and equity through the refining of our character, the way we create culture and the way we serve Christ. Our university values reconciliation through God's love. In light of this commitment, we endeavor to foster a supportive environment of dignity and inclusivity in which all stakeholders, regardless of their perspectives and individual differences, are treated with respect and engage in charitable discourse.

## **Disability Statement**

The mission of Disability Services is to provide and coordinate support services that enable students with disabilities to receive equal access to all aspects of university life. Students needing assistance with a learning, physical or psychological disability that may affect his or her academic progress are encouraged to contact Disability Services. Students with temporary injuries (such as a broken limb, concussion, or surgery recovery) can receive

services and accommodations through Disability Services on a temporary basis. Location and contact information can be found on the Disability Services Disability Services website.

## **Institutional Resources**

Southern Nazarene University provides resources for students in on-ground and online courses. Though not an exhaustive list of resources, the following are the most often utilized resources for teaching and learning.

### **SNU Library**

The SNU Library provides both on-campus and online resources for researching, obtaining assistance from a librarian, interlibrary loan, subject-specific LibGuides, tutorials, and more. Online services, library location, hours, and contact information can be found on the [SNU Library website](#).

### **Disability Services**

Students needing assistance with a learning, physical or psychological disability that may affect his or her academic progress are encouraged to contact Disability Services. Location and contact information can be found on the [Disability Services website](#).

### **IT Helpdesk**

Information Technology provides a wide variety of computer and network services to SNU students and staff. Students may contact the [IT Helpdesk](#) for assistance with their laptop, login issues, and more.

### **SNU Portal**

The [SNU Portal](#) is an online service that provides a one-stop shop for doing business with the institution, accessing policies, and finding campus resources. Due to the confidential nature of many services in the portal, students and staff must log in with their SNU username and password.

## **Institutional Guidelines and Services**

Students and faculty of Southern Nazarene University should be familiar with the SNU Institutional Guidelines and Services not listed in this syllabus.

Although all the effort will be made to follow the current syllabus, changes might be needed at the discretion of the instructor. The syllabus link available on Canvas will always give access to the most updated information.