



SANT'ANNA
INSTITUTE
SORRENTO

COURSE NUMBER AND TITLE: BIOL 125 - Ecology of Man (4 credits)

This syllabus is informational in nature and is not an express or implied contract. It is subject to change due to unforeseen circumstances, as a result of any circumstance outside the University's control, or as other needs arise. If, in the University's sole discretion, public health conditions or any other matter affecting the health, safety, upkeep, or well-being of our campus community or operations requires the University to move to remote teaching, alternative assignments may be provided so that the learning objectives for the course, as determined by the faculty and the University, can still be met. The University does not guarantee specific in-person, on-campus classes, activities, opportunities, or services or any other particular format, timing, or location of education, classes, activities, or services.

Mask Policy

Please be advised that the mask policy in this class will follow Sant'Anna Institute requirements. When/if the University enacts a mask policy, all students are expected to adhere to the policy.

COURSE DESCRIPTION

This course is an overview of the primary ecological concepts and how these apply to the problems facing the human species. The focus will be mainly on wildlife and terrestrial ecosystems. Population, pollution, energy and man's effect on other species will be discussed. The course explores topics such as population dynamics, pollution, energy consumption, and the impact of human activities on ecosystems and biodiversity. Emphasizing real-world applications, the course includes field trips, laboratory activities, and data analysis to develop a comprehensive understanding of ecology and its role in addressing contemporary environmental challenges. Students will be encouraged to actively engage with the material, critically assess scientific literature, and conduct research projects that reflect their learning, while using tools designed and routinely used by researchers in different ecological fields.

COURSE OBJECTIVES

- i. Introduce students to fundamental ecological concepts and their application to human environmental issues.
- ii. Analyze the interactions between humans and ecosystems, with a focus on anthropogenic pressures such as pollution, resource consumption, and climate change.

- iii. Provide students with practical skills in ecological data collection, statistical analysis, and the use of software tools like R and QGIS.
- iv. Foster critical thinking through the discussion of scientific literature and the exploration of case studies in ecology.
- v. Develop students' ability to communicate ecological knowledge effectively through presentations, research projects, and group work.

LEARNING OUTCOMES

By the end of the course, students will be able to:

- i. Explain key ecological concepts such as energy flow, nutrient cycling, population dynamics, and biodiversity.
- ii. Be knowledgeable about classification of terrestrial organisms, and the structure and scale of habitats, ecosystems, biomes.
- iii. Investigate the effects of human activities on ecosystems, including pollution, habitat destruction, and climate change.
- iv. Apply basic quantitative techniques, including sampling and statistical analysis, to ecological data.
- v. Be knowledgeable regarding the existence and use of software tools such as R and QGIS to analyze and visualize ecological data.
- vi. Synthesize ecological knowledge and communicate findings through research projects, presentations, and scientific discussions.

FORMAT

Lectures will be integrated with student presentations, microscopic labs, computer labs, field trips, and discussions on scientific literature leading to the development of a small research project. Students will be expected to actively participate in class.

REQUIRED TEXTS (for independent consultation and class discussion)

Selection of primary literature (various specific topics throughout the course)

- Begon, M., Townsend, C. R., & Harper, J. L. (2006). *Ecology: From individuals to ecosystems* (4th ed.). Blackwell Publishing.
- Dunlop, J. A., & Parsons, S. (Eds.). (2019). *100 influential papers in ecology*. Oxford University Press.
- Fisher, M. R., Smyth, R., Han, K., & Baldrige, R. (2019). *Environmental biology*. OpenStax. <https://open.umn.edu/opentextbooks/textbooks/environmental-biology>
- QGIS User Manual. https://docs.qgis.org/3.40/en/docs/user_manual/index.html
- McGinley, M. A., & Fowler, J. (2017). *Choosing and using statistics: A biologist's guide* (3rd ed.). Wiley-Blackwell.
- Wilcox, R. R. (2012). *Statistics using R with biological examples*. Wiley.

Digital access and/or copies will be provided at no cost to students.

EXAMS and ASSIGNMENTS

20%: Mid Term Evaluation

20%: Presentations (2 in total)

30%: Attendance and Participation

30%: Final Project (abstract + power point presentation)

GRADING SCALE

A	95%-100%
A-	90%-94%
B+	87%-89%
B	83%-86%
B-	80%-82%
C+	77%-79%
C	73%-76%
C-	70%-72%
D+	67%-69%
D	63%-66%
D-	60%-62%
F	< 60%

SCHEDULE OF THE TOPICS

Module 1: Foundational Theories in Ecology (Week 1-2)

This module introduces foundational ecological concepts, beginning with an exploration of the Earth's ecosystems and how they function. It covers the principles of energy flow, nutrient cycling, and the interrelationships between organisms and their environments. Key ecological processes such as succession, competition, and predation are introduced to provide a solid understanding of how ecosystems are structured and maintained.

- A. Introduction to Ecology: Definitions and Scope
- B. Principles of Ecosystem Structure and Function
- C. Population Ecology: Growth Models and Carrying Capacity
- D. Biodiversity and Evolutionary Perspectives in Ecology

- E. Journal club: Group discussion on a previously selected scientific paper and its version for the general public – reflection of different styles of communication

Laboratories

- 1st Field Trip (3h outdoor): Observing Ecosystem Components

Module 2: Interaction of Organisms – From Cells to Ecosystems (Week 3-5)

This module explores the interactions between organisms at various ecological levels, from individual cells to entire ecosystems. It begins with an examination of trophic levels, food webs, and ecological pyramids, highlighting how energy flows through ecosystems. The module then delves into community ecology, focusing on species interactions such as competition, predation, and mutualism, as well as the concept of ecological succession. It also covers biomes and global ecosystem patterns, illustrating the diversity of life across different environmental regions. A case study on ecosystem resilience and stability is included to explore how ecosystems respond to disturbances and maintain balance over time.

- A. Life in terrestrial ecosystems
- B. Terrestrial organisms' classification (spatial, taxonomic and trophic)
- C. Trophic Levels, Food Webs, and Ecological Pyramids
- D. Community Ecology: Species Interactions and Succession
- E. Biomes and Global Ecosystem Patterns
- F. The many facets of ecological fields

Laboratories

- Laboratory activity (3h indoor): Case Study – Observing ecological adaptations in plants and invertebrates (using magnifying glasses, stereomicroscopes, and sample processing techniques)

Module 3: Anthropogenic Pressures and Their Ecological Impacts (Week 6-8)

This module examines the significant ecological impacts caused by human activities. It begins with a discussion on human population growth and resource consumption, exploring how these factors drive environmental change. The module then briefly addresses the various forms of pollution—air, water, and soil contamination—and their effects on ecosystems. Climate change is also covered, focusing on its role in driving global ecological shifts and altering habitat conditions. Finally, the module looks at habitat destruction and species extinctions, highlighting the consequences of human development and land use on biodiversity. Through these topics, students gain insight into the magnitude of anthropogenic pressures and the urgent need for sustainable solutions.

- A. Human Population Growth and Resource Consumption

- B. Pollution: Air, Water, and Soil Contamination
- C. Climate Change and Global Ecological Shifts
- D. Habitat Destruction, Fragmentation, and Species Extinctions
- E. Land use shifts and the Creation of New Habitats
- F. Conservation Science: Ecological Mitigation, Restoration, Rewilding, Reintroductions
- G. 1st Group Presentation: “A case study on ecosystem resilience and stability to explore how ecosystems respond to disturbances and maintain balance over time.”

Laboratories

- 2nd Field Trip (3h outdoor): Assessing Human Impact on Local Ecosystems

Mid-term Evaluation (Week 8)

Module 4: Ecological Applications in Human Activities and Ecosystem Services (Week 9-12)

This module explores the application of ecological principles to human-driven systems. It begins with agroecology, examining sustainable agriculture and food systems that aim to balance ecological health with food production. The module then covers ecoepidemiology, focusing on the intersection of ecology, disease, and human health, highlighting how environmental changes affect disease dynamics. Next, urban ecology is explored, with a focus on green infrastructure and biodiversity in cities, addressing how urban environments can be designed to support ecological functions. The module also introduces the concept of ecosystem services, emphasizing the vital benefits that natural ecosystems provide to human societies, such as clean water, air, and pollination, and how these services can be integrated into sustainable development strategies (mention to Sustainable Development Goals, SDGs).

- A. Urban Ecology: Green Infrastructure and Biodiversity in Cities
- B. Agroecology: Sustainable Agriculture and Food Systems
- C. Ecoepidemiology: Disease Ecology and Human Health
- D. One Health
- E. Ecosystem Services: Vital Benefits of Natural Ecosystems
- F. Integration of Ecosystem Services into Sustainable Development Strategies
- G. Journal club: Group discussion on a previously selected scientific paper and its simplified version for the general public – how to select trustworthy sources of scientific information
- H. 2nd Group Presentation: “Qualitative results of the urban ecology street activity, reflection on mitigation measures”

Laboratories

- Urban Ecology street activity in groups (6h outdoor): Delivering interviews and questionnaires about a selected topic of urban ecology (green spaces, sound pollution, effect of pets predation on wildlife, urban biodiversity)

Module 5: Data Analysis – Techniques and Software (Week 13-15)

This module introduces the essential methods and tools used in ecological data analysis. It begins with an overview of ecological data collection methods, focusing on how to gather and interpret field data accurately. The module then briefly explores quantitative techniques, including sampling methods, statistical analysis, and ecological modeling, to help students understand patterns and relationships in ecological systems. Finally, the module covers key open-source software tools, such as R, QGIS, and others, providing students with practical skills to analyze and visualize ecological data effectively. These tools and techniques are essential for making informed decisions and solving real-world ecological problems.

- A. Introduction to Ecological Data Collection Methods
- B. Quantitative Techniques: Sampling, Statistics, and Modeling
- C. Software Toolkit: R, QGIS, and Other Useful software
- D. Open Science: rigor, accountability, and reproducibility (inclusion, fairness, equity, and sharing)
- E. Final Project presentation: Applying Quantitative Methods to a Real-World Issue (production of an abstract and a power point presentation with relevant references, choice of presenting style: scientific conference, stakeholder engagement event, or public awareness event)

Laboratories

- Hands-on Computer Workshop (5h in two separate sessions): Analyzing Ecological Data

CLASS POLICY

Attendance

You are allowed **ONE** unexcused absence. Documentation for any other absence **MUST** be produced and **APPROVED** by your faculty. For absences due to illness, please provide the faculty with a doctor's note upon returning to class as well as inform them and/or the Office the first day of illness.

Participation grants the student one point for each lesson they attend. Unjustified absences result in 0 points. Participation in **field-trips**, if any, awards 2 points, while non-participation results in a loss of 2 points.

Late submissions:

Assignments not submitted by the due date will receive a penalty of 10% for the first 24 hours, 20% for a 48-hour delay. No submissions will be accepted more than 3 days after the deadline, unless arrangements have been made with the instructor (for extensions under exceptional circumstances, apply to the course instructor).

Personal Technology:

Please turn cell phones off during class. You can use laptops to take notes, however social networking, e-mailing, surfing the Internet, playing games, etc. are forbidden during class. Any student caught using their laptop/cell phones inappropriately during class will be asked to turn them off. Repeated violations of this rule after the first warning will result in the student being marked absent for the day and permanently losing their laptop privileges. Please be respectful and limit your use of personal electronic devices during class to academic purposes.

Contesting a grade:

If students wish to contest a grade, they must make an appointment to do so in person. The student should contact the instructor with any concerns within ONE week of receiving the grade. The student must also demonstrate that they have read the comments accompanying the grade by presenting a brief written statement specifying why the grade does not reflect the quality of the work. It is at the discretion of the instructor to decide whether the work and the student's request warrant any increase or decrease in the grade. Students should retain a copy of all submitted assignments and feedback (in case of loss) and should also retain all of their marked assignments.

Recommended behavior:

- Class begins promptly at the beginning of the class period. It is advisable that you be in your seat and ready to start participating in class at that time.
- Always bring the required supplies and be ready to be actively engaged in the learning process. This communicates preparedness and interest.
- Turn your cell phone off or to vibrate mode before the start of class;
- It is fine to bring a drink or a snack to class, as long as it is not distracting. In conjunction with this, please pick up your trash when you leave the room.
- Your professor expects your full attention for the entire class period. If you know that you'll need to leave before the class is over, try to sit as close to the door as possible so as not to disrupt others. Similarly, if you arrive in class late, just slip in as quietly as possible and take the first available seat you come to.
- Do not sleep in class! Laying your head on the desk or sleeping in class is rude, and it is distracting to others. Turn in assignments on time.
- When you have a question or comment, please raise your hand first as a courtesy to your classmates and the professor. Remember, your questions are NOT an imposition – they are welcome. So, ask questions! You'll learn more, it makes the class more interesting, and you are helping others learn as well.

- If an emergency arises that requires an absence from a session, it is your responsibility to get the notes and all other information that was covered in class from a colleague you trust.

Secular and religious holidays:

Sant'Anna Institute recognizes that there are several secular and religious holidays - not included in the Italian calendar - that affect large numbers of its community members. In consideration of their significance for many students, no examinations may be given and no assigned work may be required on these days. Students who observe these holidays will be given an opportunity to make up missed work in both laboratories and lecture courses. If an examination is given on the first class day after one of these holidays, it must not cover material introduced in class on that holiday. Students who wish to observe such holidays must inform their instructors within the first two weeks of each semester of their intent to observe the holiday even when the exact date of the holiday will not be known until later so that alternative arrangements convenient to both students and faculty can be made at the earliest opportunity.

Students who make such arrangements will not be required to attend classes or take examinations on the designated days, and faculty must provide reasonable opportunities for such students to make up missed work and examinations. For this reason it is desirable that faculty inform students of all examination dates at the start of each semester.

ACADEMIC HONESTY

“Members of the Jacksonville University community are expected to foster and uphold the highest standards of honesty and integrity, which are foundations for the intellectual endeavors we engage in.

To underscore the importance of truth, honesty, and accountability, students and instructors should adhere to the following standard:

“On my honor as a student of Jacksonville University, I promise to uphold the values of honesty, trust, fairness, respect, and responsibility in all my dealings with faculty, staff, and students.”

Academic misconduct occurs when a student engages in an action that is deceitful, fraudulent, or dishonest regarding any type of academic assignment that is intended to or results in an unfair academic advantage. In this context, the term “assignment” refers to any type of graded or ungraded work that is submitted for evaluation for any course. Academic misconduct includes but is not limited to cheating, collusion, falsification, misrepresentation, unauthorized collaboration on assignments, copying another student’s work, using or providing unauthorized notes or materials, turning in work not produced by the individual, attempting to get credit for a single instance of work submitted for more than one course, and plagiarism. Furthermore, providing deceitful, fraudulent, or dishonest information during discussions of an academic matter with faculty are also examples of academic misconduct.” (Jacksonville University Academic Integrity [Policy](#)).

Throughout this course we will be reading and reporting about the work of others. All information that is not original to the student must be appropriately attributed in both presentations and written work. All students are expected to do their own work and give appropriate credit for all sources used in the process of preparing papers, presentations, and homework assignments. Group assignments will be graded based on the product of the work, although some adjustment may be made for participation. [If you have a question about whether or not collaboration is allowed, or how to cite a reference, please ask. It is always better to check than to be accused of an unintended violation of the academic honesty policy]. Violations of the academic honesty policy will be dealt with in accordance with university policies [Refer to current Academic Catalog "Academic Integrity and Misconduct"].

Course Level Penalties: A first offense may result in a failing grade for the assignment. Second offenses may result in failure in the course. Significantly egregious violations may result in expulsion from the university. When in doubt give credit for all information that did not come directly out of your head!

DISABILITY STATEMENT

Students with a documented disability requesting classroom accommodations or modifications, either permanent or temporary, resulting from the disability are encouraged to inform the faculty in the first week of the program.