



## **ES 310 - CHANGE OF ECOSYSTEMS AS A RESULT OF LONG-TERM HUMAN ACTIVITIES IN SOUTHWEST GERMANY AND THE SWISS ALPS**

IES Abroad Freiburg

### **DESCRIPTION:**

Students will be introduced to the natural history, cultural history, ecology, and management of different ecosystems in southwest Germany and the Swiss Alps. This course will teach that current ecosystems are a result of the interaction between natural and anthropogenic factors on various scales in time and space. In some examples of ecosystems students will learn to recognize and analyze the benefits and problems created by long-term human activities. This course includes several one-day excursions, field trainings and a two-day field study trip to the Swiss Alps.

**CREDITS:** 3 credits

**CONTACT HOURS:** 45

**LANGUAGE OF INSTRUCTION:** English

**PREREQUISITES:** Basic knowledge of ecology / natural resource management

**ADDITIONAL COST:** None

### **METHOD OF PRESENTATION:**

The course will be a combination of lectures, contributions of students (presentations), discussions, and several field study trips.

### **REQUIRED WORK AND FORM OF ASSESSMENT:**

- Course participation – 20 %
- Short Group Presentations – 20 %
- Field Trip Reports – 30 %
- Final Exam – 30 %

#### **Course Participation – 20 %**

Students are expected to participate in debates with questions related to the readings and Students are required to complete all reading assignments and will be expected to demonstrate this through regularly assigned homework, pop quizzes, and/or insightful and relevant contributions to in-class discussion. All these components will count toward the class participation grade. Participation also applies to course-related trips, outings and/or special events in and around Freiburg. A rubric for participation is available in the appendix and on Moodle.

#### **Short Group Presentations – 20 %**

You will be assigned to one presentation (depending on enrollment, 1-3 students per presentation) with assigned literature. Each student/group is allowed approx. 10-15 minutes to present the topic and 5-10 additional minutes to facilitate a discussion with the class. The presentation must be uploaded on Moodle by midnight on the evening before it will be held.

The presentations will focus on the basics of and aim for a mutual understanding of each assigned topic. The discussions aim to provide a deeper understanding of the topic with examples.

#### **Final Exam – 30 %**

The final exam will be a comprehensive assessment of all topics. Students will have 90 minutes to complete the exam in class, which will consist of essay questions dealing with topics from the entire class. Detailed instructions on the content of the final exam will be distributed in advance

#### **Field Trip Reports – 30 %**



After each field trip, students are required to write two short (250-500 words) reflection papers that review what they have learned and critically relate it to the course content.

#### LEARNING OUTCOMES:

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

- understand current ecosystems as a result of anthropogenic and natural factors.
- analyze the structure and dynamics of ecosystems using discussed methods.
- assess ecological risks and opportunities under changing environmental conditions.
- understand regional concepts of nature protection and nature reserves and conflicts with tourism.
- communicate the gained knowledge in oral (short presentation, discussions) and written form (field report).

#### Attendance Policy (see also the detailed version on Moodle ESS Academics page)

IES Abroad courses are designed to utilize the unique contribution of the instructor; the lecture/discussion format is regarded as the **primary mode of instruction**. Therefore, attendance is mandatory. Any unexcused absence will incur a penalty on your final course grade. Deductions from grades due to absences are based on contact hours (= 45 minutes). Any unexcused absence will result in a penalty on your final course grade (1 unexcused contact hour absence - 1%, 2nd unexcused contact hour absence -2%, 3rd unexcused contact hour absence – 3% and so on). Any student who misses more than 25% of a course (= more than 11 contact hours), whether the absences are excused or are unexcused, will receive an “F” as the final grade in the course.

ESS courses may have entire course blocks that take place on one day in addition to longer field trips that count for several contact hours. In this case, the actual missed contact hours are added together, and the absences are sanctioned according to the rule above. If you are late for a planned field trip, you will generally not be able to join the trip, since the group needs to leave on time and cannot wait for one person. Punctuality is therefore essential here. If you miss a class, it is **your responsibility** to make up on everything that was covered in class. Tests/presentations missed during unexcused absences **cannot be made up**.

**Arriving late for class:** Punctuality is important for the planned course schedule. If you are late for class, the late time will be recorded and added up at the end of the course. You will receive a grade reduction based on the accumulated amount of missing contact hours (as outlined above; i.e., if you were late by 15 minutes on 3 days, your grade would be reduced by 1% for 1 missing contact hour).

**LATE OR FAILURE SUBMISSION OF ASSIGNMENTS:** Late submission of assignments or failure of submission of assignment results in the grade F of that particular assignment. This does not apply to late or non-submission due to illness with an excused absence.

**Excused absence:** Please call the IES Center before the start of your first class if you are ill and would like to be excused from your course, as outlined in the "Cell Phone and Attendance Policy" handed out during orientation. Student Affairs staff will decide whether your absence can be excused directly or whether a doctor's note is necessary. Absences due to religious observances and family emergencies may be excused at the discretion of the Center Director, with written approval. A petition for an excused absence due to a religious holiday needs to be submitted 2 weeks in advance. If permission is granted, the student needs to inform the Academic Dean, the Student Affairs Team and their instructors. Absences due to private travel or travel delays cannot be excused, even with advanced notice.

#### ACADEMIC INTEGRITY CODE:

Students are expected to abide by the IES Abroad Code of Academic Integrity. The detailed IES Abroad academic integrity code can be accessed on Moodle.

All work submitted by a student for academic credit should constitute the student's own original work. Regardless of the quality of work, plagiarism will result in a failing grade for the course and/or an academic review and possible expulsion from the program. Plagiarism may be broadly defined as “copying of materials from sources, without acknowledging having done so, claiming other’s ideas as one’s own without proper reference to them, buying materials such as essays/exams, and using AI-generated content without disclosure.”

As AI tools continue to evolve, learning how to use them responsibly is an important emerging skill. Some of our courses allow students to explore the use of generative artificial intelligence (GAI) tools such as ChatGPT for some assignments and assessments. The

instructor of each course will communicate whether GAI may be used in a course and provide specific guidelines and procedures for its appropriate use.

Updated information on your course and readings, including additional readings from journalistic articles, can be found on the Moodle platform at <https://moodle.iesabroad.org/login/index.php>

#### CONTENT:

|               | Content                                                                                                                                                                                                                                       | Assignments and Readings                                                                                                                                                            |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Week 1</b> |                                                                                                                                                                                                                                               |                                                                                                                                                                                     |
| <b>Day 1</b>  |                                                                                                                                                                                                                                               | <ul style="list-style-type: none"> <li>Ellenberg, <u>Vegetation ecology of Central Europe</u>, pp. 1-42.</li> </ul>                                                                 |
| <b>Day 2</b>  | <p><b>Welcome and introduction to course resources &amp; structure</b></p> <p><b>Lecture</b><br/>Introduction to the natural history and biogeography of southwest Germany<br/>Assignments of topics and readings for short presentations</p> | <ul style="list-style-type: none"> <li>Ellenberg, <u>Vegetation ecology of Central Europe</u>, Chapter B4.</li> <li>Spieker, <u>Silvicultural management</u>, pp. 55-65.</li> </ul> |
| <b>Day 3</b>  | <p><b>Lecture</b><br/>Introduction to the cultural and natural history and ecology of mountain-forest ecosystems in the Black Forest.</p>                                                                                                     |                                                                                                                                                                                     |
| <b>Day 4</b>  | <b>Field trip to strongly influenced and near to natural forests of the Black Forest.</b>                                                                                                                                                     | <ul style="list-style-type: none"> <li>Ellenberg, <u>Vegetation ecology of Central Europe</u>, Chapter D1, D9.</li> </ul>                                                           |
| <b>Day 5</b>  | <p><b>Lecture</b><br/>Introduction to the ecology (e.g. climate influence), land use and cultural history of semi-arid ecosystems in the Upper Rhine Valley</p> <p><b>Class discussion</b></p>                                                | <ul style="list-style-type: none"> <li>Wilmanns, <u>Können Trockenrasen derzeit trotz Immissionen überleben</u>, abstract.</li> </ul>                                               |
| <b>Week 2</b> |                                                                                                                                                                                                                                               |                                                                                                                                                                                     |

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| <b>Day 1</b>  | <b>Field trip through various semi-arid ecosystems (poor grasslands, vineyards and forests) in the Kaiserstuhl.</b>                                                                                                                                                                                    | <ul style="list-style-type: none"> <li>Schuhmacher and Bugmann, <u>Swiss Alps</u>, pp. 1435-1450.</li> <li>Ellenberg, <u>Vegetation ecology of Central Europe</u>, pp. 243-247, pp. 255-256.</li> </ul> |
| <b>Day 2</b>  | <p><b>Lecture</b><br/>Examples of ecosystems with human caused longterm changes. How can we identify ecosystem changes in the field?<br/>The role of soils in long term changes of ecosystems</p> <p><b>Field trip</b><br/>Practical identification of human caused ecosystem changes in Freiburg.</p> |                                                                                                                                                                                                         |
| <b>Day 3</b>  | <p><b>Lecture</b><br/>Biogeography of the Swiss Alps and change of ecosystems in the Rhone Valley.</p> <p><b>Student presentations</b></p>                                                                                                                                                             | <ul style="list-style-type: none"> <li>Temperli, <u>Vegetation dynamics</u>.</li> </ul>                                                                                                                 |
| <b>Day 4</b>  | <b>Student presentations</b>                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                         |
| <b>Week 3</b> |                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                         |
| <b>Day 1</b>  | <b>Field Trip to Swiss Alps</b>                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                         |
| <b>Day 2</b>  | <b>Field Trip to Swiss Alps</b>                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                         |
| <b>Day 3</b>  | <b>Field Trip to Swiss Alps</b>                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                         |
| <b>Day 4</b>  | <b>Self-Study Day</b>                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                         |
| <b>Day 5</b>  | <b>Final exam</b>                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                         |

#### COURSE-RELATED TRIPS:

- Black Forest
- Kaiserstuhl
- Freiburg
- Swiss Alps

#### REQUIRED READINGS:

- Ellenberg, H. Vegetation ecology of Central Europe. Cambridge Univ. Press, 4th ed., 2009.  
➤ Book is used as a whole; individual chapters are assigned to sessions (see session-list above)
- Glatzel, G. "The impact of historic land use and modern forestry on nutrient relations of Central European forest ecosystems," in Fertilizer Research, 27, 1991, pp. 1-8.
- Pro Silva (1999): "Brochure 'close to nature forest management'" in PRO SILVA. European federation of foresters advocating forest management based on natural processes, pp. 1-12. URL: <http://www.prosilvaeurope.org>
- Schuhmacher, S. and Bugmann, H. "The relative importance of climatic effects, wildfires and management for future forest landscape dynamics in the Swiss Alps," in Global Change Biology, 12/8, 2006, pp. 1435-1450.
- Schweingruber, F.H. Treerings and Environment Dendroecology, Verlag Paul Haupt, 1996.
  - Chapter 9: Growth factors, pp. 27-36.
  - Chapter 18: Influence of Man, pp. 344, pp. 414-420.
  - Chapter 19: Influence of Climate (Dendroclimatology), pp. 440, pp. 444-449.
- Spieker, H. "Silvicultural management in maintaining biodiversity and resistance of forests in Europe (temperate zone)," in Journal of Environmental Management, 67, 2003, pp. 55-65.
- Temperli, Christian. Vegetation dynamics after forest fire in comparison to the pre- fire state. Zürich: 2007. URL: <https://www.research-collection.ethz.ch/handle/20.500.11850/108535>

#### RECOMMENDED READINGS:

- Wilmanns, O. Können Trockenrasen derzeit trotz Immissionen überleben, english abstract.
- Anstett, M. and Bogenrieder A. „Dendrologische und ökologische Untersuchungen an Buxus sempervirens im Buchswald bei Grenzach“, in Naturforschende Gesellschaft Freiburg, 95/2, 2005, english abstract.

#### Appendix:

#### Rubric for course participation:

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
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| <b>A</b> | <b>Excellent participation</b><br>The student's contributions reflect an active reading of the assigned bibliography. Skillfully synthesizes the main ideas of the readings and raises questions about the applications and implications of the material. Demonstrates, through questions and comments, that they have been capable of relating the main ideas in the readings to the other information discussed in the course and with their own life experience. The student makes informed judgments about the readings and other ideas discussed in class, providing evidence and reasons. They respectfully state their reactions about other classmates' opinions and can contribute to the inquiry spiral with other questions. The student gets fully involved in the completion of the class activities. |
| <b>B</b> | <b>Very good participation</b><br>The student's contributions show that the assigned materials are usually read. Most of the time, the main ideas are identified, even though sometimes it seems that applications and implications of the information read were not properly reflected upon. The student can construct over others' contributions, but sometimes seems to interrupt the shared construction to go over tangents. They are respectful of others' ideas. Regularly involved in the activities but occasionally loses concentration or energy.                                                                                                                                                                                                                                                       |
| <b>C</b> | <b>Regular participation</b><br>The participant evidences a regular reading of the bibliography but in a superficial way. They try to construct over others' ideas, but commonly provide comments that indicate a lack of preparation about the material. Frequently, contributions are shallow or unarticulated with the discussion in hand.                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

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| F | <p><b>Insufficient participation</b></p> <p>Consistently, the participant reads in a shallow way or does not read at all. Does not participate in an informed way and shows lack of interest in constructing over others' ideas.</p> |
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