



TITLE: SUSTAINABLE DEVELOPMENT IN SPAIN - ENVIRONMENTAL CHALLENGES AND PATHWAYS

LANGUAGE: English

TOTAL HOURS: 45 hours

CREDITS: 3 credits

SIS Course Code: SUST 335

Will appear on a Jacksonville University transcript as: SUST 335 - Sustainability

DESCRIPTION

The course will analyse the key environmental challenges in Spain, with the goal of finding solutions towards a sustainable management of natural resources. The first part of the course will identify the defining elements of Mediterranean ecosystems, climate and landscape characteristics, as well as historical patterns of resource exploitation in the region. The second part of the course will highlight the key environmental challenges in Spain and explore sustainable management solutions. The third and final part will feature case studies where the students will be able to understand the shared threats among the different regions and the differences posed by the elements studied in the first part of the course, resulting in the complex nature of the problematic and the need for innovative solutions. Throughout each topic, the role of humans as key drivers of ecosystem changes will be studied, the main geographical limitations, and the current and potential efforts to reverse the ecological damage caused by these activities with a focus on sustainable development.

COURSE OBJECTIVES

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

- Identify the main characteristics of Mediterranean and Spanish Ecosystems, climate and landscape traits.
- Analyze the historical patterns of landscape exploitation in the region.
- Identify the main environmental problems faced by the country as a whole and devise long-term solutions towards sustainable management of Natural resources.
- Identify the regional differences and the need for case-sensitive solutions.
- Understand the shared problems and familiarise themselves with existing national and regional initiatives.
- Apply the knowledge learned in the course towards the creation of management solutions for specific country-wide environmental problems.

METHODOLOGY

The course objectives will be met through a combination of lectures, discussions, written assignments, exams and field trips to give students the opportunity to learn from a broad range of pedagogical elements. These elements are described below:

Lectures will provide the platform to introduce each topic, set core concepts and analyze the different elements involved in each session while promoting discussions to share different points of view and encourage student participation.

Readings: selected literature for each session will provide an overview of the relevant subject and background information, or a case study that illustrates the main ideas to be discussed during class. Readings consist mostly of academic publications (peer-reviewed articles).

Reading Assignments will be based on the reading for a particular session and aim to help the student identify the key information from the selected article(s) and facilitate discussion during class.

In-class activities are designed to apply the learned information and help the student assimilate it in a more personal way. These consist of group activities, analyses, presentations and documentary viewings among others. These activities also promote student participation.

Research project: Students will choose a topic related to the course material and explore it in more detail, proposing a long-term management approach for an identified regional problem. The written part will be followed by an oral presentation.

Field trips will provide a hands-on experience to some of the topics through visits to certain localities that exemplify some key topics presented in class. There will be **Four** field studies as part of this course, supporting several of the course subjects:

- Delta del Llobregat (Biodiversity, Ecosystems, coastline).
- Collserola Hike (Barcelona: limitations to growth, Ecosystems).
- Bogatell beach (Tourism, sustainable development).
- La Fàbrica del Sol- self-guided visit (Urban Sustainability, renewable energies).

EVALUATION

The final grade will be calculated as follows:

Class participation and Homeworks	15%
Field Trips	20%
Research Project	25%
Midterm exam	20%
Final exam	20%

Class Participation: Participation will be graded every class following a participation Rubric.

Exams: Exams will consist of a mix of multiple choice, short-answer and open-ended questions.

ACADEMIC INTEGRITY

SIS programs foster critical thinking and intellectual development of its students. In doing so, SIS requires that students introduce their original thoughts, opinions, and ideas in all of their



assignments with the support of cited sources. Any violations of academic integrity- such as cheating, plagiarism, self-plagiarism, academic misconduct, fabrication, misuse or misrepresentation of research, and noncompliance - may result in an automatic "F", or immediate dismissal from the program if the student falls below the minimum number of credits required for the term; 12 credits during the semester, or 3 hours during the summer.

Cheating: Any action that violates the rules and guidelines given by the instructor for submitting assignments or exams.

Plagiarism: Any action that presents the ideas, opinions, research, etc. of another as your own.

- Directly copying another's work without citing sources
- Submitting another person's work into your own without properly citing the source(s) used.
- Paraphrasing another person's work without providing appropriate citations

Self-Plagiarism: Submitting a piece of one's own work to receive credit for multiple assignments in one or more classes.

Academic Misconduct: Any act that impedes or threatens the open exchange, expression, or flow of information or fair evaluation of students. This includes intimidation and complicity in any acts or attempts to interfere with the ethical and fair submission and evaluation of student work.

Fabrication: Providing inaccurate or false information, including research findings, quotes, and cited sources, etc.

Non-Compliance: Failure to comply with the values, objectives, and procedures contained in this policy.

As SIS is accredited by Jacksonville University, students are held accountable to JU's [Academic Integrity and Code of Conduct](#). You are expected to read and understand the JU terms and regulations of Academic Misconduct.

<https://drive.google.com/file/d/1PyZmN0EAH1o4bKVZdZXVYKw-wdiwXewx/view>

ATTENDANCE POLICY

Semester: Students are allowed THREE absences throughout the semester without penalty. Starting with the fourth absence, the student's FINAL GRADE will be lowered by a fraction of a letter (1/3 of a letter grade). For example, if a student has 4 absences and a final grade of B+, the grade will be lowered to a B, if 5 absences the grade is lowered to B-.

Summer: Students are allowed TWO absences throughout the summer without penalty. Starting with the third absence, the student's FINAL GRADE will be lowered by a fraction of a letter (1/3 of a letter grade). For example, if a student has 4 absences and a final grade of B+, the grade will be lowered to a B, if 5 absences the grade is lowered to B-.

**January Term students are allowed TWO absences as well.*

There are NO excused absences. If a student misses class because s/he is sick, that counts as one of the allowed absences. No excused absences and no excuses.

Quizzes, exams and participation points that are missed because of an absence cannot be recuperated.

Students that arrive late 5 minutes or more will receive a 0 for participation for the day.

COURSE CONTENT

Session	Content	Readings
1	Course Introduction	
2	The Mediterranean climate and environmental History.	<p>Suc, J.P. (1984) Origin and Evolution of the Mediterranean vegetation and climate in Europe. <i>Nature</i> 307 (2), 429-432.</p> <p>Hughes, J.D. (2005). <i>The Mediterranean: An Environmental History</i>. Santa Barbara, California: ABC-CLIO, pp 1-22.</p>
3	The human shaping of modern Spain: an environmental perspective.	<p>Hughes, J.D. (2005). <i>The Mediterranean: An Environmental History</i>. Santa Barbara, California: ABC-CLIO, pp 23-56.</p> <p>Gómez-Baggethun, E., Reyes-García, V, and Montes, C. (2012). Traditional ecological knowledge and community resilience to environmental extremes: a case study in Doñana, SW Spain. <i>Global Environmental Change</i> 22 (3), 640-650.</p>
4	Ecosystems I: Forests and shrublands	<p>Rotondi et.al, (2003). Leaf xeromorphic adaptations of some plants of a coastal Mediterranean Macchia ecosystem. <i>J. Med. Ecol.</i> 4 (3-4), 25-35.</p> <p>Picazo-Tadeo, A., Reig-Martinez, E., and Estruch, V. (2009). Farming efficiency and the survival of valuable Agro-systems: a case study of rice farming in European Mediterranean Wetlands. <i>Open Environmental Sciences</i> 3, 42-51.</p>
5	Ecosystems II: coastal areas and wetlands	<p>Ortega et.al, (2004). An ecological integrity index for littoral wetlands in agricultural catchments of semiarid Mediterranean regions. <i>Environmental Management</i> 33 (3), 412-430.</p>

		Dal Bello, M. et al. (2017). Consistent patterns of spatial variability between NE Atlantic and Mediterranean rocky shores. <i>Journal of the Marine Biological Association of the United Kingdom</i> 97 (3), 539-547.
6	Fire as an Ecosystem builder and current management. Biodiversity and Protected Areas	Bond, J.W., and J.E. Keeley (2005). Fire as a global “herbivore”: The ecology and evolution of flammable ecosystems. <i>TREE</i> , 20 (7), 387-394. Keeley, J.E., Bond, W.J., Bradstock, R.A., Pausas, J.G., Rundel, P.W. (2012). <i>Fire in Mediterranean Ecosystems: Ecology, Evolution and Management</i> (pp 83-112). Cambridge, UK: Cambridge University Press.
7	Water: Living with drought, Regional differences, Challenges and Solutions I	Vargas, J.; Paneque, P. (2019). Challenges for the Integration of Water Resource and Drought-Risk Management in Spain. <i>Sustainability</i> 11, 308.
8	Water: Living with drought, Regional differences, Challenges and Solutions II	Estrela, T., Vargas, E. (2012). Drought Management Plans in the European Union. The Case of Spain. <i>Water Resource Management</i> 26, 1537–1553. Paneque, P. (2015). Drought Management Strategies in Spain. <i>Water</i> 7, 6689-6701.
9	Field trip I: Delta del Llobregat	
10	Agriculture: Food for today, food for the future	Lucas-Borja, M.E. et al., (2019). Effects of Different Land Uses (Abandoned Farmland, Intensive Agriculture and Forest) on Soil Hydrological Properties in Southern Spain. <i>Water</i> 11, 503. Malek, Z., et al. (2018). Global change effects on land management in the Mediterranean region. <i>Global Environmental Change</i> 50, 238-254. Ackerman, K., et al. (2014). Sustainable Food Systems for Future Cities: <i>The Potential of Urban Agriculture. The Economic and Social Review</i> 45 (2), 189-2016.
10	Mid-term Exam	

11	Tourism: Historical trends, mass tourism and sustainable tourism	<p>Knowles, T. And S. Curtis (1999). The market viability of European Mass-Tourist destinations. A Post-Stagnation Life-Cycle analysis. <i>International Journal of Tourism Research</i> 1, 87-96.</p> <p>Cisneros-Martínez, J.D., McCabe, S., & Fernández-Morales, A. (2018). The contribution of social tourism to sustainable tourism: a case study of seasonally adjusted programmes in Spain, <i>Journal of Sustainable Tourism</i>, 26 (1), 85-107,</p>
12	Field Trip II: Marbella beach: Tourism and Sustainable development.	
13	Climate Change in the Mediterranean: realities and challenges	<p>Lionello, P., Scarascia, L. The relation between climate change in the Mediterranean region and global warming. <i>Reg Environ Change</i> 18, 1481–1493 (2018).</p> <p>Vila-Cabrera, A. et al., (2018). Forest management for adaptation to climate change in the Mediterranean basin: A synthesis of evidence. <i>Forest Ecology and Management</i> 407 (1), 16-22.</p> <p>Lefebvre, G. et al., (2019). Predicting the vulnerability of seasonally-flooded wetlands to climate change across the Mediterranean Basin. <i>Science of the Total environment</i> 692, 546-555</p>
14	Renewable Energies in Spain Barcelona: A pioneering City in Sustainable Development	Gómez-Calvet, R., Martínez-Duart, J.M. & Serrano Calle, S. (2018). Present state and perspectives of variable renewable energies in Spain. <i>The European Physical Journal Plus</i> 133 , 126.
15		Montoya, F., Aguilera, M.J., & Manzano-Agugliaro, F. (2014). <i>Renewable and Sustainable Energy Reviews</i> 33 , 509-531.
16	Field trip III: Collserola Hike: The ecosystems around the City. Urban growth.	

17	Presentation of Research projects	
18	Final Exam	

*Number of sessions and order of assignments may vary depending on term.

BIBLIOGRAPHY

Required Readings

- Ackerman, K., et al. (2014). Sustainable Food Systems for Future Cities: *The Potential of Urban Agriculture*. *The Economic and Social Review* **45** (2), 189-2016.
- Bond, J.W., and J.E. Keeley (2005). Fire as a global “herbivore”: The ecology and evolution of flammable ecosystems. *TREE*, 20 (7), 387-394.
- Cisneros-Martínez, J.D., McCabe, S., & Fernández-Morales, A. (2018). The contribution of social tourism to sustainable tourism: a case study of seasonally adjusted programmes in Spain, *Journal of Sustainable Tourism*, **26** (1), 85-107.
- Dal Bello, M. et al. (2017). Consistent patterns of spatial variability between NE Atlantic and Mediterranean rocky shores. *Journal of the Marine Biological Association of the United Kingdom* **97** (3), 539-547.
- Estrela, T., Vargas, E. (2012). Drought Management Plans in the European Union. The Case of Spain. *Water Resource Management* **26**, 1537–1553.
- Gímez-Baggethun, E., Reyes-García, V, and Montes, C. (2012). Traditional ecological knowledge and community resilience to environmental extremes: a case study in Doñana, SW Spain. *Global Environmental Change* **22** (3), 640-650.
- Hughes, J.D. (2005). *The Mediterranean: An Environmental History*. Santa Barbara, California: ABC-CLIO, pp 1-22.
- Hughes, J.D. (2005). *The Mediterranean: An Environmental History*. Santa Barbara, California: ABC-CLIO, pp 23-56.
- Keeley, J.E., Bond, W.J., Bradstock, R.A., Pausas, J.G., Rundel, P.W. (2012). *Fire in Mediterranean Ecosystems: Ecology, Evolution and Management* (pp 83-112). Cambridge, UK: Cambridge University Press.
- Knowles, T. And S. Curtis (1999). The market viability of European Mass-Tourist destinations. A Post-Stagnation Life-Cycle analysis. *International Journal of Tourism Research* **1**, 87-96.
- Lefebvre, G. et al., (2019). Predicting the vulnerability of seasonally-flooded wetlands to climate change across the Mediterranean Basin. *Science of the Total environment* **692**, 546-555.
- Lionello, P., Scarascia, L. The relation between climate change in the Mediterranean region and global warming. *Reg Environ Change* 18, 1481–1493 (2018).
- Lucas-Borja, M.E. et al., (2019). Effects of Different Land Uses (Abandoned Farmland, Intensive Agriculture and Forest) on Soil Hydrological Properties in Southern Spain. *Water* **11**, 503.
- Malek, Z., et al. (2018). Global change effects on land management in the Mediterranean region. *Global Environmental Change* **50**, 238-254.
- Ortega et.al, (2004). An ecological integrity index for littoral wetlands in agricultural catchments of semiarid Mediterranean regions. *Environmental Management* **33** (3), 412-430.

- Paneque, P. (2015). Drought Management Strategies in Spain. *Water* **7**, 6689-6701.
- Picazo-Tadeo, A., Reig-Martinez, E., and Estruch, V. (2009). Farming efficiency and the survival of valuable Agro-systems: a case study of rice farming in European Mediterranean Wetlands. *Open Environmental Sciences* **3**, 42-51.
- Rotondi et.al, (2003). Leaf xeromorphic adaptations of some plants of a coastal Mediterranean Macchia ecosystem. *J. Med. Ecol.* **4** (3-4), 25-35.
- Suc, J.P. (1984) Origin and Evolution of the Mediterranean vegetation and climate in Europe. *Nature* **307** (2), 429-432.
- Vargas, J.; Paneque, P. (2019). Challenges for the Integration of Water Resource and Drought-Risk Management in Spain. *Sustainability* **11**, 308.
- Vila-Cabrera, A. et al., (2018). Forest management for adaptation to climate change in the Mediterranean basin: A synthesis of evidence. *Forest Ecology and Management* **407** (1), 16-22.