



Sustainable Development & Food Production in Mediterranean Landscape

Course Details

Course Designator & Number: MONT 3027

Number of Credits: 3

Language of Instruction: English

Contact Hours: 45

Instructor: Professor Lorena Ibarguen

Course Description

The course is designed to provide students with an understanding of the ecological and cultural components of the Mediterranean landscape and the sustainable development policies that shape and aim to preserve this unique environment. By focusing on key food production activities closely tied to the environmental dynamics of the region, students will be able to immerse themselves in the environmental, technical, and economic pressures the local population face. The course aims to address the main issues surrounding the intensive human use of the environment to be able to provide a growing population with healthy food in a sustainable way. We'll be paying special attention to water use, soil management, loss of biological diversity, and the challenges posed by global climate change.

Global food production poses the greatest threat to natural ecosystems and is the largest driver of environmental degradation. Therefore, the course will help students understand, reflect on, and analyze some of the ways the Mediterranean food production system in the south of France is responding to these challenges. It will focus on the three main geographical areas surrounding Montpellier: the lagoons, coastal plains, and mountains, as well as the main productive activities of each ecosystem. By focusing on the current technical innovations proposed for the region's food system development, students will be able to explore some of the main solutions currently proposed to tackle the need to produce food while conserving the natural environment and the region's cultural heritage.

A core component of this course is experiential learning. During the three site visits students will have the opportunity to engage with local actors and exchange with the community on diverse environmental issues that impact the region. They will acquire new skills through observation and hands-on supervised activities at the different sites. Following each site visit students will share what they have learned and explore how they might apply the new skills they have developed in a future workplace.

Course Objectives

- Examine the environmental, cultural, and societal components of the Mediterranean landscape surrounding the Montpellier region.
- Analyze the innovations and technological developments in food production and processing that promote healthy sustainable diets while protecting natural resources and ecosystems.
- Explore the policies used to preserve the environment as well as the challenges faced by both producers and local population.
- Understand the wider food production system challenges, including an evaluation of the connections, tensions, and synergies between the different productive activities in the region.
- Develop an awareness of the local food system within some of the Sustainable Development Goals (SDGs): ending hunger in the world, achieving food security, and sustainable agriculture (SDG 2); ensuring good health and well-being (SDG 3); halving the amount of food wasted (SDG 12.3); efficiently managing natural and other resources in consumption and production (SDG 12); reducing marine pollution (SDG 14.1), and halting land degradation worldwide (SDG 15.3).
- Throughout the semester, students will also learn to identify and evaluate credible information concerning the environment using a critical analytical approach.
- To acquire hands-on experience and practical applicable skills through experiential learning.

Methodology

- Students will be expected to engage with readings before each class and prepare regular presentations and/or written assignments.
- Participation in interactive lectures will involve actively listening and discussing the material presented in class.
- Site visits to three productive activities that are paramount to the Mediterranean region and important to France's gastronomical heritage: a cheese production farm in the

Cevennes mountains, a vineyard around the Pic Saint-Loup, and an oyster production cooperative in the Thau Basin.

- Based on these three practical examples, students will be able to identify and critically analyze food production and sustainability issues in the three main landscapes.
- Students will critically analyze the local case study material within the framework of SDGs.

Experiential Learning & Field Visits

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Required Reading / Materials

- Bernard Claire, et al. 2023. Innovation brokers in High Nature Value farming areas: A strategic approach to engage effective socioeconomic and agroecological dynamics. *Ecology and Society*, **28** (1):20. pp.83. hal-01699763.
- Buestel, D., Ropert, M., Prou, J., & Gouletquer, P. (2009). History, status, and future of oyster culture in France. *Journal of Shellfish Research*, **28**(4), 813-820.
- Burlingame, B., & Dernini, S. (2011). Sustainable diets: The Mediterranean diet as an example. *Public Health Nutrition*, **14**(12A), 2285-2287. doi:10.1017/S1368980011002527
- Capone, R., Fersino, V., Stamatakis, E., Cerezo, M., Kessari, M., DERNINI, S., & el Bilali, H. (2021). Sustainability of Food Systems in the Mediterranean Region. *New Medit*, **20**(3). <https://doi.org/10.30682/nmsi21i>
- Charters, S., Demossier, M., Dutton, J., Harding, G., Smith Maguire, J., Marks, D., & Unwin, T. (Eds.). (2021). *The Routledge Handbook of Wine and Culture* (1st ed.). Routledge. <https://doi.org/10.4324/9781003034711>
- Clélia Sirami, Amélie Nespoulous, Jean-Paul Cheylan, Pascal Marty, Glen T. Hvenegaard, Philippe Geniez, Bertrand Schatz, Jean-Louis Martin. Long-term anthropogenic and ecological dynamics of a Mediterranean landscape: Impacts on multiple taxa, *Landscape and Urban Planning*, Volume 96, Issue 4, 2010.
- EAT (2019). *Food Planet Health: Healthy Diets From Sustainable Food Systems*. Summary Report. Retrieved from

https://eatforum.org/content/uploads/2019/07/EAT-Lancet_Commission_Summary_Report.pdf

- ElBilali,H.; Strassner,C.; Ben Hassen, T. Sustainable Agri-Food Systems: Environment, Economy, Society, and Policy. *Sustainability* **2021**, 13,6260.
<https://www.mdpi.com/2071-1050/13/11/6260>
- Eyhorn, F., Muller, A., Reganold, J.P. et al. Sustainability in global agriculture driven by organic farming. *Nat Sustain* 2, 253–255 (2019).
<https://doi.org/10.1038/s41893-019-0266-6>
- Gabrielle Bouleau, Sylvain Barone, Pierre Maurel, Audrey Richard, Géraldine Abrami, et al.. I-Five: Innovative Instruments and institutions in implementing the water framework directive French case study report: implementing the WFD on the Thau basin. [Research Report] 2.3, IWRM-NET. 2009.
- García-Martín, M., Torralba, M., Quintas-Soriano, C. et al. Linking food systems and landscape sustainability in the Mediterranean region. *Landscape Ecol* 36, 2259–2275 (2021). <https://doi.org/10.1007/s10980-020-01168-5>
- Louis-Antoine Saïssset, Iciar Pavez, Leïla Temri. Governance, innovation and sustainability: an exploratory study on French wine co-ops. ICA CCR Europe Research Conference "cooperatives in transition facing crisis," Jul 2021, Online Conference, France. (hal-03285025)
- Meran, G., Siehlow, M., von Hirschhausen, C. (2021). Integrated Water Resource Management: Principles and Applications. In: The Economics of Water. Springer Water. Springer, Cham. https://doi.org/10.1007/978-3-030-48485-9_3
- Teja Tschardtke, Ingo Grass, Thomas C. Wanger, Catrin Westphal, Péter Batáry. Beyond organic farming—harnessing biodiversity-friendly landscapes, *Trends in Ecology & Evolution*, Volume 36, Issue 10,2021.
- UN Report. 2022. Promotion and strengthening of sustainable ocean-based economies. Report prepared by Dr. Marjo Kristina Vierros.
https://sdgs.un.org/sites/default/files/2022-01/2014248-DESA-Oceans_Sustainable_financial-WEB.pdf
- UNEP/MAP (2016). Mediterranean Strategy for Sustainable Development 2016-2025. Valbonne. Plan Bleu, Regional Activity Centre.

Grading

Grading Rubric

Letter Grade	Score or Percentage	Description
A	93–100	Achievement that is outstanding relative to the level necessary to meet course requirements.
A-	90–92	Achievement that is significantly above the level necessary to meet course requirements.
B+	87–89	
B	83–86	
B-	80–82	Achievement that meets the course requirements in every respect.
C+	77–79	
C	73–76	
C-	70–72	Achievement that is worthy of credit even though it fails to fully meet the course requirements.
D+	67–69	
D	60–66	
F	0–59	Represents failure (or no credit) and signifies that the work was either (1) completed but at a level of achievement that is not worthy of credit or (2) was not completed and there was no agreement between the instructor and the student that the student would be awarded an I.

Summary of How Grades Are Weighted

Assignments	Percentage of Grade
Participation in class	10%
Essays	25%
Group presentations	15%
Quizzes	20%
Final project	30%
Overall grade	100%

Assessment Details

Participation in class

Attendance and active participation in class is very important to student success in this course. Students should be present at all classes and come prepared to discuss the readings as outlined in the syllabus.

Essays

Students will complete 3 essays/written assignments; each essay will be between 2–4 pages in length and will be based on those different topics discussed in class. Essays will explore the underlying scientific principles behind the environmental issues being examined. The topics of these assignments will be directly related to the readings or the works at the heart of the current unit being studied. An example of a topic might be an analysis of the limitations of technologies and the constraints of science on the public policy issues being considered. Written assignments should aim to include an average of three citations per page. Students will be asked to include references (the nature and number of these references will vary depending on the type of assignment; 3–4 sources is a rough estimate).

Group presentations

Students will complete a group presentation that should last 10 to 15 minutes. The presentations will be based on the site visits and will explore environmental issues related to

these locations. Each of these studies will expose students to the complexities policy makers face when addressing the environmental challenges specific to the south of France.

Quizzes

Students will be tested regularly on course readings and lectures. Each quiz will focus on a specific aspect of the environmental dynamics in the region.

Final written paper

Each student will write an 8–10 page research paper that they will present to the class (15 minutes) the last session of the course. The student should choose a topic related to the course material that they wish to explore in greater detail and share with the rest of the class. By the halfway point of the course, students should begin to have an idea of the approach they would like to take and consult with the instructor to narrow down their topic. Students should include roughly an average of 3–4 citations per page and use 6–9 outside sources (this is an estimate and will depend upon the topic chosen).

Course Content

Unit 1

Course Introduction: Natural Resources & Agricultural Production

- Introduction: course objective and presentation of syllabus
- Lecture: Introduction to the linkages between food systems, natural resources, and to concepts of circular production systems, food security and sustainable diets.
- Activity on circular production system
- International cooperation mechanisms: *SDG 2. End hunger, achieve food security and improve nutrition and promote sustainable agriculture.*
- Reading:
 - Reading EAT (2019). Food Planet Health: Healthy Diets From Sustainable Food Systems. Summary Report.

Unit 2

Main Components of the Mediterranean Landscape

- Lecture: An introduction to the main components of the Mediterranean Landscape, including bio-geographical data but also the built heritage, man made landscape characteristics and intangible associations. We will specifically delve into The Causses and the Cévennes, Mediterranean agro-pastoral cultural landscape and address traditional ecological knowledge.
- Class activity on UNESCO world heritage sites.
- Reading:
 - García-Martín, M., Torralba, M., Quintas-Soriano, C. et al. Linking food systems and landscape sustainability in the Mediterranean region. *Landscape Ecol* **36**, 2259–2275 (2021).
 - UNEP/MAP (2016). Mediterranean Strategy for Sustainable Development 2016-2025. Valbonne. Plan Bleu, Regional Activity Centre.

Unit 3

The Mediterranean Diet

- Lecture on social, cultural, health and economic dimensions of the Mediterranean Diet. An introduction to the concept of environmental agricultural diversity and conservation of
- Class activity: sustainable diets
- International cooperation mechanisms
- Reading:
 - Burlingame, B., & Dernini, S. (2011). Sustainable diets: The Mediterranean diet as an example. *Public Health Nutrition*, 14(12A), 2285-2287. doi:10.1017/S1368980011002527

Unit 4

Site Visit: Cevennes Museum & Goats' Cheese Production Farm

Unit 5

Integrated Water Resource Management (IWRM)

- Lecture on IWRM framework that describes the interaction between farm level activities and objectives with environmental and natural resource goals and constraints. We'll reflect on a systems approach to the study of water resources, based on principles of sustainability
- International cooperation mechanisms: The Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention)/The Protocol on Water and Health, jointly serviced by UNECE and WHO-Europe, (legally binding instrument)
- Class activity: Case studies of IWRM
- Reading:
 - Meran, G., Siehlow, M., von Hirschhausen, C. (2021). Integrated Water Resource Management: Principles and Applications. In: The Economics of Water. Springer Water. Springer, Cham. https://doi.org/10.1007/978-3-030-48485-9_3

Unit 6

Sustainable Ocean-Based Economies

- Lecture on "The blue economy," or sustainable ocean-based economies that include a wide range of ocean based economic sectors and related policies in a manner that is both environmentally sustainable and socially equitable.
- International cooperation mechanisms: SDG 14, Sustainable Blue Economy Conference Nairobi 2018
- Class activity: Watching and critically analyzing "Seapiracy" documentary
- Reading:
 - UN Report. 2022. Promotion and strengthening of sustainable ocean-based economies. Report prepared by Dr. Marjo Kristina Vierros.

https://sdgs.un.org/sites/default/files/2022-01/2014248-DESA-Oceans_Sustainable_final-WEB.pdf

- Buestel, D., Ropert, M., Prou, J., & Gouletquer, P. (2009). History, status, and future of oyster culture in France. *Journal of Shellfish Research*, 28(4), 813-820.

Unit 7

Site Visit: Museum (Bouzigues) & Oyster Cooperative in Thau Lagoon

Unit 8

Main Issues & Controversies of Biological Agriculture

- Lecture on the current model of agricultural intensification, based on agrochemical inputs and large monocultures associated with increased yields, but also with severe losses of biodiversity and ecosystem services. We will see the alternative of certified organic farming, together with its main strengths, trade-offs, and controversies.
- Class activity: Can farmers grow money? | DW Documentary
<https://www.youtube.com/watch?v=QAdw7N9l1tM>
- International cooperation mechanisms: FOAM—Organics International; SDG
- Readings:
 - Eyhorn, F., Muller, A., Reganold, J.P. et al. Sustainability in global agriculture driven by organic farming. *Nat Sustain* 2, 253–255 (2019).
<https://doi.org/10.1038/s41893-019-0266-6>
 - Teja Tschardtke, Ingo Grass, Thomas C. Wanger, Catrin Westphal, Péter Batáry. Beyond organic farming—harnessing biodiversity-friendly landscapes, *Trends in Ecology & Evolution*, Volume 36, Issue 10, 2021.

Unit 9

Cultural-Historical Importance of Wine Production in France

- Lecture on wine production in France not only as a major source of revenue, but also as a symbol of national pride and identity. It has long been an integral part of the country's culture and history. Students will observe the link between food products, the manner

they are produced in specific areas known in France as 'terroirs,' and the ecological quality and cultural resonance of rural landscapes.

- Class activity: Terroir agricultural products and protected designation of origin labels.
- Reading:
 - Charters, S., Demossier, M., Dutton, J., Harding, G., Smith Maguire, J., Marks, D., & Unwin, T. (Eds.). (2021). *The Routledge Handbook of Wine and Culture* (1st ed.). Routledge. <https://doi.org/10.4324/9781003034711>
 - Clélia Sirami, Amélie Nespoulous, Jean-Paul Cheylan, Pascal Marty, Glen T. Hvenegaard, Philippe Geniez, Bertrand Schatz, Jean-Louis Martin. Long-term anthropogenic and ecological dynamics of a Mediterranean landscape: Impacts on multiple taxa, *Landscape and Urban Planning*, Volume 96, Issue 4, 2010.

Unit 10

Site Visit: Vineyard in Pic Saint Loup

Unit 11

Innovations & Challenges of the Mediterranean Productive Landscape

- Lecture involving an overview of subjects seen during the semester and making special emphasis on a few innovations and challenges of the three productive activities focus of the course.
- Readings:
 - Louis-Antoine Saisset, Iciar Pavez, Leïla Temri. Governance, innovation and sustainability: an exploratory study on French wine co-ops. *ICA CCR Europe Research Conference "cooperatives in transition facing crisis,"* Jul 2021, Online Conference, France. (hal-03285025)
 - Gabrielle Bouleau, Sylvain Barone, Pierre Maurel, Audrey Richard, Géraldine Abrami, et al.. I-Five: Innovative Instruments and institutions in implementing the water framework directive French case study report: implementing the WFD on the Thau basin. [Research Report] 2.3, IWRM-NET. 2009.
 - Bernard Claire, et al. 2023. Innovation brokers in High Nature Value farming areas: A strategic approach to engage effective socioeconomic and agroecological dynamics. *Ecology and Society*, **28** (1):20. pp.83. hal-01699763.

Unit 12

Class Presentations of Site Visits

- In the beginning of the semester, the class will be divided into three large groups that will work on oral presentations of site visits to Cevennes, Bouzigues, and Pic Saint Loup.

Unit 13

Final Exam

Policies

Attendance Policy

Students are expected to be on time and attend all classes while abroad. Many instructors assess both attendance and participation when assigning a final course grade. Attendance alone does not guarantee a positive participation grade; the student should be prepared for class and engage in class discussion. See the on-site syllabus for specific class requirements.

University of Minnesota Policies & Procedures

Academic integrity is essential to a positive teaching and learning environment. All students enrolled in University courses are expected to complete coursework responsibilities with fairness and honesty. Failure to do so by seeking unfair advantage over others or misrepresenting someone else's work as your own can result in disciplinary action. The University Student Conduct Code defines scholastic dishonesty as follows:

Scholastic Dishonesty

Scholastic dishonesty means plagiarizing; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; altering forging, or misusing a University academic record; or fabricating or falsifying data, research procedures, or data analysis.

Within this course, a student responsible for scholastic dishonesty can be assigned a penalty up to and including an "F" or "N" for the course. If you have any questions regarding the expectations for a specific assignment or exam, ask.

Student Conduct

The University of Minnesota has specific policies concerning student conduct. This information can be found [on the Learning Abroad Center website](#).