

EAS 553
Diverse Farming Systems: Theory and Practice
M & W 1:00-2:30
3 credits

Note: The course includes two all day Saturday activities/workdays (October 2 and October 23). This may need to be modified based on the COVID-19 situation

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Office Hours: Monday 2:30-3:30 or by appointment

For the safety of all students, faculty, and staff on campus, it is important for each of us to be mindful of safety measures that have been required for our protection. By returning to campus, you have acknowledged your responsibility for protecting the collective health of our community.

Course lectures may be audio/video recorded and made available to other students in this course. As part of your participation in this course, you may be recorded. If you do not wish to be recorded, please contact me (Ivette Perfecto) the first week of class (or as soon as you enroll in the course, whichever is latest) to discuss alternative arrangements.

To view recorded lectures, go to:
<http://leccap.engin.umich.edu/leccap/site/p5au03pdf7vtsregms>

Course Description: In this multidisciplinary course, we will critically explore an intersecting literature on agroecology, biodiversity, ecosystem services, diversified farming systems, agroforestry, and farmer's livelihoods. The first part of the course will focus on the application of ecological theory to diverse farming systems, particularly intercropping and agroforestry. The second part will emphasize biodiversity both in terms of how agricultural landscapes affect biodiversity and how biodiversity contributes to the sustainability, productivity and resilience of agroecosystems and farming communities. Finally, the last part will discuss the concept of "the new peasantries" as developed by van der Ploeg (2009) and its connection with diverse farming systems as well as the rural social movements that promote diverse farming systems, agroecology and food sovereignty.

Class Format: Class meetings will involve lectures and discussions. In addition, we will meet three Saturdays for three full workdays.

Course Schedule:

Part I. A Theoretical Framework for Intercropping and Agroforestry	
Week 1 (Aug/30-Sep/3)	Introduction: An overview of diverse farming systems
	Definitions and quantitative evaluations of intercrops and agroforestry
Week 2 (Sep 6-10)	Sep 6: Labor Day – NO CLASS
	Competitive production principle
Week 3 (Sep 13-17)	Effect and response in intercropping and agroforestry
	Facilitative production principle
Week 4 (Sep 20-24)	Environmental grain and adaptive function
	Facilitation through environmental modification: nutrient utilization
Week 5 (Sep 27-Oct 1)	Facilitation through environmental modification: herbivores and natural enemies
	Facilitation and competition in alley cropping systems
Saturday, Oct 2 All Day	ACTIVITY #1: Intercropping Experiments (UM Campus Farm)
Part II. Diverse Farming Systems and Biodiversity	
Week 6 (Oct 4-8)	Biodiversity conservation in agroecosystems
	The agroecological matrix
Week 7 (Oct 11-15)	Oct 11: EXAM I
	The agroecological matrix and zoonoses
Week 8 (Oct 18-22)	Oct 18: Fall Break – NO CLASS
	Land sparing/land sharing debate
Saturday, Oct 23 All Day	ACTIVITY #2: Azteca Chess Game Lecture: Ecological complexity in the coffee agroecosystem
Week 9 (Oct 25-29)	Yield and biodiversity
	Multiple ecosystem services in agroecosystems
Week 10 (Nov 1-5)	Diverse farming systems and climate change
Week 11 (Nov 8-12)	Diverse farming systems in practice: traditional systems
Part III. Socio-Political Aspects of Diverse Farming Systems	
Week 12 (Nov 15-19)	Diverse farming systems and the new peasantry approach
Week 13 (Nov 22-26)	Diverse farming systems and the new peasantry approach
	Nov 24: NO CLASS
Week 14 (Nov 29-Dec 3)	Discussion <i>The New Peasantry</i>
	Discussion <i>The New Peasantry</i>
Week 15 (Dec 6-10)	Discussion <i>The New Peasantry</i>
	Dec 8: Group Presentations - Michigan Farmers and the New Peasantry
Dec 15	Final Exam (1:30-3:30)

Required Books:

Vandermeer , J. 1992. *The Ecology of Intercropping*. Cambridge University Press.
 Perfecto, I., J. Vandermeer and A. Wright. (2019 edition preferred). *Nature's Matrix: Linking Agriculture, Conservation and Food Sovereignty*. Earthscan.
 Van der Ploeg, J. D. 2009. *The New Peasantries: Struggles for Autonomy and Sustainability in an Era of Empire and Globalization*. Routledge
 NOTE: All three books are available online through Mirlyn

Course pack:

Readings available in the Canvas site for the course

Evaluation:

Exam 1	20%	Oct 11
Exam 2	20%	Dec 15
Assignment 1 (Intercrop and AF Eval.)	5%	Sep 13
Assignment 2 (Intercrop, Competition and Facilitation)	5%	Sep 27
Assignment 3 (Intercropping Experiment; Group Project)	10%	Oct 20
Assignment 4 (Azteca Chess Game)	5%	Nov 1
Review Paper (Biodiversity and Diverse Farming Systems)	15%	Nov 22
Peasant Balances Presentations; Group Project	5%	Dec 8
Peasant Balances Written Paper	5%	Dec 8
Reflections on readings	5%	
Discussion Participation	5%	

Review Paper (Biodiversity and Diverse Farming Systems):

This is a regular literature review paper on a topic related to biodiversity and diverse farming systems. The paper is due on **November 22**, and should include an abstract, introduction, main arguments (with subtopics when necessary), discussion/conclusion and reference cited. The paper should be 10 to 15 pages (doubled spaced) and should be written in a publishable form using the scientific style and standard format for reference (for examples, looked at published papers in the field).

Late Assignment Policy:

For the sake of fairness to all students in the course, deadlines will be strictly enforced. Unless you've made prior arrangements, lateness will impact your grade (10% for every day). If you have trouble completing a particular assignment, this must be discussed

with me before the deadline. At the end of the semester, students will be assigned a letter grade on the basis of the work that has been completed.

Academic Honesty:

All students are responsible for maintaining the highest standards of honesty and integrity in every phase of their academic career. The penalties for academic dishonesty are severe; ignorance of what constitutes dishonesty (including plagiarism) is not an acceptable defense.

Websites:

1st World Congress of Agroforestry - <http://conference.ifas.ufl.edu/WCA/>
 Agri Cultures Network (Center for Learning on Sustainable Agriculture) - <http://www.agriculturesnetwork.org/>
 Agroecology Research Action Collective - <https://agroecologyresearchaction.org/>
 Agroforestry Net - <http://agroforestry.net/>
 Association of Temperate Agroforestry - <http://www.aftaweb.org/>
 Bioversity International - <http://www.bioversityinternational.org/>
 Center for Agroecology and Sustainable Food Systems - <https://casfs.ucsc.edu/>
 Center for Agroforestry of the University of Missouri - <http://www.centerforagroforestry.org/>
 Center for Diversified Farming Systems - <http://food.berkeley.edu/dfs/>
 Center for Environmental Farming Systems (UCSU) - <https://cefs.ncsu.edu/category/agroecology/>
 Center for International Forestry Research (CIFOR) - <http://www.cifor.org/>
 European Commission Organic Farming - <http://ec.europa.eu/agriculture/organic/>
 Farm Woodland Forum - <http://www.agroforestry.ac.uk/>
 Food Sovereignty Alliance - <http://usfoodsovereigntyalliance.org/what-is-food-sovereignty/>
 International Federation of Organic Agriculture Movements (IFOAM) - <http://www.ifoam.org/>
 La Via Campesina - <https://viacampesina.org/en/>
 Land Institute - <http://www.landinstitute.org/>
 Leopold Center for Sustainable Agriculture - <http://www.leopold.iastate.edu/organic>
 National Family Farm Coalition - <https://nffc.net/what-we-do/food-sovereignty/>
 North Shore Agroecology Center (Finland) - <https://wtfinland.com/businesses-and-organizations/north-shore-agroecology-center/>
 Research Institute of Organic Agriculture (FiBL) - <http://www.ifoam.org/>
 Rodale Institute - <http://rodaleinstitute.org/>
 Sustainable Agriculture Research and Education - <http://www.sare.org/>
 USDA Agroforestry - <http://www.usda.gov/wps/portal/usda/usdahome?navid=agroforestry>
 Sustainable Food System Initiative (University of Michigan) <https://sites.lsa.umich.edu/sustainablefoodsystems/>

University of Michigan Campus Farm - <https://mbgna.umich.edu/matthaei-botanical-gardens/campus-farm/>

USDA Alternative Farming Systems Information Center (AFSIC) - <http://afsic.nal.usda.gov/>

USDA National Agroforestry Center - <http://nac.unl.edu/>

USDA Organic Agriculture -

<http://www.usda.gov/wps/portal/usda/usdahome?contentidonly=true&contentid=organic-agriculture.html>

World Agroforestry Center - <http://www.worldagroforestrycentre.org/>