APBI265 Sustainable Agriculture and Food Systems

Principles and practices necessary to understand practical concerns of sustainable food systems. Credit will be given for only one of APBI 265 or APBI 260. [1-3-0]

Course description: This course in sustainable food and farming systems is designed as an essential primer for students with backgrounds in humanities, natural, or social sciences with interests in further studies, or with broad career goals based in agriculture, food, human and ecological health. APBI265 will also serve as the introductory course in the UBC Farm Practicum series, open to students who have been accepted into the practicum and do not already have APBI265. This course will be appropriate for any student intending to pursue applied placements in agricultural settings for international or community studies programs.

A broad survey of reading in the literatures of agroecology and agricultural sustainability science, coupled with engaged online discussion seminars and reflective writing, comprises the first section of the course entitled, "agroecology and the search for sustainable agriculture". Students will explore and debate the legacies of 20th century agricultural practices utilizing a framework of agroecological indicators and strategies for evaluating sustainable food and farming systems.

In the second section of the course, the biophysical and social foundations of agriculture are the main focal points. Students will develop an understanding of soil formation factors, and of the historical relationships and interdependencies between humankind and soils, facilitated by debate and discussion seminars, concept quizzes, and reflective writing.

The third, and final section of the course provides practical lessons in seed starting techniques, and builds team-based and experiential learning skills through an evaluation of farm case studies final review project.

Each section, or learning module, of the course will encompass approximately four weeks of readings, discussion, concept quizzes, reflective writing, and other listed assignments.

Course learning objectives:

By the end of this course, successful students will (be able to):

- Connect underlying agroecosystem concepts and soil science fundamentals with principles and practices of sustainable farming.
- Critically assess the impacts of capital-intensive, industrial-scaled agriculture, and demonstrate a foundation of skills for the design and management of sustainable food and farming systems.

- Apply skills in seed starting and demonstrate basic performance and understanding of creating soil seedling blends.
- Trace their unique learning pathways, and articulate individual learning objectives for further studies in agriculture, food and human health.
- Demonstrate solid team-based skills for performance of field and case studies research.

Course grading/marks and evaluation:

Course #	**Assessment strategy**	**Marks (%)**
APBI265	Discussion and participation	10
	Concept quizzes	15
	Online learning journal	15
	Individual academic and reflective review paper (proposal 5%)	30
	Team case study review (proposal 5%)	30
	TOTAL	***100%***

Course calendar and assignments:

Module 1. Agroecology and the search for sustainable agriculture	**Specific learning outcomes for this online module:** 1. Identify and assess the impacts and critique of capital-intensive, industrial-scaled agriculture. 2. Demonstrate the ability to articulate the connections between agroecological principles and community to regional-scaled farming systems. 3. Identify and discuss a set of strategies for designing sustainable farming systems with agroecological principles.

Assigned reading:

Altieri, M.A. 2004. Linking ecologists and traditional farmers in the search for sustainable agriculture. *Frontiers in Ecology and the Environment, 2*, 35-42.

Gliessman, S.R. (2007). The need for sustainable production systems in *Agroecology: the ecology of sustainable food systems* (pp. 3-21). Boca Raton, FL: Taylor and Francis.

Gliessman, S.R. (2007). The agroecosystem concept in *Agroecology: the ecology of sustainable food systems* (pp. 23-32). Boca Raton, FL: Taylor and Francis.

Pimentel, D., Hepperly, P., Hanson, J., Douds, D., Siedel, R. (2005), Environmental, Energetic and Economic Comparisons of Organic and Conventional Farming Systems, *Bioscience, 55* (7), 573-582.

Pretty, J., Sutherland, W.J., Ashby, J., Auburn J., Baulcombe, D., Bell, M…and Pilgram, S. (2010). The top 100 questions of importance to the future of global agriculture. *International Journal of Agricultural Sustainability, 8*,(4), 219-236

Four written and discussion-based assignments for module #1:
1. Participation in reading discussion and debate
2. Concept quiz #1
3. Learning journal #1
4. Proposal for individual academic and reflective review paper (5%)

Module 2. **Connecting soil science with sustainable farming practices**	**Specific learning outcomes for this online module:** 1. Identify and discuss the role soils and soil management practices have played in selected historical farming systems. 2. Identify five factors of soil formation and discuss the roles inherent soil properties play in sustainable agriculture decision-making. 3. Identify and discuss the role dynamic soil properties play with sustainable agriculture decision-making.

Assigned reading:
Brady, N.C. and Weil, R.R. (2002). The soils around us. in *The nature and properties of soils* (pp. 2-30). Upper Saddle River, NJ: Prentice Hall Press.

Brady, N.C. and Weil, R.R. (2002). Formation of soils from parent materials in *The nature and properties of soils* (pp. 31-74). Upper Saddle River, NJ: Prentice Hall Press.

Brady, N.C. and Weil, R.R. (2002). Carbon balance in the soil-plant-atmosphere system, and Factors and practices influencing soil organic matter levels. in *The nature and properties of soils* (pp. 524-532). Upper Saddle River, NJ: Prentice Hall Press.

Krzic, M., K. Wiseman, L. Dampier, and D. Gaumont-Guay.(2004). SoilWeb200: an on-line teaching tool for APBI 200 course. The University of British Columbia, Vancouver [http://www.landfood.ubc.ca/soil200/index.htm]

Luzzadder-Beach, S. and Beach, T. (2006). Wetlands as the intersection of soils, water, and indigenous human society in the Americas. in J.R. McNeill and V.Winiwarter (Eds)

Soils and societies: perspectives from environmental history (pp.91-117). Isle of Harris, UK: Whitehorse Press.

Four written and discussion-based assignments for module #2:
1. Participation in reading discussion and debate
2. Concept quiz #2
3. Learning journal #2
4. Individual academic and reflective review essay (25%)

<u>Module 3.</u> Seed to fork: Introduction to seed starting and farm case studies	**Specific learning outcomes for this online module:** 1. Identify life-habits and basic seed-plant morphology of cultivated crops 2. Compare and discuss benefits and drawbacks of various seedling transplant media with respect to the goals of sustainable farming. 3. Team review of case-study models of regional farming operations: characterize and evaluate farming systems within the agroecosystems framework. 4. Feedback and review of collected learning journals

Pretty, J. (2005). Social capital and the collective management of resources in J.Pretty (Ed.) *The Earthscan Reader in Sustainable Agriculture* (pp. 173-178). London, UK: Earthscan.

Riseman, A. 2007. Garden Genetics: Seed Saving. *Unpublished workshop manual*.

Shry, C.L. and Reiley, H.E. (2011). "Unit 6: Seeds" in *Introductory horticulture* (pp. 74-86). Clifton Park, NY: Delmar Cengage Learning.

Selected UBC Farm Agroecological case study reports and scenarios drawn from faculty-led on-farm research reports

Five written and discussion-based assignments for module #3:
1. Participation in reading discussion and debate
2. Concept quiz #3
3. Learning journal #3
4. Team case study proposal (5%)
5. Complete team case study review paper (25%)