

GRASSLAND ECOLOGY

Agronomy 370 | Botany 370 | Soils 370

3 credits | T R 9:30-10:45 | 1120 Biochemistry

Instructors: **Randy Jackson (Agronomy) and Dick Cates (Soil Science)**

TA: **Andy Jakubowski (Plant Breeding & Plant Genetics)**

Course objective: Develop the ability to describe, understand, and predict grassland phenomena from global to local perspectives.

Pre-requisites: Intro course in Agronomy, Botany, Soil Science, or Bot/Zoo 151-152, or Biocore 301 or 333.

Grading: Assignments 50%, Mid-term 20%, Final 30%

Required book: **Manning** (1995) Grassland: The History, Biology, Politics and Promise of the American Prairie

Reference texts: **Gibson** (2010) Grasses and Grassland Ecology; **Wedin & Fales** (2009) Grassland: Quietness and Strength for a New American Agriculture; **Brady & Weil** (2010) Elements of the nature and properties of soils; **Franzluebbbers** (2011) Farming with Grass: Achieving Sustainable Mixed Agricultural Landscapes (http://www.swcs.org/en/publications/farming_with_grass/); **Curtis** (1971) Vegetation of Wisconsin, UW Press; **Cochran & Iltis** (2000) [Atlas of the Wisconsin Prairie and Savanna Flora. WI DNR and UW-Madison Herbarium](#). Tech Bull No. 191

Course website: <https://courses.moodle.wisc.edu>

Syllabus:

Week	Lecture 1	Lecture 2	Assignments
1	9/4 1-Introduction, philosophy, expectations (Jackson/Cates)	9/6 2-The grassland biome (Jakubowski)	#1 Describe yourself and what grassland means to you!
2	9/11 3-Historic development of the tallgrass prairie in the upper Midwest USA (Cates) Reading: Changnon et al. 2003	9/13 4-Ecosystem services (Jackson) Reading: Dominati et al. 2005	Read Manning Ch. 1-8
3	9/18 5-Soils 101 for the budding grassland ecologist (Cates)	9/20 6-Grassland soils formation and development (Cates)	#2 Attend & report on one of the lectures at the Wisconsin Ecology Fall Symposium – Thurs, 20 Sep 4-5p; Fri 21 Sep 1-4p (http://ecology.wisc.edu/symposium/index.php)
4	9/25 7-Grasses as individuals and populations (Jackson) Reading: Ferraro and Oosterheld 2002	9/27 8-Discuss Manning Chs. 1-8 (Cates/Jackson)	#3 Saturday 9/29 - Field trip to Arlington ARS (depart 8.30a, return 1p) Read Manning, Ch. 9-15

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5	10/2 9-Grassland genetics and evolution (Jakubowski)	10/4 10-What happened to megafauna of the NA prairie? (Ribic) Readings: Ribic and Sample 2001	
6	10/9 11-Principles of Managed Grazing (Cates) Readings: Oates et al. 2011	10/11 12-Environmental impacts of managed grazing (Cates) Reading: Chs 6&7, Wedin & Fales	#4 Saturday 10/13 - Field trip to Cates Family Farm (depart 8.30a, return 1p)
7	10/16 13-Describing grassland plant communities, composition, diversity, and abundance (Jackson)	10/18 Discuss Manning, Chs. 9-15	
8	10/23 15-Grassland succession (Jackson) Behnke & Scoones 1993	10/25 16-Nitrogen cycle (Jackson/Collins) Midterm available	
9	10/30 17- N-cycle game (Collins)	11/1 18- N-cycle follow on discussion Reading: deVries & Bardgett 2012 Midterm due	#5 N-cycle exercise
10	11/6 19-Grassland microbes-a black box? (Duncan) Reading: van der Heidjen 2008	11/8 20-Grassland mesofauna & food webs (Gratton)	
11	11/13 21-Grassland ecosystem ecology - NPP, decomposition, C & N cycling (Jackson)	11/15 22-Introduction to PEWI landscape modeling tool (Jackson)	#6 Landscape modeling exercise
12	11/20 No class	11/22 THANKSGIVING	

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13	11/27 23-Grassland systems of the world (Jackson) ...Grazing systems of the world: Examples from Saudi Arabia, South Africa (Cates)	11/29 24-Grassland systems of the world, cont'd with examples from Azerbaijan, China, Mexico, Moldova (Cates)	
14	12/4 reports	12/6 reports	
15	12/11 reports	12/13 reports & Course Summary (Jackson/Cates) Final exam available: 10.45am	
16	12/18 Take-home final exam due: 5pm		