

ATTACHMENT 4C-2

GRADUATE CERTIFICATE IN SUSTAINABILITY (SUSTGC)

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Sustainability Curriculum Steering Committee:

Professor Stephen Boss, co-director, Geosciences
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Associate Dean Carol Gattis, Honors College
Professor Kevin Fitzpatrick, Sociology
Professor Jon Johnson, Management
Professor Kim LaScola Needy, Industrial Engineering
Professor Marty Matlock, Biological and Agricultural Engineering
Professor Jennie Popp, Agricultural Economics and Agribusiness
Research Assistant Professor Harrison Pittman, Agricultural Law
Assistant Professor Gregory Benton, Recreation and Sports Management

The Graduate Certificate in Sustainability is interdisciplinary, drawing from faculty and course work across all colleges of the University of Arkansas. The graduate certificate is accessible to a broad cross-section of students admitted to the Graduate School, regardless of degree program, or to students admissible to the Graduate School to participate in advanced study in Sustainability. The purpose of the Graduate Certificate in Sustainability is to provide functional graduate-level knowledge and skills related to the emerging discipline of Sustainability organized around four thematic areas reflecting strength in scholarship of University of Arkansas academic colleges: Sustainability of Social Systems, Sustainability of Natural Systems, Sustainability of Built Systems, and Sustainability of Managed Systems. Students who complete the graduate certificate in Sustainability will be expected to:

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1. Articulate commonly accepted definitions of sustainability and discuss various nuances among those definitions as well as engage in analytical thinking to enhance sustainability measures;
2. Address real-world problems of sustainability to reinforce their professional interests.
3. Have an understanding of the interdisciplinary nature of sustainability issues, particularly as they pertain to the thematic areas of knowledge addressed by the graduate certificate (sustainability of natural systems, sustainability of managed systems, sustainability of built systems, and sustainability of human social systems);
4. Be conversant regarding acquisition and analysis of data pertinent to measuring sustainability;
5. Communicate orally, and in writing organized thoughts defining sustainability measures and technical aspects of sustainability;
6. Identify potential strategies to address sustainability using appropriate analytical methods and data and provide results of analyses of data using novel metrics or statistics;
7. Make recommendations, based on data analysis and interpretation, to advance sustainability of individuals or institutions.
8. Develop methods, techniques and tools for implementing sustainability initiatives.

Required Courses for the Graduate Certificate in Sustainability – U. of Arkansas Fayetteville

Students must earn a grade of 'B' or better for all courses used to fulfill requirements of the Graduate Certificate in Sustainability.

Hours	Courses
3	WCOB 5023 Sustainability; Required course for the Graduate Certificate
12	Elective courses with sustainability focus selected from a broad menu of offerings in four thematic areas: Sustainability of Social Systems Sustainability of Natural Systems Sustainability of Built Systems Sustainability of Managed Systems

Elective courses must be completed in at least two thematic areas. In addition, 9 of these 12 hours must be in courses numbered 5000 or above.

Complete lists of elective courses by thematic areas are presented below. In an effort to maintain relevance and timeliness of the Graduate Certificate in Sustainability program, new graduate courses developed with sustainability focus

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can be considered for inclusion among the menu of approved courses by submitting course descriptions and course syllabi for review to the Sustainability Curriculum Steering Committee (SCSC). The SCSC will issue annual calls for courses to be considered and will review submitted course materials to determine their appropriateness to the Graduate Certificate and to place the course in the appropriate thematic area within the catalog description of the Graduate Certificate in Sustainability.

List of Available Elective Courses (students choose 12 hours from at least 2 thematic areas from menus below; at least 9 hours must be chosen from courses numbered 5000 or above):

Sustainability of Natural Systems Courses

Course #	Course Title	Hours	Prerequisites
BENG 5933	Environmental and Ecological Risk Assessment	3	Graduate Standing
BENG 5351	Sustainability Seminar	1	CHEM 1123
BIOL 4154	Biology of Global Change Biology	4	BIOL 1543/1541L, lecture and recitation required
BIOL 5843	Conservation Biology	3	BIOL 3863
BIOL 5814	Limnology	4	CHEM 1123/CHEM 1121L or equivalent and 12 hours of biological sciences
BIOL 5933	Global Biogeochemistry: Elemental Cycles and Environmental Change	3	College level chemistry or biochemistry and ecology
CSES 5264	Microbial Ecology	4	BIOL 2013 and BIOL 2011L
CSES 5224	Soil Physics	4	CSES 2203 and MATH 1203
ENDY 5063	Climate Through Time	3	GEOG 4363 or equivalent
ENDY 5113	Global Change	3	Graduate Standing

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ENDY 6013	Environmental Dynamics	3	Graduate Standing
GEOS 5423	Remote Sensing of Natural Resources	3	GEOS 4413 is recommended

Sustainability of Managed Systems courses

Course #	Course Title	Hours	Prerequisites
AGEC 4163	Agricultural and Rural Development	3	AGEC 1103 (or ECON 2023)
AGEC 4413	Economics of Environmental Management	3	AGEC 1103 (or ECON 2023)
AGEC 5133	Agricultural and Environmental Resource Economics	3	3 hours Agricultural Economics or Economics at 3000 level or higher or PhD standing
CSES 4103	Plant Breeding	3	Corequisite: Lab component. Prerequisite: ANSC 3123 or BIOL 2323
CSES 4133	Weed Identification, Morphology, and Ecology	3	Lab component. Prerequisite: CSES 2103 (or HORT 2003)
CSES 4143	Principles of Weed Control	3	Corequisite: Lab component. Prerequisite: CHEM 2613 and CHEM 2611L and CSES 2003
CSES 4224	Soil Fertility	4	Pre- or Corequisite: CHEM 1123/1121L. Corequisite: Lab component. Prerequisite: CSES 2201L and CSES 2203
CSES 5023	Weed Physiology and Herbicide Resistance in Plants	3	Corequisite: Lab component. Prerequisite: CSES 4143 and (BIOL 4304 or CHEM 5813)
CSES 5033	Advanced Soil Fertility and Plant Nutrition	3	BIOL 4304 and CHEM 2613 and CHEM 2611L

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MGMT 4243	Ethics and Corporate Responsibility	3	Graduate Standing
WCOB 510V	Cross Sector Collaboration for Sustainability	3	Graduate Standing

Sustainability of Social Systems courses

Course #	Course Title	Hours	Prerequisites
AGEC 5153	The Economics of Public Policy	3	Graduate Standing
CVEG 4263	Environmental Regulations and Permits	3	Prerequisite: CVEG 3243
ENDY 6033	Society and Environment	3	Graduate Standing
GEOS 4693	Environmental Justice	3	Graduate Standing
HIST 4773	Environmental History	3	Graduate Standing
PLSC 5153	Environmental Politics and Policy	3	Graduate Standing
PLSC 5173	Community Development	3	Graduate Standing
RSOC 4603	Environmental Sociology	3	Graduate Standing
SOCI 5113	Seminar in Social Inequality	3	Graduate Standing

Sustainability of Built Systems courses

Course #	Course Title	Hours	Prerequisites
BENG 5623	Life Cycle Assessment	3	Graduate Standing
CVEG 510V	Civil Engineering for Sustainability	3	To be determined
INEG 4583	Renewable Energy: Green Power Sources	3	Graduate Standing
LARC 5043	Sustainable Housing	3	None

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LARC 5063	Alternative Stormwater Mngmt	3	None
ARCH 4023	Sustainable Design	3	None