PH.D. IN ECOSYSTEM SUSTAINABILITY

Requirements Effective Fall 2023

Code	Title	Credits
Required Core Courses:		
ESS 501	Principles of Ecosystem Sustainability	3
ESS 692	Seminar	1
Areas – Select a minimum of 20 credits from the four Areas indicated below:		**20**
Ecosystem Science		
At least one course must be selected from the following (2-3 credits):		
ESS 524	Foundations for Carbon/Greenhouse Gas Mgmt	
ESS 543/ATS 543	Global Climate Change	
ESS 625/F 625	Ecology of Forest Production	
ESS 660	Biogeochemical Cycling in Ecosystems	
Additional courses may be selected from the following:		
ATS 753	Global Hydrologic Cycle	
ATS 760	Global Carbon Cycle	
BZ 572	Phytoremediation	
BZ 642	Plant Metabolism	
ECOL 505	Foundations of Ecology	
ECOL 600	Community Ecology	
ECOL 620	Applications in Landscape Ecology	
F 510	Ecophysiology of Trees	
F 624	Fire Ecology	
FW 555	Conservation Biology	
HORT 571	Soil-Plant-Water Relations/Water Stress	
RS 531	World Grassland Ecogeography	
RS 630	Ecology of Grasslands and Shrublands	
SOCR 522	Micrometeorology	
SOCR 540	Soil-Plant-Nutrient Relationships	
WR 574	Advanced Snow Hydrology	
WR 616	Hillslope Hydrology and Runoff Processes	
Ecosystem Sustainability		
The following course must be taken (2 credits):		
ESS 542	Greenhouse Gas Policies	
Additional courses may be selected from the following:		
AGRI 500	Advanced Issues in Agriculture	
AGRI 521	Emerging Issues and Challenges for Global Agr	
AGRI 602	Bioenergy Policy, Economics, and Assessment	
AGRI 632	Managing for Ecosystem Sustainability	
AGRI 635	Integrated Forage Management	
AGRI 637	Understanding Policy and Emerging Issues	
AGRI 638	Ecosystem Services on Agricultural Lands	
ANTH 529	Anthropology and Sustainable Development	
ANTH 530	Human-Environment Interactions	
ANEQ 548	Issues in Manure Management	
AREC 542	Applied Advanced Water Resource Economics	
AREC 566/ SOC 566	Contemporary Issues in Developing Countries	
ECOL 592	Interdisciplinary Seminar in Ecology	
GES 542	Biobased Fuels, Energy, and Chemicals	
NR 515	Natural Resources Policy and Biodiversity	
NR 535	Action for Sustainable Behavior	
NR 550	Sustainable Military Lands Management	
PHIL 565	Seminar in Environmental Philosophy	
POLS 670	Politics of Environment and Sustainability	
POLS 709	Environmental Politics in the U.S.	
POLS 729	Political Theory and the Environment	
POLS 739	International Environmental Politics	
POLS 749	Comparative Environmental Politics	
POLS 759	Environmental Policy and Administration	
RS 565	Riparian Ecology and Management	
SOC 564	Environmental Justice	
SOC 666	Globalization and Socioeconomic Restructuring	
SOC 668	Environmental Sociology	
SOC 669	Global Inequality and Change	
WR 510	Watershed Management in Developing Countries	
Quantitative Methods		
At least one course must be selected from the following (4 credits):		
ESS 545	Applications in Greenhouse Gas Inventories	
ESS 565	Niche Models	
ESS 575	Models for Ecological Data	
Additional courses may be selected from the following:		
ANTH 554/ ESS 554	Ecological and Social Agent-based Modeling	
AREC 535/ ECON 535	Applied Econometrics	
AREC 540/ ECON 540	Environmental and Natural Resource Economics	
ECOL 620	Applications in Landscape Ecology	
F 521	Advanced Quantitative Methods in Forestry II	
GEOL 551	Groundwater Modeling	
LAND 520	Geographic Information Systems	
NR 503/GR 503	Remote Sensing and Image Analysis	
NR 505	Concepts in GIS	
NR 512	Spatial Statistical Modeling-Natural Resources	
NR 523/STAT 523	Quantitative Spatial Analysis	
NR 565	Principles of Natural Resources Ecology	
RS 532	Rangeland Ecosystem Sampling	
SOCR 620	Modeling Ecosystem Biogeochemistry	

SOCR 670	Terrestrial Ecosystems Isotope Ecology	
STAA 551	Regression Models and Applications	
STAA 552	Generalized Regression Models	
STAA 553	Experimental Design	
STAA 554	Mixed Models	
STAA 561	Probability with Applications	
STAA 562	Mathematical Statistics with Applications	
STAA 565	Quantitative Reasoning	
STAA 566	Data Visualization Methods	
STAA 567	Computational and Simulation Methods	
STAA 571	Survey Statistics	
STAA 572	Nonparametric Methods	
STAA 573	Analysis of Time Series	
STAA 574	Methods in Multivariate Analysis	
STAA 575	Applied Bayesian Statistics	
STAA 576	Methods in Spatial Statistics	
STAR 511	Design and Data Analysis for Researchers I	
STAR 512	Design and Data Analysis for Researchers II	
STAT 521	Stochastic Processes I	
STAT 525	Analysis of Time Series I	
STAT 540	Data Analysis and Regression	
STAT 544/ ERHS 544	Biostatistical Methods for Quantitative Data	
STAT 547/ CIVE 547	Statistics for Environmental Monitoring	
STAT 560	Applied Multivariate Analysis	
STAT 570	Nonparametric Statistics	
STAT 600	Statistical Computing	
STAT 605	Theory of Sampling Techniques	
STAT 640	Design and Linear Modeling I	
STAT 645	Categorical Data Analysis and GLIM	
STAT 650	Design and Linear Modeling II	
WR 524/CIVE 524	Modeling Watershed Hydrology	
WR 575	Snow Hydrology Field Methods	
WR 674	Data Issues in Hydrology	
Communication/Collaboration		
At least one course must be selected from the following (1-3 credits):		
ECOL 693	Research Seminar	
JTC 614	Public Communication Campaigns	
JTC 660	Communication and Innovation	
JTC 661	Information Design	
JTC 662	Communicating Science and Technology	
NR 501	Leadership and Public Communications	
Research and Dissertation (minimum credits required):		
ESS 798	Research	3
ESS 799	Dissertation	3
Additional credits required to complete this degree may include:		**42**
Master's Degree Credit (a maximum of 30 credits may be accepted from a master's degree)		
Additional courses not taken previously from the Areas listed above		
Additional credits completed under ESS 798 or ESS 799 beyond the minimum credits required above		
Program Total Credits:		**72**

A minimum of 72 credits are required to complete this program.