

# Natural Resources and Environmental Sciences (NRES)

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## Courses

### ***NRES 5101 Seminar: 1 semester hour.***

Two presentations to be made during the semester; the first presentation will be at the beginning of the semester stating the proposal for master's thesis/ internship and second will be at the end of the semester to state accomplishment.

### ***NRES 5202 Advanced Research Methods in NRES: 2 semester hours.***

Literature review, understand the research methods, learn to write proposals, data collection (including in-situ), data analysis and methods, presenting results, learn to present (oral and poster) through a project work, writing report.

### ***NRES 5303 Research Statistics in NRES: 3 semester hours.***

Analysis of variance, regression, multivariate analysis, multivariate data, visualization, principal components analysis, multidimensional scaling, factor analysis, cluster analysis, confirmatory factor analysis and structural equation models by statistical computer packages.

Prerequisites: MGMT 3301 or MGMT 3013.

### ***NRES 5305 Advanced GIS and RS for Environmental Management: 3 semester hours.***

Advanced GIS and RS components for natural resources and environmental management such as landscape and water resources management. It covers to create, store, manage, query, present and view spatial and non-spatial natural resources and environmental datasets. It includes how accurately and precisely natural resources can be mapped and measured from satellite remote sensing using remote sensing GIS and RS tools. It also includes collecting satellite image, spatial data, to learn its application in industries such as emergency response, meteorology, water resources, land use, agriculture, forest, and urban planning.

Prerequisites: GEOG 2311 or GEOG 2113.

### ***NRES 5310 Economic Analysis of Natural Resource Management: 3 semester hours.***

This course focuses on developing an understanding of an economic framework (economic concepts, tools, and techniques) for assessing natural resource management projects, application of the framework to the management of various natural resources.

### ***NRES 5311 Human Dimensions of Natural Resource Management: 3 semester hours.***

Human - environment interactions; environmental justice; human values, beliefs, and attitudes regarding the environment; communication and behavior change strategies; landscape perception and attitudes; resource-dependent communities; public involvement; conflict management; and future issues.

### ***NRES 5312 Resources and Environmental Policy: 3 semester hours.***

This course focuses on exploration of institutional and policy dimensions of natural resource development, management, allocation, markets and pricing, focusing on their environmental impacts. Emphasis on policy analysis using case studies and empirical findings.

### ***NRES 5322 Environmental Hydrology: 3 semester hours.***

Hydrologic cycle, water resources, and society; hydrologic processes; hydrological effects of climatic change; stream processes; open channel flow, hydraulic control structures; soil conservation and sediment budgets; hydrology of forests and wetlands; hydrogeology; human impacts on water resources; fundamentals of remote sensing and GIS for hydrologic application; practical exercises on conducting and reporting hydrologic studies.

Prerequisites: AGRO 4362.

### ***NRES 5323 Hydrologic Processes in Soils: 3 semester hours.***

An overview of the basics of soil physical properties, hydrologic processes in soil including water flow, solute movement, and gaseous transport in the variably saturated (saturated/unsaturated) zones, analyze and estimate soil hydraulic properties using public domain packages (RETC and Rosetta), practical and theoretical exercises using HYDRUS-1D.

Prerequisites: AGRO 3364.

### ***NRES 5324 Advanced Watershed Management: 3 semester hours.***

Hydrologic cycle, watershed characteristics, precipitation and interception, evapotranspiration, soil water storage, infiltration, runoff process, soil properties, hydrologic methods, wetlands hydrology and management, riparian area management, erosion, tropical watershed management, socioeconomic considerations in watershed management, water quality, and watershed planning and protection. Hand on experience in data handling, presentation, and analysis. Gain experience in critiquing research work and publications.

Prerequisites: NRES 5323.

### ***NRES 5325 Advanced Groundwater Hydrology: 3 semester hours.***

Overview of groundwater flow and analytical water flow solutions; theory and practice of groundwater modeling; basic concepts and governing equations of fluid flow in porous media; computational algorithms of solving the equations; model construction, simulation, and calibration using state-of-the-art modeling tools; theory of solute transport and modeling; modeling report, archive, and review; beyond basic modeling concepts.

Prerequisites: NRES 5323.

***NRES 6600 Thesis: 6 semester hours.***

Independent research work on a specific area in Natural Resources Environmental Sciences under the supervision of a thesis advisor. All course work toward the degree must be completed.

Prerequisites: NRES 5324 and NRES 5325.