

**Effective Date 2020-2021**

Agricultural and Environmental Systems – Natural Resources and Environmental Systems, MS

College of Agriculture & Environmental Sciences

**Graduate Coordinator:** Dr. Louis E. Jackai, **Email:** [lejackai@ncat.edu](mailto:lejackai@ncat.edu); Phone: 336-285-4837

**Department Chair:** Dr. Gregory D. Goins, **Email:** [gdgoins@ncat.edu](mailto:gdgoins@ncat.edu) Phone: 336-285-2191

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The **Master of Science in Agricultural and Environmental Systems** within the Natural Resources and Environmental Systems concentration provides a solid foundation in the fundamental biological and biochemical sciences related to natural and renewable resources, bioprocessing, food systems sustainability including the underlying principles of horticulture, agro-ecology, environmental remediation and protection, plant and soil health, mushroom science and biotechnology. Thesis research or project research is a degree requirement in one of these knowledge areas under the direction of a graduate faculty member. Graduates are expected to be analytical in their thinking and applied in their focus.

**Additional Admission Requirements:**

- Students must have good background in basic sciences (Biology, Chemistry and Physics).
- A GRE score – recommended but not required.

**Program Outcomes:**

- The production of advanced agricultural scholars that obtain professional and leadership roles with agricultural and environmental related entities. Additional outcomes include individuals that pursue doctoral studies and the valuable scholarly works produced by graduates of the program, through thesis and capstone project endeavors.

Degree Requirements

**Total credit hours: 30**

**Core Courses:**

- **Required hours (9): AGRI 604/ABM 705, AGRI 700, AGRI 780**

**Thesis Option**

Thesis Course:

- **NARS 797 – 6 hours**

Concentration Area Electives:

- **Concentration Area Elective Courses - 15 hours**

**Non-Thesis, Project Option**

Non Thesis Project Course:

- **NARS 796 -3 hours**

Concentration Area Electives:

- **Concentration Area Elective Courses - 18 hours**

**Natural Resources and Environmental Systems Concentration Course selections:**

AGRI-604: Experimental Methods in Research  
EASC-610: Sustainable Earth Credit  
EASC-620: Environmental Studies I  
EASC-621: Environmental Studies II  
HORT 600: Advanced Techniques for Horticultural Crop Improvement  
HORT 602: Grapes and Small Fruits  
HORT-610: Commercial Greenhouse Production  
HORT 620: Vegetable Production Credit  
NARS 600: Mycology and Fungal Biotechnology  
NARS 601: Plant Pathology & Modern Approaches to Plant Disease Control  
NARS 703: Principles of Entomology and Pest Management  
NARS 604: Crop Ecology  
NARS 605: Breeding of Crop Plants  
NARS 608: Special Problems in Natural Resources  
NARS 610: Applied Spatial Statistics and GIS  
NARS 618: Fundamentals of Agroforestry  
NARS 685: Special Topics  
NARS 700: Plant Pathology  
SLSC 621: Soil Microbiology  
SLSC 632: Soil Physics  
SLSC 633: Soil Genesis, Classification and Land Use  
SLSC 634: Soil Environmental Chemistry  
SLSC 640: Wetland Management  
HORT 700: Plant Biotechniques  
AGEN 701: Soil and Water Engineering II  
SLSC 710: Soils of North Carolina  
AGEN 714: Applied Hydrogeology  
SLSC 715: Soil Mineralogy  
SLSC 717: Methodology in Soil, Plant and Water Analysis  
EASC 718: Applied Environmental Microbiology  
NARS 789: Graduate Seminar in Natural Resources  
NARS 777: Special Problems  
SLSC 727: Soil Fertility and Plant Nutrition  
SLSC 734: Applied Environmental Chemistry

## Directory of Graduate Faculty

- Aryal, Niroj, PhD., Kansas State University; Assistant Professor, Environmental engineering, water use modeling, conservation and hydrology.
- Bhowmik, Arnab, PhD, North Dakota State University; Assistant Professor, Soil science and soil microbiology, sustainable cropping systems.
- Dingha, Beatrice N., PhD, Auburn University; Research Associate Professor, Urban and storage systems entomology, food safety, Integrated Pest Management.
- Gayle, Godfrey A., PhD, North Carolina State University; Professor, Water resources engineering. Emeritus
- Isikhuemhen, Omoanghe S., Institute of Microbiology, Prague; Research Professor, Mycology, mushroom biology & biotechnology.
- Jackai, Louis E.N., PhD, University of Illinois at Urbana-Champaign; Professor & Graduate Program Coordinator, Nutritional and applied insect ecology, vegetable crop entomology, Integrated Pest Management.
- Randle, William M., PhD., University of Minnesota; Professor, Plant breeding, genetics, nutrient management of crop plants.
- Shahbazi, Abolghasem, PhD, Pennsylvania State University; Professor, Bioprocess engineering and waste recycling, Agricultural and Biological Engineering.
- Uzochukwu, Godfrey A., PhD, University of Nebraska-Lincoln; Professor, Soil mineralogy, land use and classification, earth science.
- Wang, Lijun, PhD, National University of Ireland; Professor, Bioprocess engineering; bioenergy and modeling.
- Yang, Guochen, PhD, University of Nebraska-Lincoln; Research Professor, Tissue culture, micro-propagation, plant growth regulation.