Building Programs of Study in Agriculture and Life Sciences that are Responsive to Students, Employers and Society

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North Carolina - The Tar Heel State

Raleigh
North Carolina State University

- Located in Raleigh
- 10 colleges
- Bachelor’s degrees in 113 fields
- Master’s in 163 fields
- PhDs in 61 fields
- Doctor of Veterinary Medicine
North Carolina State University

Colleges

- Agriculture and Life Sciences
- Design
- Education
- Engineering
- Humanities and Social Sciences
- Management
- Natural Resources
- Physical and Mathematical Sciences
- Textiles
- Veterinary Medicine

College of Agriculture and Life Sciences

- 20 Academic Departments
- Traditional Agriculture
  - Animal Science
  - Horticulture
  - Ag Business
- Life Sciences
  - Biology
  - Biochemistry
  - Genetics
- Teaching, Research, Extension
Topics for Consideration

• Agriculture curriculum must address current and future issues
• The study of agriculture requires a systems approach
• Students must obtain critical thinking, collaborative learning, and communication skills
• Elements of a successful program of study in agriculture
Agriculture Curriculum Must Address Current and Future Issues

• Increased pressure on the global food supply
• Shift from fossil fuels to a bio-economy
• Global climate change – relationship with food production, human health and animal health
• Conservation of natural resources
The Study of Agriculture Requires a Systems Approach

- **Natural Sciences**
  - Biology
  - Chemistry
  - Physics
  - Mathematics
  - Logic
  - Statistics

- **Social Sciences**
  - Economics
  - Sociology

- **Agricultural Sciences**
  - Animal Science
  - Plant Science
  - Soil Science
  - Food Science
  - Ag Economics
Students Must Obtain Critical Thinking, Collaborative Learning, and Communication Skills

- Critical thinking skills
  - Laboratories
  - Case studies
  - Undergraduate research
  - Internships
  - International experiences
  - Service learning
  - Capstone projects

- Life Skills
  - Communication
  - Interpersonal
  - Work ethic
  - Collaborative
  - Honest, with high integrity
Elements of a Successful Program of Study in Agriculture

• Scientific and technical competency
• Nimble
• Responsive to agriculture business & industry
• Includes:
  – Program objectives
  – Student learning outcomes
  – Direct assessment of program objectives and student learning outcomes
Elements of a Successful Program of Study in Agriculture

• Scientific and technical competency

• Nimble
  – Emergence of new areas of study (Biomaterials, Agroecology, Bioinformatics/Agroinformatics, Genomics, etc.)
  – Rapid changes in traditional disciplinary subjects
  – Global perspective
Elements of a Successful Program of Study in Agriculture

- Scientific and technical competency
- Nimble

- Responsive to agriculture business & industry
  - Solve problems (higher order thinking skills)
  - Communication and interpersonal skills
  - Work in teams (collaborative)
  - Technical competence
Elements of a Successful Program of Study in Agriculture

• Scientific and technical competency
• Nimble
• Responsive to agriculture business & industry

• Includes:
  – Program objectives
  – Student learning outcomes
    • Relevant to higher education and agriculture business & industry
• Program Objectives
  o Develop technical knowledge
  o Comprehend local, national, and international issues and problems
  o Apply critical thinking, existing technology & practical approaches to solve problems
  o Work in teams
  o Communicate effectively
  o Appreciate the need for life-long education

• Learning Outcomes
  o Identify & synthesize knowledge in discipline to solve technical problems
  o Address agricultural issues from a technical viewpoint
  o Define, analyze and apply viable solutions to technical problems
  o Work effectively in teams
  o Prepare effective written materials
  o Deliver effective oral presentations
  o Gather appropriate information from on-line and vocational resources
Elements of a Successful Program of Study in Agriculture

- Scientific and technical competency
- Nimble
- Responsive to agriculture business & industry
- Includes:
  - Program objectives
  - Student learning outcomes
  - Direct assessment of program objectives and student learning outcomes
    - Review curriculum and course content
    - Academic performance of students
    - Student placement
    - Employer satisfaction
    - Alumni success
Reference Material

Transforming Agricultural Education for a Changing World

A NEW BIOLOGY FOR THE 21st CENTURY

BIO 2010: Transforming Undergraduate Education for Future Research Biologists

Understanding Agriculture: New Directions for Education

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