
LEARNER OUTCOMES FOR THE UNDERGRADUATE CURRICULUM

Department of Agronomy

The general goal of the agronomy curriculum is to provide students a unique education that is liberal in breadth, science-based, effective in personal skills development, and that will prepare them for entry-level positions in government, agri-business, farm management, graduate study, and for other positions where a problem-solving approach to issues in crops, soils and the environment is needed. This agronomy curriculum will provide graduates with the education and training necessary for them to become effective professionals and leaders in agriculture, their community, and their country. Students will accrue knowledge, grow in wisdom, and hone their skills relative to:

1. **TECHNICAL KNOWLEDGE.** The curriculum will provide graduates with the theoretical and practical scientific knowledge needed for continued efficient and sustainable production of food, feed and fiber, as well as the information and subject-matter mastery required for exercise of wise judgment in dealing with complex issues in resource management and conservation. Business education is essential to effectiveness of the otherwise competent professional agronomist. And, it must be instilled that education is a life-long pursuit.

Student Expectations:

- Understand the scope of agronomy and its relationships to other disciplines and professions.
- Develop a basic understanding of plant, soil, water and climate principles.
- Understand basic technical principles and methods relating to production of important crops: conservation tillage methods and seedbed preparation; population densities and plant spacings; cultivar and hybrid selection in relation to soil type and climate; seeding times and methods; cropping/rotation systems; cultivation practices; efficient and environmentally sound fertilization and weed control strategies; harvesting, storage, and marketing methods and strategies.
- Understand basic strategies for efficient and abundant production, harvest, and storage of high-quality forage and pasture crops, including pasture management for sustained production.
- Be able to recognize common biotic stresses, their potential effects on plants at various stages of crop development, and options for amelioration of stresses with minimal disturbance to the environment. Understand the concepts of weed threshold populations and economic injury levels for insects, nematodes and diseases.

- Understand the soil as a resource upon which ecosystems, agriculture, and other land uses depend.
 - Understand, in historical and modern perspective, the basic principles important to sustained production and land use.
 - Understand the effects of the abiotic environment on crops and soils—water, atmospheric pollutants, heat and cold—and methods that ameliorate such stresses.
 - Be able to quantify amounts, rates, and relationships using measurements basic to agronomy, such as yield per unit area, harvest index, cation exchange capacity, parts per million, bulk density, relative humidity, etc. Understand and make use of the metric system of weights and measures.
 - Be able to meet the minimum competencies established by the certified soil scientist or certified crop adviser programs.
2. **PROFESSIONAL SKILLS.** Students will develop the human and technical skills needed to function in the forefront of an increasingly complex and competitive society: oral and written communication, computer and leadership skills, and the critical, integrative thinking capacity that undergirds competent problem solving and decision making. Skills development will be integrated into agronomy content courses.

Student Expectations:

Communications

- Be able to present an effective oral report.
- Be able to answer oral questions extemporaneously and understandably.
- Be able to write a concise, grammatically correct report.
- Be able to debate issues in a professional manner.
- Be able to effectively communicate using electronic media.

Leadership

- Possess the management skills necessary to motivate and organize a group in defining and solving a problem.
- Be able to work effectively in a team situation either as leader or participant.
- Possess and demonstrate high standards of achievement.

Computer

- Utilize computer tools, such as spreadsheets, databases, geographical information systems, word processors, and presentation software, to organize, manage, interpret, and communicate data.
- Be able to interpret temporal and spatial data.
- Be competent in electronic communications, including accessing and use of electronic mail, databases, electronic bulletin boards, etc.

Problem solving

- Given a situation, be able to define the problem, identify the resources needed to solve it and their repositories, and propose and evaluate different solutions based on the resources of the client.
- Possess the capability to assess and evaluate the credibility and biases of different sources of information.
- Be able to analyze and interpret simple research data with an understanding of basic statistical principles such as the mean, SE, F ratio, LSD, and significance levels. Calculate and interpret a simple ANOVA, linear regression, and correlation.

Professional

- Have a holistic perspective of the agroecosystem.
 - Understand basic business concepts such as interpretation of a financial statement, calculation of a profit or loss and return on investment, and construction of an enterprise budget.
 - Be able to use libraries, electronic repositories of information, and other information sources in support of further personal and professional growth.
 - Be able to perform mathematical calculations appropriate to the profession, and interpret graphical and tabular information.
 - Understand and use terminology appropriate to the field of expertise.
 - Understand the structure and processes of governments as they influence agricultural policy.
 - Be able to interpret laws and regulations as they relate to agriculture and the environment.
 - Be committed to effective time management.
3. **PERSPECTIVE.** The graduate should have a holistic perspective of agriculture: an appreciation of agriculture as a highly sophisticated, integrated system for food production and distribution that operates within a political environment and on a global scale. He/she must be able to visualize what makes the whole work, and understand the responsibilities of the agronomist within the system with respect to production of an abundant, safe, and nutritious food supply within the context of wise management of natural resources.

Student Expectations:

- Possess an awareness of the global extent of agriculture and of crop, soil and climate diversity in the world.
- Recognize the interdependence of economies, cultures, and politics at all scales from local to international.
- Understand agronomic practices of other parts of the world in their political, cultural, and economic contexts.

4. **ETHICS/VALUES.** The curriculum should lead students in development of an appreciation of ethical resource management responsibilities in regional, national and world social and economic contexts. It must instill an awareness for sustainable management of energy, soil, water, wildlife and other natural resources. Agronomy courses should provide opportunities for ethical debate and value judgment that expand one's tolerance and appreciation for the complexities of societal issues. The agronomy curriculum will foster development of a personal, and a professional code of ethics.

Student Expectations:

- Be able to deal with moral, ethical, and legal conflicts: Recognize a conflict of interest situation involving oneself and one's client or employer; differentiate between the public good and a personal goal.
 - Appreciate the responsibility of the individual to society in sustainable management of soil, plant, water, energy, and wildlife resources.
 - Adopt a professional ethics code, such as the ARCPACS Code of Ethics.
5. **DIVERSITY.** For society to function effectively and justly for each person, graduates must appreciate the richness that our diverse backgrounds and philosophies bring to the whole. Understanding of and appreciation for the political, cultural, and religious opinions and practices of others is the hallmark of an educated person.

Student Expectations:

- Appreciate that our cultural diversity adds richness to our lives.
 - Value the humanities, arts, and recreation as meaningful activities that enrich our culture.
 - Acknowledge differences in political, cultural, religious, and ethnic beliefs and practices.
 - Apply fundamental concepts of economics and the social sciences to human interaction and organization. Have an appreciation of the family as an interdependent, supportive unit.
-