

Assessment of Student Learning in the Agronomy-Ag Mechanics Division 2015 – 2016 Academic Year

Part 1 – Agronomy and Diversified Agriculture Program Learning Outcome Assessment

Students majoring in Agronomy or Diversified Agriculture are expected to meet the following learning outcomes upon completion of their degrees.

1. Students will be able to effectively communicate in oral and written form.
2. Students will be able to gather, assimilate, and process information to reach sound logical conclusions in their chosen career pathway.
3. Students will be able to apply economic principles of accounting, marketing and budgeting to agronomy enterprises.
4. Students will be able to exhibit required knowledge and skills consistent with their chosen field of study. (Technical Competence)
5. Learning outcome specific for the Agronomy Industry Management Option.
 - a. Students will be able to apply economically sound and environmentally sustainable agricultural crop production practices in the Great Plains.
6. Learning outcome specific for the Diversified Agriculture Option.
 - a. Students will be knowledgeable in the areas of modern livestock husbandry and management practices.
 - b. Students will be able to apply economically sound and environmentally sustainable agricultural crop production practices in the Great Plains.

Assessment of Agronomy and Diversified Agriculture program outcomes includes the following tools.

1. Course Competency
 - a. Technical knowledge is directly measured in several key courses.
2. Capstone Project
 - a. Students interested in having their own farm or diversified operation take the AGR 2943 Capstone course in which a farm/ranch business plan is developed. These business plans are assessed using a rubric based on program learning outcomes.
3. Internship Employer Surveys
 - a. The results from these surveys provide feedback on outcome number 4 (technical knowledge and skills) from the employer perspective.

Course Competency Summary for Assessing Agronomy and Diversified Ag Program Outcomes

Course competency is an important tool for assessing student learning in the following two program outcomes.

1. Students will be able to exhibit required knowledge and skills consistent with their chosen field of study. (Technical Competence)
2. Learning outcome specific for the Agronomy Industry Management Option.
 - a. Students will be able to apply economically sound and environmentally sustainable agricultural crop production practices in the Great Plains.

	AGR 1203 Principles of Soils	AGR 2303 Soil Fertility	AGR 2354 Pest Mgmt.	AGR 2383 Irrigation Mgmt.	AGR 2404 Crop Mgmt.	AEQ 2323 Precision Farming
# of Students	26	11	9	12	8	19
% of course outcomes met	93%	78%	98%	96%	100%	90%

Overall, students are meeting the outcomes in these courses that provide the essential knowledge and skill training in Agronomy. The most notable exception was observed in the Soil Fertility course. This was the first year that students took the course their 2nd semester rather than the 3rd semester. Part of the deficiency was due to poor attendance from several students and failure to complete homework. More emphasis on laboratory activities to illustrate knowledge and problem solving concepts will be provided. If deficiency occurs again next year, consideration will be given to moving the course to the students 4th semester.

New precision farming software and planting equipment was added during the spring semester of 2016. The planting equipment was not fully functional, thus not available for instruction. Computer software learning exercises was added to examine and generate precision farming maps. The instructor of this course (Brad Ramsdale) will be attending a training conference from Ag Leader during summer 2016 in order to become more knowledgeable on teaching with the software. Next year will provide a better assessment of software/equipment upgrades on student learning in precision farming.

Capstone Project Assessment Summary for Agronomy and Diversified Agriculture Majors

Rubric Assessment Scale: 1 = Unsatisfactory, 2 = Needs growth, 3 = Satisfactory, 4 = Outstanding

	2011 to 2015 Average	2016
Number of Projects Evaluated*	8.2	3
Program Outcome		
1) Written Communication	3.0	3.5
2) Gather and assimilate information	3.1	3.5
3) Analyze, interpret and apply information	2.9	3.5
4) Apply economic principles to ag enterprises	2.9	3.5
5) Humane livestock management	2.4	--
6) Livestock waste and facility management	2.7	--
7) Livestock husbandry practices	2.9	--
8) Cultural practices are sustainable	3.2	3.8
9) Pest management practices are sustainable	3.0	3.8
10) Soil management practices are sustainable	2.9	3.8
11) Water management practices are sustainable	3.1	3.8

* Projects were either crop production only, livestock management only, or diversified; thus not every project was used for outcomes 5 to 11.

Discussion

The capstone projects are most effective in assessing the program outcomes 1 to 4 in the table above. Capstone projects assessed in 2016 were from three agronomy students. The projects were very strong in all aspects and were considered the best efforts by the instructor compared to all other students with different majors in the course. The changes in the Diversified Agriculture curriculum that were made last year will be reflected in next year's capstone projects by these majors and will be assessed thoroughly at that time.

Use of Results to Improve Student Learning

Capstone project assessment does not indicate any major changes are necessary in writing/communication or business management education.

Internship Employer Survey Results for Agronomy and Diversified Agriculture Majors

Scale: 5 = excellent, 4 = Above average, 3 = Average, 2 = Below Average, 1 = Very Poor

	Average 2011 to 2014	2015	
		Agronomy	Diversified Ag
Appearance	4.38	4.5	4.25
Dependability/Supervision	4.34	5	4.5
Cooperation/Attititude	4.22	4	4.25
Respect/Personality	4.33	4.5	4.25
Communication	3.74	4.5	4.25
Attendance/Punctuality	4.52	5	4.5
Quality of Work/Safety	4.32	5	3.75
Supervisory Ability/Leadership	3.81	4.5	3.25
Technical Knowledge	4.12	5	4.5
Overall Employability Rating	4.32	4.5	4.5
Total	4.21	4.55	4.2
Number of Students Evaluated	48	2	4

* Appendix 2 illustrates the full employer survey.

Discussion

Employer ratings for student interns continue to be very strong and do not raise any concerns regarding our educational programs. Overall employability of our students is rated at above average to excellent. Supervisory ability and leadership is generally the lowest rating, which would be expected for a student intern that is only 1 year into their college education. Communication skills have also been consistently lower than the other categories. Employer written comments suggest this is not due to ability, but rather the lack of communication. Returns of employer surveys were low this year, thus providing a limited data set.

Use of Results to Improve Student Learning

Since our programs are career driven, employer feedback is an important part of evaluating our students. The vast majority of employers acknowledge that they would hire the student permanently if

available. However, it has become apparent that our students need improvement on communicating with employers and fellow employees. This same observation is frequently made by faculty regarding student’s communication with instructors. Efforts will be made in all classes to relate instructor-student communication to necessary career based communication. Specific exercises will be developed within core courses required in the agronomy and diversified options.

Part 2 – Irrigation Technician Certificate

Program Student Learning Outcomes

- Students will gain a foundational knowledge in electricity and mechanized irrigation systems in order to effectively and safely service, repair, troubleshoot, and install center-pivot systems.
- Students will be able to interact professionally with colleagues and clients.

Assessment of Irrigation Technician Certificate

1. Course Competency
 - a. Technical knowledge is directly measured in several key courses.
2. Post-graduation surveys
 - a. Technical knowledge
 - b. Professionalism

Course Competency Summary

	AEQ 2801 Reinke Certification	AEQ 1501 Intro to Electric Code	AEQ 1503 DC Circuits	AEQ 1513 AC Circuits	AEQ 1172 Industrial Safety	AEQ 2404 Mechanized Irrigation
# of Students	7	7	11	9	6	6
% of course outcomes met	100%	86%	81%	89%	100%	100%

Discussion and Changes to Improve Student Learning

A new Ag Mechanics instructor was hired and is now teaching all of these courses. Previously, an adjunct from the irrigation industry taught Intro to Electric Code, AC Circuits, and Mechanized Irrigation. Lack of hand’s-on learning experiences was noted the previous year for these courses. The new instructor greatly increases the hand’s-on laboratory component for all of the courses and student success was noted. The partnership with Reinke also led to a new course, Reinke Certification, in which students completed online video training with built-in assessment standards from Reinke. Additionally, a mini-pivot was added to the irrigation laboratory and students had the opportunity to assemble it during class. The one challenge noted for these courses was further education/training is needed for the new instructor to increase his knowledge of center-pivots. The instructor is continuing interactions with Reinke to provide better laboratory training for the students.

Post-graduation surveys

This was the second year of the program, thus surveys are not yet available for assessment.

Other Program Changes/Discussion

1. Discussions with the industry advisory members from Reinke irrigation has led to additional support for the program.
 - a. A new course was added titled AEQ 2801 Reinke Certification in which students will complete the on-line video based training from Reinke on servicing center-pivots.
 - b. A mini-pivot system was added to the irrigation technician laboratory.

Part 3 – Assessment Driven Changes in Agronomy-Ag Mechanics

New Programs

Two new certificate programs were approved by the Nebraska Coordinating Commission for Post-Secondary Education in December 2015: Certificate in Agricultural Chemical Application and a Certificate in Agricultural Welding. Both of these certificates were develop based on previous year's advisement from industry advisory councils. These will be available for students beginning fall 2016.

Agricultural Chemical Application Certificate

- Students will be able to mix and apply agricultural chemicals safely and efficiently.
- Students will be able to interact professionally with colleagues and clients.

Required Courses	Credit Hours
AEQ 2301 Pesticide Certification	1
AGR 2201 Commercial Ag Carrier	1
AGR 2354 Pest Management	4
AEQ 2103 Ag Chemical Applicator	3
AEQ 2323 Precision Farming	3
AEQ 2303 Equip. Preventative Main.	3
AEQ 1153 Equipment Principles	3

Total Credit Hours 18

Agricultural Welding Certificate

- Students will be able to perform welding and fabrication technical skills. Specifically, students will demonstrate:
- Students will be able to interact professionally with colleagues and clients.

Required Courses	Credit Hours
AEQ 1172 Industrial Safety	2
AEQ 1203 Welding	3
AEQ 1303 Intermediate Welding	3
AEQ 2214 Advanced Welding	4
AEQ 2604 Welding Apprenticeship	4
TOTAL	16

New Partnerships

An agreement was signed with York High School to provide their students the opportunity to pursue certificates in Diversified Agriculture, Agricultural Chemical Application, and Irrigation Technician. Central Valley Ag Coop and Reinke Co. were also included in the agreement to provide laboratory based

experiences for the students. The Agricultural Chemical Application Certificate is currently being offered in its entirety with the first student completers to occur in May 2017. Logistics are still being worked out with Reinke in order to offer the Irrigation Technician Certificate and current plans are targeting a Fall 2017 start.

The Diversified Agriculture Certificate was also presented in agreements to Cambridge, Elm Creek, and Cozad High Schools. Students at these schools are primarily just taking dual credit courses rather than pursuing a certificate. The Higher Learning Commission has approved NCTA to offer one online/dual credit program (July 2016), which will be the Agricultural Chemical Application Certificate. A new Certificate in Agriculture (16 credit hours) is being developed to replace the Diversified Agriculture Certificate (30 credit hours) model. Nebraska Coordinating Commission approval is expected by December 2017 and a request will be made to the Higher Learning Commission to allow other online/dual credit programs later in 2017.

Curriculum Revisions

Discussions with the new Agribusiness Management Systems division chair have led to the development of a new course, ECN 1103 Introduction to Agricultural Economics. This new course will replace the Microeconomics course requirement for all Agronomy, Diversified Ag, and Ag Equipment degree options (Associate of Applied Science degrees). The change was a result of the divisions assessment of student success in Microeconomics.