Agricultural Systems Management, BS

Program Description

Graduates of the Agricultural Systems Management Undergraduate Program manage people, money, and machines in the food and agricultural industries. They are typically employed as production or processing operations managers, equipment managers, or in technical sales and services. Employers include farm and industrial equipment companies, food processing plants, cotton gins, grain and seed companies, livestock feeding operations, irrigation companies, construction companies, manufacturers, and a variety of other employers who need technical managers. In these positions, our graduates need the skills to integrate technical knowledge, business/financial expertise, and communication abilities. The mission of the Agricultural Systems Management curriculum is to provide an educational experience that prepares our graduates for a productive career in management and operation of the highly technical systems used in the modern food and agriculture industry. Specific objectives of the curriculum are the following: Broad knowledge of the technical aspects of the agricultural and food industries; Working knowledge of business, accounting, and management practices; Ability to apply a wide range of computer and information technologies to business management; and A high level of written and oral communication skills.

Outcome 1 – Economic Analysis

AGSM graduates will perform economic analyses on technical systems. Two measures will be used for assessment: (1) Specific course assignment outcomes; (2) Student self-assessment upon graduation.

Measure 1.1 – Capstone Economic Analysis Report

Data Collection: A major task performed in the AGSM Capstone Course is Economic/Financial Analysis. This task is performed by seniors after completing multiple Financial Management courses in the curriculum which have been completed prior to the Capstone Course. Performance on Capstone Economic/Financial Analysis will be evaluated by two AGSM faculty members as a part of the capstone course assignment.

Methodology or data analysis strategy: After students complete the Economic Analysis assignment for their Capstone project, the instructors will assess student performance in this area. Results are rated according to the following aggregate scores on the Economic Analysis Report, which includes not only the correct performance of cash flow series, payback period, IRR, and other measures, but their ability to communicate these tools using tabular data display and text description. This holistic evaluation was mandated by the AGSM Curriculum Committee.

1. Very Successful 90-100
2. Successful 80-89
3. Acceptable 70-79
4. Marginal 60-69
5. Unacceptable <60

[See Homework 4 Economic Analysis and Recommended Solution Rubric under *Supporting Documentation*.]

Target 1.1

AGSM Curriculum Committee determined that 90% of artifacts will be rated successful or very successful on financial analysis skills according to the rubric within the attached document. Results are rated according to the following aggregate scores on the Economic Analysis Report, which includes not only the correct performance of cash flow series, payback period, IRR, and other measures, but their ability to communicate these tools using tabular data display and text description. This holistic evaluation was mandated by the AGSM Curriculum Committee.

1. Very Successful 90-100
2. Successful 80-89
3. Acceptable 70-79
4. Marginal 60-69
5. Unacceptable <60

Finding 1.1: **Met**

In the Spring 2023 AGSM 440 course, 9 of 9(100%) of the artifacts were evaluated by two faculty members as acceptable (2), successful (3), or very successful (4) in the assessment of their financial analysis skills project report. The aggregate score was 87.2, which is in the category of "Successful." The students provided economic analysis of their recommended solution to industry clients who posed the problem assigned to the team.

The 2023 assessment of 87.2 was down from an equivalent 94.2 the previous year. However, the 94.2 was actually 942 on a 1000-point scale; a scale which the committee has determined led to inflation of assessment scoring. Recalibrating to a 100-point assessment scale has resulted in a more meaningful assessment of student performance in this area. Regardless, the students have met the target set by the AGSM committee and appear to be competent in their economic analysis of problems in industry.

Measure 1.2 – Exit Interviews of Graduating Seniors

Data Collection: Graduating Seniors will complete the self-assessment just prior to graduation, regarding their opinions of their abilities. Response options, assigned scores of 5 to 1, respectively, were Very Well, Adequately, Uncertain, Inadequately, and Poorly.

Methodology or data analysis strategy: This is a self-assessment and will be compared to the instructor assessment presented earlier to determine level of consistency between measures.

[See Senior Survey under *Supporting Documentation*.]

Target 1.2

The AGSM Curriculum Committee determined that students would self-assess as an average of 3.75 or higher prepared in related questions (perform financial analyses on existing and potential technical systems) using a Likert scale of 1-5.

Finding 1.2: **Met**

In April 2023, 35 AGSM seniors assessed their abilities their abilities to perform financial analyses on technical systems. The aggregate score was 4.45.

The previous year self-rating was 4.26. The 2023 score of 4.45 is significantly higher as determined by the AGSM Curriculum Committee. The implication is that students continue to feel very confident in their ability to perform financial analysis at the culmination of their curriculum.

Outcome 2 – Project Management

AGSM graduates will demonstrate superior ability to assemble, implement, and manage technical systems. Two measures will be used for assessment: (1) Specific course assignment outcomes; (2) Student self-assessment upon graduation.

Measure 2.1 – Capstone Risk Analysis and Implementation Plan

Data Collection: Students will demonstrate mastery of project management skills by their ability to construct and communicate a risk analysis and an implementation plan of their recommended solution to a client's problem in the course. The score of their performance is indicative of their ability to adequately use project management tools and techniques in accordance with the AGSM Curriculum and Capstone Syllabus.

Results will be rated according to the following aggregate scores:

1. Very Successful 90-100
2. Successful 80-89
3. Acceptable 70-79
4. Marginal 60-69
5. Unacceptable <60

Methodology or data analysis strategy: Analysis will focus on the **risk analysis** and **implementation plan** portion of the description and rubric in the attached assignment:

-Identification and prioritization of risks associated with the implementation of the recommended solution, mitigation of risks with quantifiable measures to reduce the impact of the risk.

-Narrative of sequential processes, Gantt chart, project network diagram, with critical path analysis and critical path time

[See Homework 6 Risk and Implementation Plan Rubric under *Supporting Documentation*.]

Target 2.1

Target: AGSM Curriculum Committee determined that 80% of artifacts will be rated successful or very successful on **implementation plan** according to the attached rubric.

High quality work will include:

-Enumeration of risks that specifically apply to the implementation of the solution.

-Identification of risks based on research and analysis of industry practices.

-Each risk must have a mitigation measure that is quantifiable and substantial.

-Correct critical path analysis and determination of critical path time,

-Quality computer-aided drawing of project network diagram which highlights the critical path through the network, identifies slack, and critical path time,

-Gantt chart that is easily followed with activities and times clearly labeled.

-Consistency between Project diagram, critical path analysis, and Gantt chart.

Finding 2.1: Met

In the Spring 2023 AGSM 440 course, 9 of 9 (100%) of the artifacts were evaluated by two faculty members as successful (8) or very successful (1) in the assessment of their project management skills in the risk analysis and implementation plan project report. The aggregate score was 85.3/100, which is in the category of "Successful." The students provide risk analysis and implementation of their recommended solution to industry clients who posed the problem assigned to the team.

While this is down slightly from the previous year score of 90.7/100, the AGSM committee has determined that the deviation is statistically not significant, and that the AGSM students are well prepared to conduct project management operations.

Measure 2.2 – Exit Interviews of Graduating Seniors

Data Collection: Graduating Seniors will complete the self-assessment just prior to graduation, regarding their opinions of their abilities. Response options, assigned scores of 5 to 1, respectively, were Very Well, Adequately, Uncertain, Inadequately, and Poorly.

Methodology or data analysis strategy: This is a self-assessment and will be compared to the instructor assessment presented earlier to determine level of consistency between measures.

[See Senior Survey under *Supporting Documentation*.]

Target 2.2

The AGSM Curriculum Committee determined that students would self-assess as an average of 3.75 or higher prepared in related questions (effectively use decision processes for problem solving of open-ended situations similar to those experienced in industry) using a Likert scale of 1-5.

Finding 2.2: Met

The AGSM Senior Survey 2023 showed a self-assessment score of 4.69 in this category.

The 2021-year self-rating was 4.50. The 2022 score was 4.56. The 2023 score of 4.69 continues an upward trend in this area and demonstrates a significant increase as determined by the AGSM Curriculum Committee. The implication is that students continue to feel very confident in their ability to perform risk analysis and implementation planning at the culmination of their curriculum.

Use of Results

The measure has been met for project management and continued improvement is seen in student performance and classroom discussion and demonstrated understanding of project management tools. To continue to improve student learning, additional emphasis on this topic will be accomplished by Capstone Instructors by conducting an active learning project management exercise during the fall semester based on the fall project. Implementation timeline will be:

Week 1: Project assignment

Week 3: Project description due

Week 5: Background section due

Week 7: Flow analysis and potential solutions due

Week 8. Recommended Solution due

Week 10: Conduct Active learning exercise using the Critical Path Method for fall project (activities, precedence, duration, triple-time estimates, variance, etc.)

Program faculty believe this active learning exercise will emphasize the project management tools and also improve the student's ability to build network flow diagrams and project timelines. Communication of project management tools and techniques continues to need improvement and this exercise should demonstrate best practices for displaying the analyses and charts within the report.

Charts that communicate the implementation timeline of solutions should have the following basic structure: activity, precedence, duration, triple-time estimate, variance, and critical path time for project completion. Successful completion of charts and diagrams within the report using this process will indicate successful achievement of project management learning outcomes. These artifacts will be assessed in the assignment above.

Capstone instructors met and noted the tables in the Gantt Charts and Network Flow diagrams were not complete enough nor did they stand alone. Students were using multiple tables to communicate the project timelines, instead of the integrated Gantt Chart they were taught to use in AGSM 301 and AGSM 473. This matter was discussed in the AGSM Curriculum committee and the committee determined more emphasis on project management processes and tools would result in more clarity on project management reports.

Status Update on a Previous Action

ACTION PLAN (2016): Improve Written Communication with prescribed use of ASABE style.

Written Communication. Based on the findings of our measure of written communication, we are seeing improvement in this area. Our analysis showed that students are improving in their technical writing experience prior to the Capstone Courses. We have integrated more structured writing assignments in select AGSM courses. The main focus areas of writing improvement will be the use of business writing style, conforming to the ASABE Style Guide, using proper citations, references, and correct labeling for tables and figures. These can be feasibly accomplished in AGSM classes with lab reports or with any writing assignment in an AGSM class. We will begin with AGSM 125, 201, 335 and 435 in AY2016-2017.

Writing skills among our students continue to improve as a result of adding ASABE Style Guide instruction in AGSM 125 followed by several simple writing assignments which focus on the use of the style guide (see AGSM 125 syllabus attached). Capstone instructors reported to the AGSM Committee that writing skills continue to improve over previous years. Not only are overall scores higher, but the instructors report that students are also making fewer technical errors involving style and format, and other fundamental writing areas that plagued this course.

Supporting Documentation

Measure: Capstone Economic Analysis Report

Homework 4 Economic Analysis and Recommended Solution Rubric

HW 4 Grading Rubric:

	Max	Score
Required subject matter elements **meet expectations** listed in assignment *[Cost and profit analysis of potential solution(s), Investment and operating costs, positive and negative cash flows, total investment cost, payback period, rate of return, net present value, financial impact, detailed recommended solution section]*	150	
-demonstrates adequate **research** (depth and variety of references)	100	
-demonstrates adequate **analysis** (depth of thought and detail)	100	
-Professional **tone** suitable to client (business writing style)	100	
-Clarity and concise **style** (ease of understanding, economy of words)	100	
-**Organization** (paragraph structure; established outline, good use of tables and figures, etc.)	150	
-Correct use of **ASABE Style guide** (Tables, figures, citations, references, etc.)	100	
-**Grammar, spelling, punctuation** (self-explanatory)	100	
-File naming convention	(*-50)	
-Change/improvement from initial draft (level of effort to incorporate marks)	(* -100)	
TOTAL	**900**	

*Maximum deduction of 50 points for file naming and 100 points for lack of significant corrections from initial draft.

Measure: Exit Interviews of Graduating Seniors

Senior Survey

In the table below, please indicate in the checkbox to the right the answer that best represents your response to the statement.

My undergraduate education has prepared me to….	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
manage diverse personnel groups in business environments					
assemble, implement, and manage technical systems					
perform financial analyses on existing and potential technical systems					
to effectively use decision processes for problem solving of open-ended situations similar to those experienced in industry					
work effectively as an individual and in teams					

I feel I gained mastery of the material in the following subjects	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
Machinery Management (AGSM 201 & 310)					
Systems Analysis (AGSM 301, 439, 440)					
Unit operations for food and agricultural processing (AGSM 315 & 403)					
Electricity and electronic controls (AGSM 325 & 470)					
Soil conservation and environmental systems (AGSM 335 & 337)					
Communication of technical/financial information (tech writing, W courses)					
Industrial safety practices and management (AGSM 360)					
Business, economic and accounting principles					

(Continued on next page)

Questions for class discussion

1. What are the **best** aspects (or classes) of the AGSM degree/curriculum?

2. What are the **least** effective aspects (or classes) of the AGSM degree/curriculum?

3. What suggestions do you have for improvement of the curriculum?

4. Discuss the effectiveness of the Senior Capstone experience. What should we do differently to make it better?

5. Did you participate in a study abroad program or Mexico exchange? *Why or why not*? Please describe your experience if yes.

6. Did you pursue or obtain an internship? Why or why not? Please describe your experience if yes.

7. Did you participate in undergraduate research? Why or why not? Please describe your experience if yes.

8. Which of the following subject areas was most interesting to you?

   Power and Machinery, Food Processing, Water and Natural Resources, other: _____.

   Which was them were least interesting?

   Power and Machinery, Food Processing, Water and Natural Resources, other: _____.

9. What vocation do you intend to pursue with this degree? *How will this degree help you*?

10. What drew you to this major? Describe how it did or did not meet your expectations.

11. How would you describe the AGSM degree to others?

12. Other comments or suggestions?

Measure: Capstone Risk Analysis and Implementation Plan

Homework 6 Risk and Implementation Plan Rubric

HW Grading Rubric:

	Max	Score
Required subject matter elements **meet expectations** listed in assignment [Identification and discussion of risks that may impact recommended solution and the mitigation of each risk, discussion of impact of ranges of values, Implementation plan (narrative, timeline, strategies, graphical depiction of the network steps)]	150	
-demonstrates adequate **research** (depth and variety of references)	100	
-demonstrates adequate **analysis** (depth of thought and detail)	100	
-Professional **tone** suitable to client (business writing style)	100	
-Clarity and concise **style** (ease of understanding, economy of words)	100	
-**Organization** (paragraph structure; established outline, good use of tables and figures, etc.)	150	
-Correct use of **ASABE Style guide** (Tables, figures, citations, references, etc.)	100	
-**Grammar, spelling, punctuation** (self-explanatory)	100	
-File naming convention	(*-50)	
-Change/improvement from initial draft (level of effort to incorporate marks)	(* -100)	
TOTAL	**900**	

*Maximum deduction of 50 points for file naming and 100 points for lack of significant corrections from initial draft.