2022 ASSESSMENT REPORT

AGR315117 - AGRICULTURAL SYSTEMS

Feedback for future students and teachers

The external assessment consists of a folio of two main sections:

1. The Agricultural Technologies – Engineering Solution Project Folio
2. The Agribusiness case study

The Educational Assessment Specification in the supplementary documentation on the TASC AGR315117 course website provides the minimum word limit for the Agribusiness case study and the maximum page length for the Engineering Solution Project Folio; in both instances the word and page limit does not include references.

The folio will be assessed against:

Agricultural Technologies – Engineering Design Solution Project Folio

Criteria 6 (Elements 1, 2, 7) – Examine technologies and technological innovations employed in the production and marketing of agricultural products

Criterion 8 (all Elements) – Apply appropriate engineering principles to agricultural problems and situations

Criterion 9 (Elements 6, 7, 8, 9) – Explain the impact of innovations, ethics and current issues on Australian agricultural systems.

Agribusiness Case Study

Criterion 2 (Elements 3, 4, 5, 7) – Analyse physical and biological systems that support sustainable agricultural production

Criterion 5 (All Elements) – Assess general business principles and decision-making processes involved in sustainable farm management and marketing of farm products

Criterion 9 (Elements 2-5, 7, 8, 9) – Explain the impact of innovation, ethics and current issues on Australian agricultural systems.

FOLIO PRODUCTS

Students do well in the external assessment when they fully utilise their maximum word count/page length to fully explore their chosen topics.

Students should note the importance that is placed on describing and assessing farming systems and operations through an integrated STEM inquiry approach; in this case, farming systems and operations in real-life situations. The final product should reflect the various systems and sub-systems that support agricultural production and maximise productivity. To this end, successful learners should ensure that their folio has evidence to support their learning outcomes in each of the four STEM areas. The Learning Outcomes described in the TASC course description provide a useful tool for self-reflection to ensure that evidence of this learning is provided within the folio.

AGRICULTURAL TECHNOLOGIES – ENGINEERING DESIGN SOLUTION PROJECT FOLIO

Successful students were able to demonstrate their understanding of each of the Elements of the three (3) Criteria externally assessed. Specifically, there are seven (7) distinct parts of this section of the folio which must be addressed: the Brief, Background, Research (must include analysis/comparison, survey, feedback) Design Development, Final Design, Evaluation and References. At a very minimum, each of these seven parts must be evident within the folio text.

Successful folios reflected a sound combination of technical and theoretical understandings combined with practical applications that reflected their interests and authentic local agricultural enterprises.

Throughout assessment, the key differential is contained in the verbs used in the Criteria; these state grades of complexity from routine actions like *describe*, through to *examine* and on to verbs like *analyse* or *evaluate*. Successful students sought to concentrate on the higher order strategies and provide evidence of these. These key words must be understood, and evidenced in the folio. To *describe* something is to set out its key features or characteristics. To *examine* is to give close, detailed attention to something. To *evaluate* means to make judgements based on the evidence. To *analyse* is break something into its component parts and show how they relate to one another. Paying close attention to the criteria elements and ensuring that the folio contains these elements will ensure greater success.

Students who achieved well in the Engineering Design Solution section generated a design solution, used technology skills, processes and systems-thinking and management skills to bring their project to fruition. They implemented risk assessment and mitigation strategies, evaluated or justified why the engineering solution was needed, and suggested modifications and improvement to the solution they provided, following a period of prototype testing and user feedback. Successful students would have scoped out their project early enough in the year to allow for successful completion, and provided records of this planning.

CRITERION 6: Examine technologies and technological innovations employed in the production and marketing of agricultural products

Here the key to success is to analyse issues about the development and use of biotechnology in food and fibre production, and include reference to any appropriate regulations. Climate plays a crucial role in agricultural production and research evidence needs to be provided to explain the long-term climate variability, including the impact of La Niña and El Niño. Care must be taken in the referencing and appropriate use of attributing sources of information.

CRITERION 8: Apply appropriate engineering principles to agricultural problems and situations

This is an important Criterion where all seven (7) Elements are externally examined. Where students are concerned to keep within the word limit, it is advisable to make use of Appendices to provide supplementary information. These might include figures, tables, maps, photographs, raw data, computer programs, interview questions, sample questionnaires and so on. Care needs to be taken to reference the supplementary information in the body of the folio, but appendices are a way to provide evidence and not exceed the word count.

Having set out to solve a routine or non-routine problem, it is useful to consider reflecting on questions such as:

- to what extent...
- how successful...
- what is the role of...
- what evidence is there to support...
- what is the impact of....
- is there a correlation between...
- how reliable is...

in order to justify or evaluate the design solution and what supportive evidence is available to justify your evaluation. Highly successful students will take this one step further by identifying and undertaking modifications, and analysing and justifying the factors which have influenced the development of the system and its use.

CRITERION 9: Explain the impact of innovations, ethics and current issues on Australian Agricultural systems.

External assessment of this criterion focuses on Elements 6, 7, 8, and 9. The examiners look at how well the student has evaluated reasons for adopting emerging technologies and their impact in agriculture before turning their attention to the referencing conventions and how the student has differentiated the information, images, and ideas and words of others from the learner's own.

AGRIBUSINESS CASE STUDY

The purpose of studying an agribusiness is to observe how a business is run, in order to learn from the experiences and lessons gleaned from examining that business.

Each case study considers a farm or agribusiness firstly as a business and then as a part of a wider agri-business sector. The following points are crucial for making a case study effective;

- Analysing and synthesising of data.
- Including essential business and climate data.
- Presenting the information in a brief and effective format.
- Making the product visually attractive and interesting to read.

Students who achieved highly demonstrated their understanding of the factors that influence or affect the enterprise or business by collecting and evaluating the following data:

- The inputs into the production.
- Production processes and timelines.
- Risks involved with the production process.
- Environmental analysis – considerations such as waste minimisation strategies, climate change and influences.
- Outputs – both intended and unintended.
- External e.g., government factors that influenced the operation of the small business project.
- Budgeting – planned and actual.
- Marketing of products.
- Success of the business and aspects for future improvement.
- References.

All of this must be achieved within the 3,000-word count.

Examiners focus their attention on Criterion 2 (Elements 3, 4, 5, 7) – Analyse physical and biological systems that support sustainable agricultural production; Criterion 5 (All Elements) – Assess general business principles and decision-making processes involved in sustainable farm management and marketing of farm products; and Criterion 9 (Elements 2-5, 7, 8, 9) – Explain the impact of innovation, ethics and current issues on Australian agricultural systems.

For Criterion 2, what must be evident is reference to climate variability and its effect on agricultural production, strategies for biosecurity, commentary on the physical, chemical and biological properties of soil, air and water and their impact on the property, and some analysis and reference to the tensions between sustainability and profitability in farming.

Criteria 5 is an important criterion where all elements are externally assessed. This calls for both a broad-brush overview of the dynamic elements of farming, through to deeper and close analysis of the financial situation of the enterprise, including calculating a gross margin.

Government influences must be factored in, along with the marketing chain, the scheduling of operations in the production cycle, and all of this made quite specific through analysis of data, reports and conversations with the personnel at the site. This calls for a good deal of planning, drafting, editing, and decision making to highlight the most important information in the most interesting and informative means possible.

In Criteria 9, the examiners again focus their attention on reference to long-term climate variability, water storage and trade water resources, the effect of greenhouse gases on atmospheric temperature and climate change, and they ensure that the student has differentiated the information, images and words of others from their own. Adherence to referencing conventions are also important.

External assessment panels commended:

1. Students who utilised the full complement of the word count or expected page length for each section, and who provided varied sources of information such as charts, diagrams, and photographs, with all of these accurately identified and attributed.
2. Students who addressed all the appropriate Elements of the Criteria, making explicit reference to the area being referenced, even where this may not have been evident in the agribusiness. For example, 'there is ample water available on the farm, so no water trading is in operation, although nearby farmers are using …'
3. Students whose work was meticulously proof-read, well-written and interesting to read.
4. Students who made good use of data to interpret financial information, inputs and outputs, rates of change, and who were specific rather than generalised in their descriptions and analysis.
5. Students who used and reported on a full range of communication types: email, interviews, face-to-face discussions, phone conversations or website/blog feedback to support their case study or the results and feedback on their engineering solution.
6. Students who were accurate and methodical in their referencing conventions, including in-text conventions, and reference lists or bibliographies.