2024 ASSESSMENT REPORT

AGR315117 AGRICULTURAL SYSTEMS

General Comments

The external assessment consists of two main reports:

- The Agricultural Technologies – Engineering Solution Project Folio
- The Agribusiness Case Study

The Agricultural Systems External Assessment Specifications 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 is assessed against:

1. **Agricultural Technologies – Engineering Design Solution Project Folio**
   Criterion 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.
2. **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.

It is vital to understand and integrate the four STEM dimensions—Science, Technology, Engineering, and Mathematics into the inquiry sections for successful completion of the external examinable components of this course. Engaging in demonstrating the impact of agricultural technologies and scientific research in the engineering systems-thinking, the design thinking cycles with the use of mathematical, scientific, or graphical methods or other digital tools throughout the process is essential. In the case study, a systematic approach to the factors of quantity or quality and sustainability, as well as financial pressures that impact upon decision-making is also important.

Referencing is a critical component of Criterion 9 in both sections. Referencing conventions include:

- Using the author/year format for in-text citations

- When using personal communications and labelling of own images taken to support the folio work, names were replaced with the TASC candidate number (date), giving a title of the image or the description: ‘Personal communication, date, or title of survey response
- Organising the reference list in alphabetical order by the author or organisation name
- Understanding the distinction between a reference list (which includes only sources cited in the folio) and a bibliography (which lists all sources consulted)
- Using the Harvard referencing style is recommended in the TASC External Assessment Specifications.

It is important for students to understand report writing styles, noting that the tone, language, and formats required for the two sections differ:

- Agribusiness case studies use a professional and objective tone, with clear and concise language, focussing on analysis and evidence-based conclusions.
- Engineering design solutions maintain a technical and precise tone, emphasising clarity and detail in the design elements, perspective, dimensions, prototypes, other diagrams, or calculations aligned with standard design practices.

A further key piece of advice relates to the length of the folio—less successful students often failed to fully utilise the available word limit and did not include a word count as required by the External Assessment Specifications.

There was much to commend in student work overall. Successful students ensured that they:

- Utilised the full complement of the word count or expected page length for each section and acknowledged who provided varied sources of information such as charts, diagrams, and photographs, with all these accurately identified and attributed/referenced.
- 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.
- Provided reports specifically referenced and provided examples of the four STEM dimensions and their application in productive, innovative or sustainable agricultural systems.
- Meticulously proofread, making effective use of data to interpret financial information, inputs and outputs, or rates of change, or design changes, and who were specific rather than generalised in their problem analysis of the agribusiness selected or the engineering design solution pursued.
- 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 investigations, internet search of existing products, or results and feedback on their engineering solution.
- Were precise, accurate and methodical in their referencing conventions, including in-text conventions, and reference lists or bibliographies.

Engineering Solution Project Folio

It was evident that successful students had made effective use of the TASC External Assessment Specifications to consider the requirements of their engineering solution to:

- generate a design solution
- use technology skills, processes and systems

- apply management and planning skills to an engineering challenge
- implement risk assessment and mitigation strategies
- evaluate and justify engineering solutions
- suggest modifications and improvements to the engineered solution.

The project folio outlines and explains the engineering design and development and must reflect these design cycle stages:

- a design brief (problem/challenge, background, requirements, and limitations)
- research (analysis/comparison, survey, feedback)
- concept sketches, notes, annotations
- tools, materials, techniques, and experiments/prototype/testing
- production stages
- evaluation of outcomes (of requirements from initial design brief).

Successful students began by presenting a well-considered design brief where they demonstrated a clear understanding of the TASC External Assessment Specifications, often providing an introduction or overview of the problem, the environment, and a clear problem statement before detailing the design brief. Recognising the importance of the design brief in guiding the project, these students researched and applied the principles of effective design briefs, using them to outline the project requirements for minimising environmental impact, making cost savings in labour, materials or energy, improvements to animal welfare or alignment with government targets.

To support their work, these students included detailed project timelines and utilised project management tools such as Gantt charts. The most effective submissions supplemented these visual representations with commentary, interpreting the figures given, contextualising the data, and explaining its significance. In the evaluation phase, successful students demonstrated their ability to critically assess their work. They sought feedback from teachers, industry professionals, neighbours or family members to validate and improve their designs, thereby enhancing the credibility and practicality of their solutions. Measurement data was provided to evaluate the effectiveness of their solutions, with commentary and reflections that offered insight into the outcomes. These students concluded their projects with a summary of their objectives, the extent to which they were achieved and an overall assessment of their design's effectiveness.

Criterion 6

In examining the technologies and innovations in the production and marketing of agricultural products, students needed to identify the three Elements – examine or evaluate the ongoing research, the impact of technologies on production or marketing as well as the impact of any new developments that will assist the agricultural industries. Examples often included the development and use of biotechnology in food production, including reference to any new regulations. As climate plays a crucial role in agricultural production and research, evidence needed to explain the impact of the long-term climate variability, with La Niña and El Niño. Care is needed in referencing and using authoritative sources of information.

Criterion 8

This is an important Criterion where all seven (7) Elements may be appropriate engineering principles to apply to problems or situations. Students with successful folios were concerned with the word limit and made use of Appendices to provide supplementary or tabulated information. These might include figures, tables, maps, photographs, raw data, computer programs, interview

questions, sample questionnaires to be referenced as supplementary information in the body of the folio. Setting out to solve a routine or non-routine problem, it is useful to consider reflecting on these Elements as design cycle questions, such as what is the justification to design a new solution? where is the evidence? what evaluation criteria will be used? have the measurements been interpreted well? are the work, health and safety procedures going to be acceptable? how can some risk mitigation strategies be implemented? or how can modifications be made and tested to optimise performance?

Criterion 9

Explaining the impact of innovations, ethics and current issues on Australian agricultural systems is the focus. External assessment of this criterion focuses on Element 6 and how well the student has evaluated reasons for adopting emerging technologies and explained their impact in agriculture. Elements 7, 8 and 9 address the referencing conventions and how the student has differentiated the information, images, and ideas and words of others from their own.

Agribusiness Case Study

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 report visually attractive and interesting to read.

In this section the use of graphical information is encouraged. Successful candidates effectively incorporated diagrams, charts, and graphs to illustrate key points, enhancing the reader's understanding of the case study. These students used commentary to bridge the gap between raw data and personal communications with the agribusiness owner/s. By providing context, clarifications and insights, they ensured that their visual elements were meaningful and supported their overall narrative. In contrast, weaker candidates presented data and figures in isolation, without the necessary explanation, narrative or analysis. Examiners noted that successful students went beyond mere presentation of data; they analysed it thoughtfully, identified patterns, and drew meaningful conclusions. This demonstrated a deep understanding of the implications of the figures and reflected a higher level of intellectual engagement.

The high-achieving students displayed their critical thinking by linking their analysis back to the project's aims and outcomes, which earned them higher ratings. Conversely, less successful candidates often relied on broad, generic, or internet-sourced marketing statements that lacked specific relevance to their agribusiness context. This approach suggested they were merely attempting to meet criteria without genuinely engaging with the material, resulting in lower evaluations.

Criterion 2

Analyse physical and biological systems that support sustainable agricultural production. References to climate variability and its effect on agricultural production, strategies for biosecurity, a commentary on the relevant physical, chemical, and biological properties of soil, air and water and their impact on the property must be evident. Some analyses through reference to the tensions between sustainability and profitability in farming is worthwhile.