The CEICAH Chemical Engineering stream in the 3707 Bachelor of Engineering (Honours) program at UNSW trains graduate engineers with specialist discipline knowledge and who have developed the Engineers Australia Stage 1 Competencies.
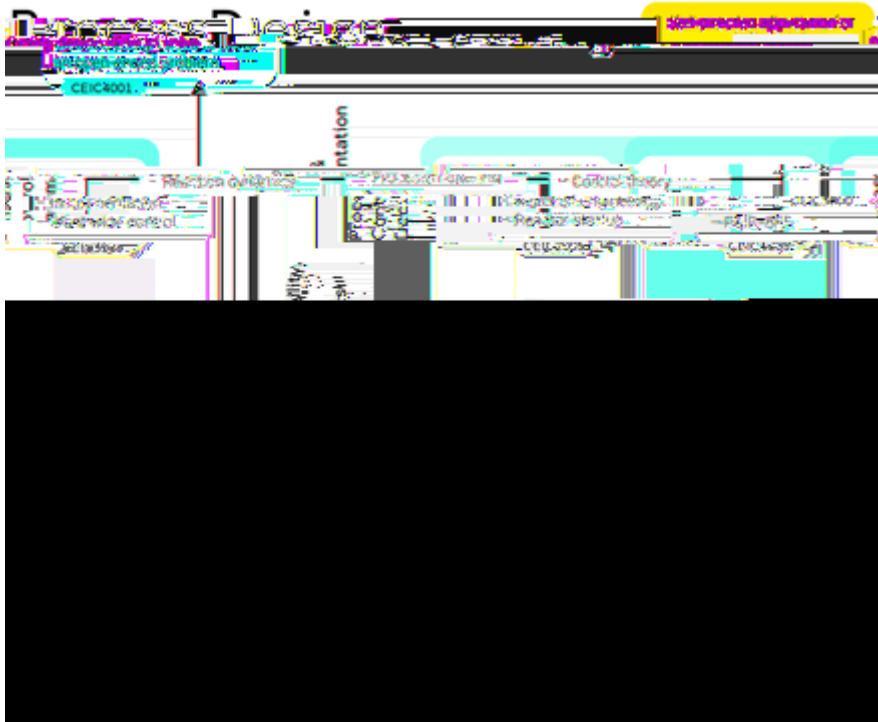
In this integrated graduate specification, we describe the aims of the stream, what sets chemical engineering apart from other engineering streams, the stream learning outcomes, and the overall curriculum. Detailed mappings between courses, stream learning outcomes and EA Stage 1 Competencies are included.

Chemical Engineering involves researching, developing and improving properties of products we use every day through the selection of raw materials, the design of chemical processes, and improving the conditions for production. It's about taking projects from inception as a research proposal, through product development and on to commercialisation and manufacture. At UNSW, Chemical Engineers learn how to apply advanced knowledge in chemical engineering and chemistry to optimise complex chemical processes in environmental management, general industry and services like water delivery. Chemical Engineers master the entire process, extrapolating small scale, laboratory chemistry into large, industrial scale production. To get work ready, graduates apply these skills through 60 days of approved industry training.

Our Chemical Engineering alumni work in a broad range of industries, covering everything from the traditional petrochemical industry through to the emerging hydrogen economy, and from food manufacture to mineral processing. The defining characteristic of a successful chemical engineering graduate is the ability to apply knowledge from a broad foundational of chemistry, mathematics, physics and computing to this wide range of contexts; moreover, the chemical engineer much include safety, the environment, people, and economics within their work.

The Chemical Engineering stream in the BE(Hons) aims to ensure a rigorous foundation of chemical engineering theory is developed and that graduates are able to apply this theory to a range of design and operation scenarios. As an Honours level stream (AQF level 8), the curriculum contains advanced disciplinary knowledge, enquiry based learning, and an introduction to research. Graduates are able to use their advanced skills to analyse critically, evaluate and transform knowledge into chemical engineering designs and solutions. Moreover, they are able to develop and communicate solutions to complex problems with autonomy and professional judgement.

The stream is composed of individual courses that are articulated into four thematic areas: process design, thermodynamics, fluids & materials, lifelong learning. It is important that both staff and students understand the connections between the courses that together produce a graduate engineer. As part of our curriculum development and review cycle, these thematic areas have been summarised in the following diagrams, that help explain to our students and staff how the individual courses are designed to fit with each other, developing a graduate engineer at the successful conclusion of the studies.

Figure 1: Chemical Engineering specification for the Process Design Theme

Figure 2: Chemical Engineering specification for the Thermodynamics theme

Figure 3: Chemical Engineering specification for the Fluids & Materials theme

Table 1: Normal enrolment sequence for the Chemical Engineering stream
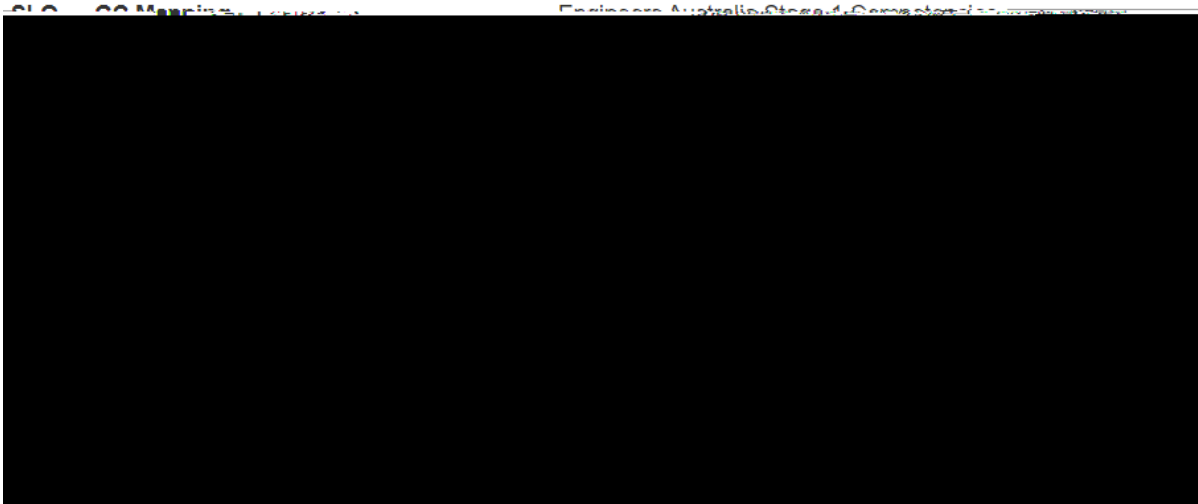
Year 1

3.

these courses were chosen as they represent a popular cross-section of the courses taken by recent cohorts: CHEN6701 Advanced Reaction Engineering, CEIC8204 Entrepreneurship and the Innovation Cycle, CEIC8341 Membrane Processes.

Table 2: Mapping of the stream learning outcomes to the Engineers Australia Stage 1 Competencies

Table 3: mapping of courses to the stream learning outcomes

CO → SLO Mapping		Stream Learning Outcomes (SLOs)							
SLO	Course (CO)	SLO1	SLO2	SLO3	SLO4	SLO5	SLO6	SLO7	
CEIC1000		12.5	20.2	9.2	0.0	16.0	13.0	16.0	13.0
CHEM1011		70.0	30.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 4: mapping of courses to Engineers Australia Stage 1 Competencies

Table 5: