

## Case Study: University of Wollongong (Wollongong, New South Wales, Australia)

The University of Wollongong is a public, multicampus university with approximately 26,000 students. It has nine faculties and offers 30 degrees across its campuses in Australia and overseas.



### FACULTY OF SCIENCE

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**Science at Wollongong:** The [Faculty of Science](#) consists of three schools of roughly equal size: Chemistry, Biology, and Earth and Environmental Sciences. The Faculty offers a range of three and four year Science degree programs. The most general is the three year Bachelor of Science (BSc) with an average annual intake of 260 students. The entry requirement for the BSc is an ATAR of 75 (admissions ranking from 0-100, with 100 the highest rank).

**Mathematics requirements for entry into Science:** Mathematics is not required for entry into the BSc although it is assumed knowledge. Students without at least [HSC Band 4 Mathematics](#) or equivalent are required to take a mathematics subject (usually [MATH151](#)) in the first year.

The Wollongong case study focuses on [Bachelor of Science](#) majors in the [Biological Sciences](#), and is framed around a model of educational change based on the work of [Michael Fullan](#).



## Initiation of Change

*“Who prompted need for QS in science and why?”*

At Wollongong each degree program is reviewed every five years, with the reviews run by the relevant faculty education committee.

Strategies around the enhancement of QS outcomes have largely occurred independent to cyclical reviews of degree programs and have been driven by the needs of individual disciplines.

## Vision for Change

### “What do QS in Science look like?”

The University of Wollongong has identified institutional [Graduate Qualities](#), which have been further contextualised at the Faculty level.

The [Science Graduate Qualities](#) assume quantitative skills (QS) with statements such as:

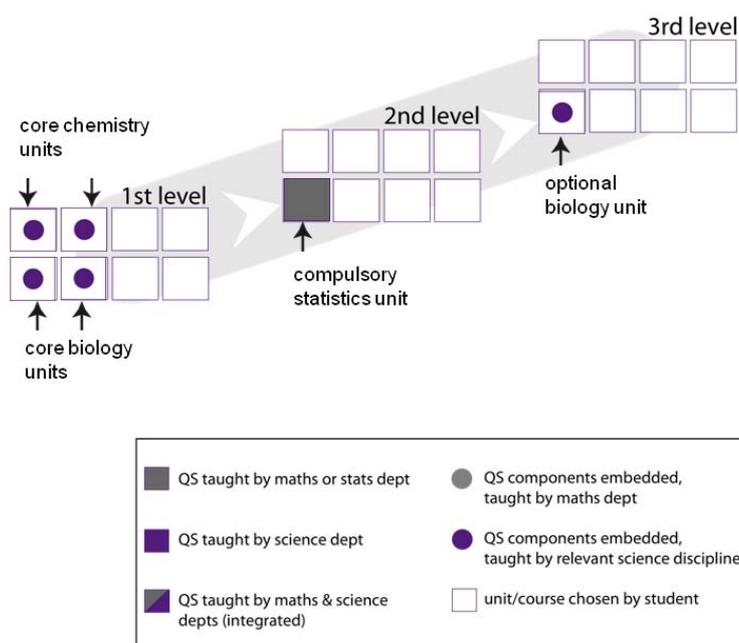
- *Scientific approach to the acquisition, analysis, and interpretation of data*

Currently, staff within the Faculty are mapping graduate qualities across the science curriculum.

## Implementing for Change

### “How is need for QS in Science translated into practice?”

**Curriculum Structure for building QS:** Students are expected to enrol in the major having either completed secondary school mathematics, or complete an equivalent unit when they begin their study at Wollongong. QS are embedded within level 1 discipline units. A QS pathway exists through a level 2 statistics unit followed by the embedding of QS components in level 3 biological sciences units.



**1<sup>st</sup> level** features a mathematics unit taught by mathematicians for those whose mathematics on entering university is not up to the required standard. QS components embedded within compulsory chemistry units in both semesters with specific [QS resources](#) and QS components embedded within compulsory biology units in both [1<sup>st</sup>](#) and [2<sup>nd</sup>](#) semesters.

**2<sup>nd</sup> level** features a compulsory unit: Statistics for the Natural Sciences [STAT252](#) taught by School of Mathematics and Applied Statistics.

**3<sup>rd</sup> level** QS component embedded within ecology subject (optional) [BIOL355](#).

**Interdisciplinary QS:** The need to address QS of students across Science has sparked cross discipline conversations. However, there are no formal structures or mechanisms that facilitate or promote cross-departmental planning around building QS.

## Evaluating the Change

*“How effective has the change to build QS in Science been?”*

Institutional standardised evaluation procedures are in place at Wollongong, including [general unit surveys](#).

**Evidence of QS learning outcomes:** To date, in the Faculty of Science, and in the Biological Science majors, there has been no formal evaluation on the effectiveness of the changes in the curriculum to build QS.

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Thanks to the following staff at the University of Wollongong for collaborating with us to document this case study:

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This case study is up to date as of September 2011. The interviews to gather this data were conducted in May 2011.

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