

Engineering a sustainable world with chemical engineering

The Institution of Chemical Engineers, IChemE, has set out a strategy for the next 4 years that puts sustainable systems at the heart of chemical and process engineering. Alongside other professions, chemical engineers will play a vital part in addressing the challenges ahead. In particular, contributing to these United Nations Sustainable Development Goals (SDGs):



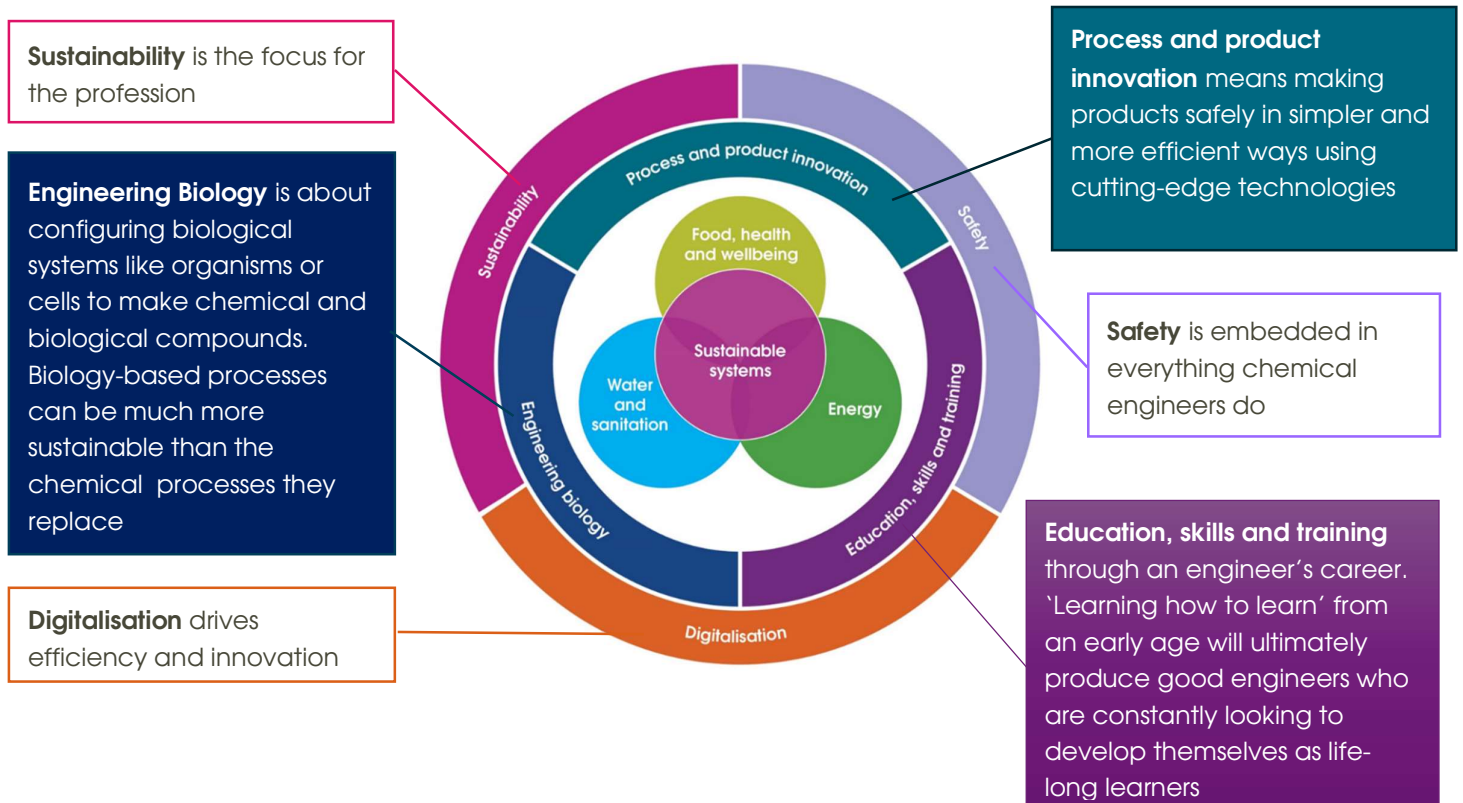
Are you ready to work towards solving some of the world's most pressing challenges?

As a chemical engineer you will be able to combine your passion for science and maths, channel your creative side, collaborate with people from other disciplines and work towards solving these problems.

Sustainable systems are where these three sectors overlap:

- Food, health and wellbeing
- Energy
- Water and sanitation.

These have an impact on everyone and are at the core of the way chemical engineers view the future. Chemical engineers design, develop and implement complex systems across industries and essential services. Let's take a closer look at what this means.



Challenges for these sectors

- **Food, health and wellbeing:** making food production more sustainable on a large scale, finding alternative sources of protein and new ways of getting medicines and healthcare to people
- **Energy:** managing the change to a low emissions future, reducing the amount of carbon dioxide being produced and scaling up renewables
- **Water and sanitation:** managing limited water resources better and improving access to clean water

Key terms and what they mean

- **Circular economy:** resources and materials are reused many times instead of being extracted, used and then discarded
- **Systems thinking:** looking at complex systems and identifying relationships, patterns and interdependencies so that you can identify potential conflicts and unintended consequences when solving problems

How your GCSE subjects can contribute to a chemical engineer's knowledge and skills

Mathematics is the most important subject area you will study because it underpins every aspect of chemical and process engineering. Alongside a deep understanding of scientific principles, from physics, chemistry and biology, it is essential to have good practical skills. Working safely and working scientifically are key to becoming a chemical or process engineer.

Other GCSE subjects that can support your pathway into chemical and process engineering include business, economics, geography and law. For study at university or through an apprenticeship, find out what subjects and grades are needed as this can help you make choices for A-level or equivalent subjects.

Other skills that chemical engineers need

In addition to your academic qualifications, you need to be creative, a problem-solver, work well as part of a team, be organised and have an eye for detail. Inside and outside school, through different activities and clubs, you can develop some of these skills.

Next steps

For more about chemical engineering
Go to www.icheme.org/discoverchemeng
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Engineering a Sustainable World
The Chemical Engineering Challenge

