Biotechnology & Genetics

Example 10 hr bespoke programme for a pre-degree student

Module 1: Molecular toolkits

- The central dogma of molecular biology
- Gene editing and cloning: genetics in action
- Genome sequencing

Pre-tutorial preparation—independent learning to help you get ahead

Work through the following, making a note of anything that you don't understand: Help Me Understand Genetics, The Genetic Code | Boundless Biology, What is genome editing? | Facts , Foundations of Molecular Cloning - Past, Present and Future

Formal submission—your tutor will give written feedback on each submission

Explore Animals and Plants for areas of interest and find scientific papers within this area. Google Scholar is a helpful search engine. Identify examples of each of the tools discussed in tutorials and write a summary of how they have been used in the research.

Module 2: Genetic engineering today

- CRISPR: a contemporary example of biotechnology in action
- Plant domestication and improvement
- Plant genetics today

Pre-tutorial preparation

1. Describe three things that advance our lives which are made possible by biotechnology
2. Read the following and be prepared to discuss: Genetically Modified Organisms: Editing Genes with CRISPR-cas, What are genome editing and CRISPR-Cas9?

Formal submission

What are the ethical concerns behind using CRISPR to edit the genome of humans? Discuss the arguments for and against the use of this technology in this way. (800 words ± 100)

Module 3: Science communication for ethical debate

- Feeding a global population: crop improvement through gene editing
- Debate: Are GMOs necessary to tackle climate change?
- Journal club: from journals to good, informative, general scientific writing

Pre-tutorial preparation

1. Read GM plants Questions and answers
2. Choose one side of the debate and research your argument, with evidence to support it
3. A Guide To Writing Scientific Essays

Formal submission

Find a scientific paper focusing on plant genetics and write a summary in the style of one of Nature's 'News and Views' articles, including diagrams.

Example topics only. Exact content will depend on the expertise of the individual tutor and will be tailored to the prior knowledge, ability and interests of the student.