

Biotechnology and Genetics

Please note: this syllabus is an example for students aged 16-17 years old. This course is available for 13-15, 16-17 and 18-24 year old students, and adjustments will be made to course content according to student age group.

Course introduction

Course objectives

- To introduce you to the academic study of Biotechnology and Genetics and the various practical applications in the real world
- To gain theoretical knowledge and practical skills in this field while exposing students to case studies involving infectious diseases and cancer
- To appreciate how key stakeholders in a biotechnology ecosystem namely academia, small medium enterprises (SME), mid-sized and large biotech/pharma companies, healthcare companies, hospitals, investors and policyholders all come together to address biotechnology challenges in today's world
- To provide an overview of the biotechnology ecosystem

Each topic will include a mixture of didactic or learning-assisted content (video, text, powerpoint) and self-directed learning activities to complete.

Topic titles

1. Biology of DNA/RNA, recombinant DNA technology and DNA sequencing.
2. Superbugs and infectious diseases.
3. Applications of artificial intelligence/ big data and machine learning in genetics.
4. New horizons for the early diagnosis and treatment of cancer.

Independent project work

This piece of work will combine all of the content covered in the course. Information covered during independent study, webinars and tutorials has been designed to help students achieve solid theoretical background knowledge coupled with data analysis and presentation skills.

The research articles, problem based learning exercises, videos and tutorials that comprise the course are specifically designed to provoke your innovation and creativity.

Students will be creating a scientific presentation on the topic "Gene Editing Technologies, Pros and Cons." This project will help students clarify background scientific concepts and gives students a practical output to showcase what they have learnt in this pivotal area of Biotechnology and Genetics.