

ENGINEERING

Engineering at Macademia introduces young people aged 12+ to how things work, how they are built, and how engineers solve real-world problems. Students explore key areas such as structures, materials, energy, and robotics while developing practical skills in designing, building, testing, and problem-solving.

The course is structured into six standalone modules, each running as a 6-week block (2-hour sessions). Modules can be taken in sequence or mixed with other subjects, allowing a flexible learning journey.

Through hands-on projects, students design and build their own engineering solutions, developing technical understanding and creativity. The course supports GCSE and A-Level studies while helping students build strong portfolio work and prepare for future study and careers in engineering and related fields.

Introduction to Engineering

1. Engineering disciplines explained
2. Engineering in everyday life
3. Problem-solving methods
4. Forces and loads
5. Team engineering challenge
6. Review and showcase

Engineering Design

1. From idea to prototype
2. Sketching and planning
3. Building and testing
4. Iteration and refinement
5. Technical communication
6. Design presentation

Structures & Materials

1. Structural principles
2. Materials testing
3. Stability and balance
4. Bridges and towers
5. Failure and improvement
6. Structural presentation

Robotics & Automation

1. Introduction to robotics
2. Sensors and movement
3. Control systems
4. Programming logic
5. Building an automated system
6. Robot challenge showcase

Energy & Systems

1. Energy basics
2. Mechanical systems
3. Electrical systems
4. Renewable technologies
5. System integration
6. Demonstration and review

Future Engineering

1. Smart cities
2. Transport innovation
3. Biomedical engineering
4. Space and extreme environments
5. Designing for the future
6. Innovation pitch

