

ESAT vs TMUA: which one do you need?

A course-first answer, plus the difference between 89-second subject problems and longer mathematical reasoning.

THE SHORT ANSWER

Your **exact university, course and entry year** decide. ESAT serves selected engineering and science courses through subject modules. TMUA serves selected mathematics and related courses through two maths papers. A subject name alone is not enough.

Checked against the sources named in this guide, August 2026. British English. Free to share.

1 The decision takes thirty seconds

Open the official page for every course on your UCAS list. Write the named test and, for ESAT, the named modules. If one choice says ESAT and another says TMUA, you may need both. There is no universal rule that one test cancels the other.

The tables below reflect our 2027-entry course review, reviewed on 1 August 2026. Requirements can change, so use them to route yourself and use the linked university page as the final check before booking.

1 The tell

If advice begins “Engineering students take...” rather than naming the university and course, it is too broad to book from. Imperial Design Engineering and Imperial Mechanical Engineering are both engineering, but the stored 2027 requirements name different ESAT module sets.

2 Cambridge, course by course

Course	Test	What the official sources say
Chemical Engineering and Biotechnology	ESAT	Mathematics 1, plus two chosen from Biology, Chemistry, Physics and Mathematics 2
Engineering	ESAT	Mathematics 1, Mathematics 2 and Physics
Natural Sciences	ESAT	Mathematics 1, plus two chosen from Biology, Chemistry, Physics and Mathematics 2
Veterinary Medicine	ESAT	Mathematics 1, plus two chosen from Biology, Chemistry, Physics and Mathematics 2
Computer Science	TMUA	TMUA is listed; Peterhouse and Trinity also list CSAT
Economics	TMUA	TMUA is listed
Mathematics	TMUA	TMUA is listed

3 Imperial, course by course

Department or course group	Test	Required ESAT modules, where applicable
Aeronautics	ESAT	Mathematics 1, Mathematics 2, Physics
Chemical Engineering	ESAT	Mathematics 1, Mathematics 2, Chemistry
Civil and Environmental Engineering	ESAT	Mathematics 1, Mathematics 2, Physics
Dyson School of Design Engineering	ESAT	Mathematics 1, Mathematics 2
Electrical and Electronic Engineering	ESAT	Mathematics 1, Mathematics 2, Physics
Life Sciences	ESAT	Mathematics 1, Chemistry, Biology
Mechanical Engineering	ESAT	Mathematics 1, Mathematics 2, Physics
Physics	ESAT	Mathematics 1, Mathematics 2, Physics
Business School	TMUA	Not an ESAT module choice
Computing	TMUA	Not an ESAT module choice
Mathematics	TMUA	Not an ESAT module choice

Our fuller 2027 course list also lists ESAT for Oxford Engineering and UCL Electronic and Electrical Engineering, while listing TMUA for examples including Oxford Mathematics and Computer Science, and UCL Mathematics and Economics. Combined courses and departmental variations are exactly why the live course page wins.

4 The formats are not cousins in matching outfits

	ESAT	TMUA
Structure	Five available modules; Mathematics 1 is compulsory, then the course sets the rest	Two papers: Applications of Mathematical Knowledge and Mathematical Reasoning
Unit of work	27 multiple-choice questions in 40 minutes per module	20 multiple-choice questions in 75 minutes per paper
Average budget	$2400/27 = 88.9$ seconds per question	$4500/20 = 225$ seconds per question
Content	Maths 1, Maths 2, Physics, Chemistry and Biology, depending on course	Mathematics throughout
Score	Separate 1.0–9.0 score per module; no ESAT total	1.0–9.0 scale for the test
Feel	Rapid recognition, compact application, approximation and option testing	Longer mathematical arguments, logical structure and sustained reasoning

The time budgets explain the emotional difference. ESAT often rewards seeing the shortest valid route before you have finished writing the longest one. TMUA gives more room per question, then spends that room on argument, definitions and logic. Both punish passive formula recall.

2 Try it

Do not choose practice by test name alone. For ESAT, train the exact modules on your course page. For TMUA, train both papers. If you need both tests, share algebra fluency between them but keep separate timed sets, because 89-second decisions and 225-second arguments are different sports.

5 Worked ESAT maths: recognise the invariant

Worked example Inverse square-root proportion without a calculator

Response time T seconds is inversely proportional to the square root of power P watts. When $P = 9$, $T = 20$. What power gives $T = 12$?

Write the relationship in the form that exposes what stays constant:

$$T\sqrt{P} = \text{constant}.$$

From the first condition,

$$20\sqrt{9} = 20 \cdot 3 = 60.$$

For $T = 12$,

$$12\sqrt{P} = 60 \implies \sqrt{P} = 5 \implies \boxed{P = 25 \text{ W}}.$$

Correct: Use $T\sqrt{P}$ as the invariant. It avoids finding and then carrying an extra constant through the working.

Trap: Treating T as inversely proportional to P gives 15 W. The square root is the whole test.

This is ESAT Mathematics 1 content with ESAT pressure: the algebra is accessible, but the relationship must be translated immediately and executed cleanly. A TMUA question may start with equally familiar algebra and use the extra time to ask what follows for every possible value, or which argument is sufficient.

6 If your choices require both

Do not split your week 50:50 by habit. Start with shared foundations, then weight the test with the earlier sitting or larger weakness.

- **Shared:** algebraic manipulation, ratios, graphs, proof habits, accurate arithmetic without a calculator.
- **ESAT-only emphasis:** required sciences, 27-in-40 pacing, approximation, rapid elimination, module-specific traps.
- **TMUA-only emphasis:** Paper 2 logic, longer chains, necessary versus sufficient conditions, and full two-paper endurance.

Book from the official requirement, not from the test you would rather sit. A beautiful TMUA score cannot replace an ESAT requirement, and vice versa.

7 Sources

Cambridge science and engineering admission test guidance

The 2027 Cambridge ESAT courses and module requirements recorded in our course navigator. [Check Cambridge.](#)

Imperial ESAT admissions tests

The Imperial department groups and module combinations recorded in our course navigator. [Check Imperial.](#)

UAT-UK test pages and 2027 course list

Official format and course routing. [ESAT format](#); [TMUA format](#); [2027 course list](#).

Requirements are time-specific. Check every exact course page again before registration. UniGenius is independent of the universities and UAT-UK.