T-LEVELS | Institute for Apprenticeships & Technical Education

Your guide to T Levels

Engineering and Manufacturing

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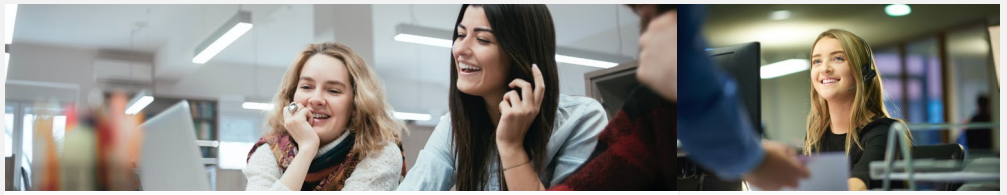
How do T Levels compare?

A Levels

Subject-based qualifications

two years
at local college or school



T Levels

2-year technical programmes at
Local colleges, schools, training providers
80% classroom based
20% in a placement

Includes **Industry Placements** to build attitudes and behaviours and to develop practical skills

Apprenticeship Level 2/3

at least 12 months
work-based training

80% on the job
20% off the job

Followed by possible progression to:

- Higher Education
- Employment
- Progression onto an Apprenticeship
- Higher / Degree Apprenticeship

How is a T Level different from an Apprenticeship?

	A Levels	T Levels	Apprenticeships
Qualification type	Academic	Technical	Technical
Duration	2 years	2 years	At least 12 months
Subject area	Multiple subjects	Single subject	Single subject
Learning environment	Classroom-based	80% classroom, 20% industry placement	80% work-based training, 20% off-the-job
How are they assessed?	Written exams and coursework	Written exams and work-based projects	Observations, written work and End Point Assessment
Age range	16+	16 -19 year olds	16+
Included in the UCAS tariff?	Yes, earn UCAS points	Yes, earn UCAS points	Depends on qualifications within the standard chosen
Entry requirements	Set by individual schools / colleges	Set by individual schools / colleges	Set by employer and / or by standard
Progression opportunities	Higher education	Higher education / skilled employment / accelerated or higher apprenticeship	Skilled employment / higher apprenticeship

T Levels and Apprenticeships are based on the same employer-designed standards but will suit different learning styles.

Apprenticeships are paid work, suitable for learners who know what occupation they want to pursue and wish to train ‘on the job’.

T Levels are largely classroom-based, with a substantive industry placement.

T Levels offer broader course content, and students will specialise later in their programme. The content of Apprenticeships is narrower and focused on a specific occupation from the outset.

T Level is the new ‘gold standard’ in technical education and the technical course of choice for learners in the future.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T Level programme composition

T Level courses include the following compulsory elements:

A Technical Qualification, which includes:

- **core theory, concepts and skills for an industry area**
- **specialist skills and knowledge for an occupation or career**
- **an industry placement with an employer**

The T Level is a full-time two-year programme.

UCAS tariff points will be allocated and will be equivalent in value to three A Levels.

Students will also be required to work towards the attainment of maths and English if they have not already achieved grade 4 at GCSE, as they do on other 16 to 19 programmes.

Core (680 GLH) / (1000 TQT)

50% Total TQ time

Graded	A* - E
Paper 1	Maths & Science
Paper 2	Engineering Concepts
ESP	Employer Set Project

Covers concepts and theories including core skills.

Occupational specialism (680 GLH) / (1000 TQT)

50% Total TQ time

Graded Pass/merit/distinction
Based on occupational maps

Covers practical skills and knowledge in a specialist occupational area.

Assessment:

External set exam and employer set project marked by C&G

Assessment:

Synoptic assignment external set and marked by centres and moderated by C&G

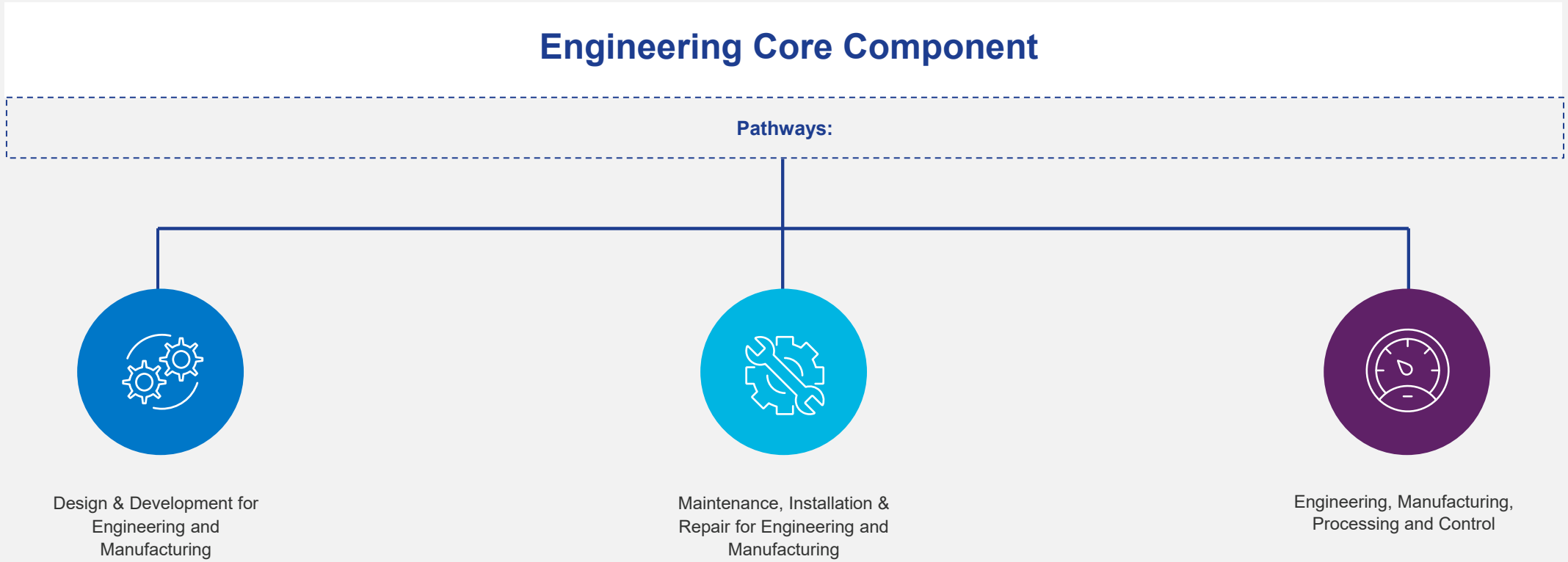
Industry Placement
315-420 hours
Min 45-60 days

Maths and English
GCSE or Functional Skills Level 2

(Continue to study as part of the condition of funding)

Tutorial- Employability enrichment, and pastoral hours

Technical Qualification overview for Engineering:



Learners must complete:

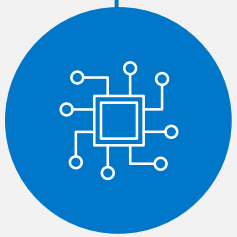
- Engineering Core
- 1 Occupational specialism within a pathway

Route: Engineering and Manufacturing

PATHWAY -Design and Development for Engineering & Manufacturing

Occupational Specialisms

Mechanical Engineering



Electrical & Electronic Engineering

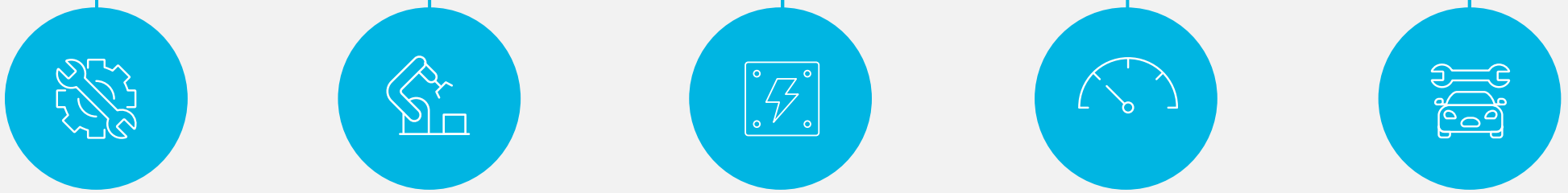
Control & Instrumentation Engineering

Structural Engineering

Route: Engineering and Manufacturing

PATHWAY - Maintenance, Installation and Repair for Engineering and Manufacturing

Occupational Specialisms



- Mechanical
- Mechatronic
- Electrical & Electronic
- Control & Instrumentation
- Light & Electric Vehicle

Route: Engineering and Manufacturing

PATHWAY – Engineering, Manufacturing, Processing and Control

Occupational Specialisms

Fitting & Assembly Technologies

Machining & Tool Making Technologies

Composites Manufacturing Technologies

Fabrication & Welding Technologies

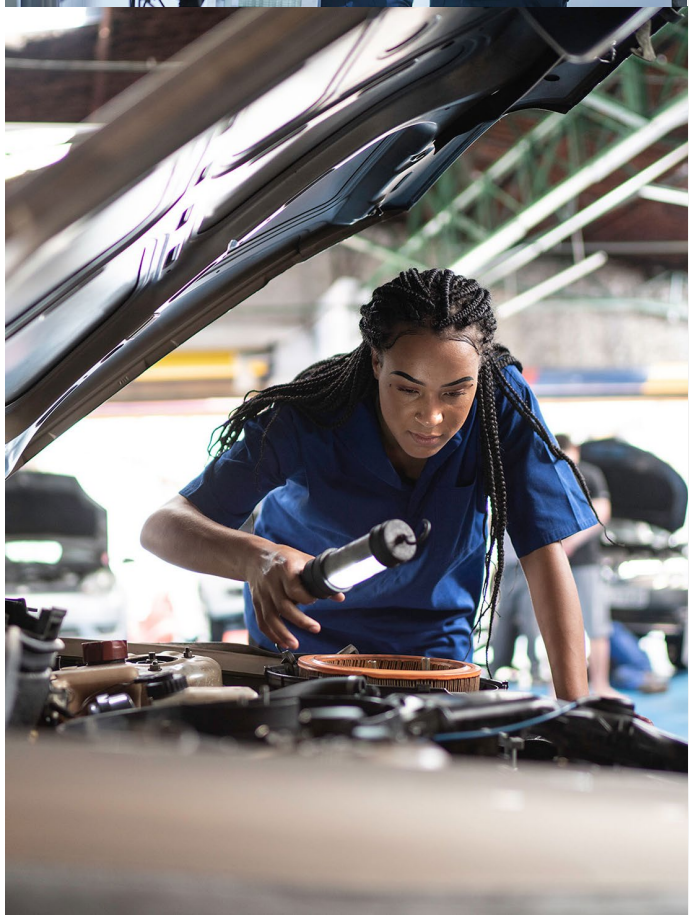
T Level Technical Qualifications

Maintenance, Installation and Repair for Engineering and Manufacturing	
8730 - 12	**Core**
8712 – 31	Mechanical
8712 – 32	Mechatronics
8712 – 33	Electrical & Electronics
8712 – 34	Control & Instrumentation
8712 – 35	Light & Electric Vehicles

Registration information: Core first before OS

Engineering, Manufacturing, Processing and Control	
8730 - 13	**Core**
8713 – 31	Fitting and Assembly Technologies
8713 – 32	Machining and Toolmaking Technologies
8713 – 33	Composites Manufacturing Technologies
8713 - 34	Fabrication and Welding Technologies

Design and Development for Engineering	
8730 – 14	**Core**
8714 – 31	Mechanical Engineering
8714 – 32	Electrical & Electronics Engineering
8714 – 33	Control & Instrumentation Engineering
8714 – 34	Structural Engineering



Guided Learning Hours

Core and Occupational Specialism content

Engineering and Manufacturing					
Design and Development		Maintenance, Installation and Repair		Manufacturing, Processing and Control	
Core Content (GLH)	Occupational Specialism (GLH)	Core Content (GLH)	Occupational Specialism (GLH)	Core Content (GLH)	Occupational Specialism (GLH)
680	680	680	680	680	680
1360		1360		1360	

Technical Qualification scheme of assessment components

Design & Development Pathway

Core component – Learners must complete all assessment components						
Assessment component	**Method**	**Duration**	**Marks**	**Weighting**	**Marking**	**Grading**
Exam paper 1	Externally set exam	2.5 hours	100	35%	Externally marked	This component will be awarded on the grade scale A* -E
Exam paper 2	Externally set exam	2.5 hours	100	35%	Externally marked	
Employer-set project	Externally set project	18.5 hours	90	30%	Externally marked	
Occupational Specialism Component – Learners must complete all assessment components						
Assessment component	**Method**	**Duration**	**Marks**	**Weighting**	**Marking**	**Grading**
Mechanical engineering	Externally set assignment	34 hours	90	100%	Externally moderated	All occupational specialism components will be awarded on the grade scale P,M,D
Electrical and electronic engineering	Externally set assignment	34 hours	90	100%	Externally moderated	
Control and instrumentation	Externally set assignment	34 hours	90	100%	Externally moderated	
Structural engineering	Externally set assignment	34 hours	90	100%	Externally moderated	

Technical Qualification scheme of assessment components

Maintenance, Installation and Repair Pathway

Core component – Learners must complete all assessment components						
Assessment component	**Method**	**Duration**	**Marks**	**Weighting**	**Marking**	**Grading**
Exam paper 1	Externally set exam	2.5 hours	100	35%	Externally marked	This component will be awarded on the grade scale A* -E
Exam paper 2	Externally set exam	2.5 hours	100	35%	Externally marked	
Employer-set project	Externally set project	12.5 hours	90	30%	Externally marked	
Occupational Specialism Component – Learners must complete all assessment components						
Assessment component	**Method**	**Duration**	**Marks**	**Weighting**	**Marking**	**Grading**
Maintenance engineering technologies: Mechanical	Externally set assignment	22 hours	90	100%	Externally moderated	All occupational specialism components will be awarded on the grade scale P,M,D
Maintenance engineering technologies: Mechatronic	Externally set assignment	22 hours	90	100%	Externally moderated	
Maintenance engineering technologies: Electrical and Electronic	Externally set assignment	22 hours	90	100%	Externally moderated	
Maintenance engineering technologies: Control and Instrumentation	Externally set assignment	22 hours	90	100%	Externally moderated	
Light and Electric Vehicles	Externally set assignment	22 hours	90	100%	Externally moderated	

Technical Qualification scheme of assessment components

Engineering, Manufacturing, Processing & Control Pathway

Core component – Learners must complete all assessment components

Assessment component	Method	Duration	Marks	Weighting	Marking	Grading
Exam paper 1	Externally set exam	2.5 hours	100	35%	Externally marked	This component will be awarded on the grade scale A* -E
Exam paper 2	Externally set exam	2.5 hours	100	35%	Externally marked	
Employer-set project	Externally set project	15.5 hours	90	30%	Externally marked	

Occupational Specialism Component – Learners must complete all assessment components

Assessment component	Method	Duration	Marks	Weighting	Marking	Grading
Fitting and assembly technologies	Externally set assignment	25 hours 15 minutes	90	100%	Externally moderated	All occupational specialism components will be awarded on the grade scale P,M,D
Machining and toolmaking technologies	Externally set assignment	25 hours 15 minutes	90	100%	Externally moderated	
Composites manufacturing technologies	Externally set assignment	24 hours 15 minutes	90	100%	Externally moderated	
Fabrication and welding technologies	Externally set assignment	26 hours 15 minutes	90	100%	Externally moderated	

Exemplar Core Examinations Paper 1 and 2

Paper 1 (Maths & Science)

Q1

The input into a gearbox is 300 revolutions per minute (rpm). The output from the gearbox is 2700 rpm. The gearbox contains two gears.

(a) Calculate the ratio of the input speed to the output speed. (1 mark)

(b) The output gear has 18 teeth. How many teeth will the input gear have? (1 mark)

Q1	Mark Scheme
	(a) 1:9 [1] - Do not accept marks for 9:1 (b) 9 × 18 = 162 teeth [1]
Total marks	2
AO	AO2 = 1 + 1
Qual spec reference	4.1

Paper 2 (Engineering concepts)

(b) The company currently inspects every machined part to ensure that it meets the requirements. Explain **three** potential implications for the company changing from 100% inspection to statistical process control for every machined part. (6 marks)

Q1 (b)	Mark Scheme
	One mark per implication and one mark per explanation of the implication to the company, up to a maximum of six marks. • Statistical Process Control takes less time and money to carry out (AO2) this could increase the profitability of the production for the company (AO3) • SPC could allow for immediate process adjustments to identified issues by operators (AO2) this would result in fewer parts being produced and scrapped for faults reducing the cost per machine part (AO3) • There is a statistical risk that defects would not be detected without 100% inspection compounding quality issues through the manufacturing stages (AO2) this could result in reputational damage and reduce sales where quality is important (AO3) Credit other suitable responses.
Total marks	6
AO	AO2 = 3 AO3 = 3
Qual spec reference	11.1

Exemplar Employer Set Project

Design specification

Performance requirements for the bollard

Train express Limited wish to develop a bespoke bollard to be sites in public realm spaces outside their stations across the UK (Refer to Photograph 1). The company wish to “re-engineer’ the standard self-righting internally illuminated bollard (refer to Photograph 2) used frequently in streetscapes across the UK. The new bollard is also required to monitor the number of people using a station and should be energy efficient. The specific performance requirements of the bollard are:

- The bollard shall have an overall height of 1000mm and width of 300mm.
- Each bollard needs to be able to sustain an impact loading from a vehicle. The force applied to the barrier should be calculated in accordance with BS EN 1991-1-1-1:2002 (Refer totable 1)
- The bollard is to be manufactured from a recycled or sustainable material.
- The bollard is t be fitted with technology that is able to count human presence.
- The bollard is to be lit by a low energy lighting source.
- The bollard is to have an internal light source like the original, which ensures that it is highly conspicuous from all sides.
- The overall aesthetic design of the bollard is to be modern and reflect intended sitting outside a railway station.
- The bollard shell should be able to withstand a minor vehicle impact and be easily replaceable.
- Train Express Limited wish to limit or eliminate any mains power source to the bollard.
- The bollard should be designed as far as possible to be vandal proof.

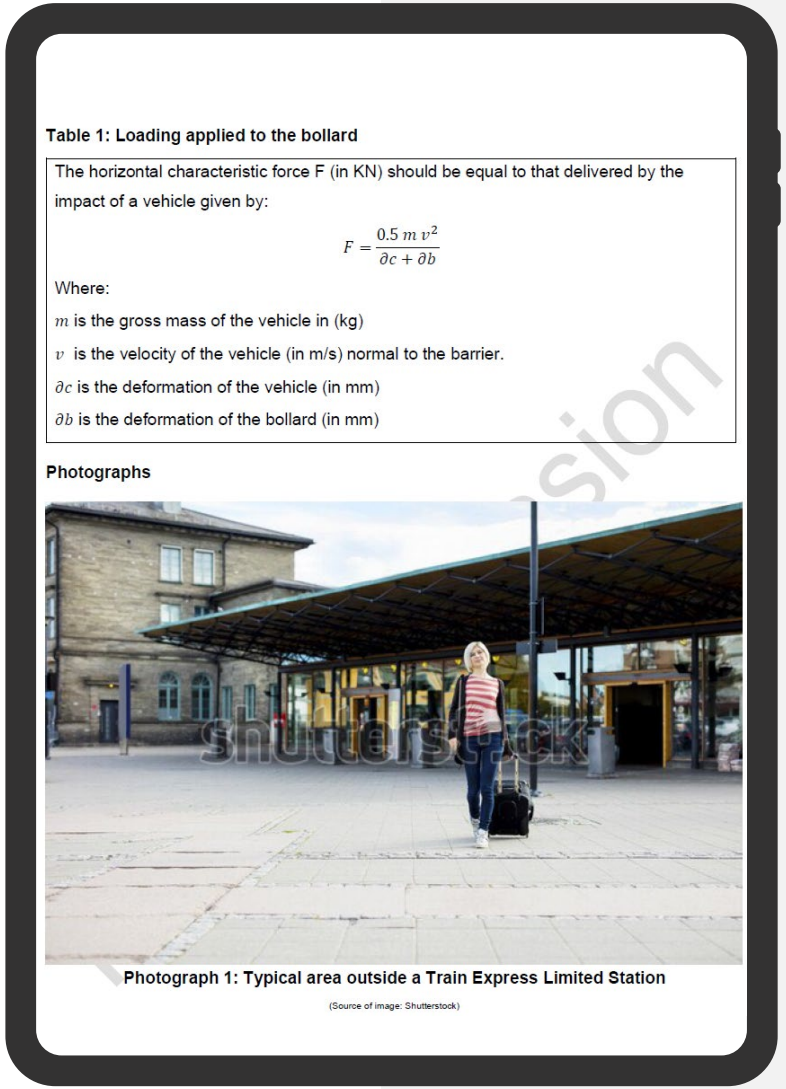


Table 1: Loading applied to the bollard

The horizontal characteristic force F (in KN) should be equal to that delivered by the impact of a vehicle given by:

$$F = \frac{0.5\, m\, v^2}{\partial c + \partial b}$$

Where:

m is the gross mass of the vehicle in (kg)

v is the velocity of the vehicle (in m/s) normal to the barrier.

∂c is the deformation of the vehicle (in mm)

∂b is the deformation of the bollard (in mm)

Photographs

Photograph 1: Typical area outside a Train Express Limited Station

(Source of image: Shutterstock)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Industry Placement

Every T Level includes an industry placement with an employer focused on developing the practical and technical skills required for the occupation. These will last a minimum of 315 hours (approximately 45 days) but can last longer.

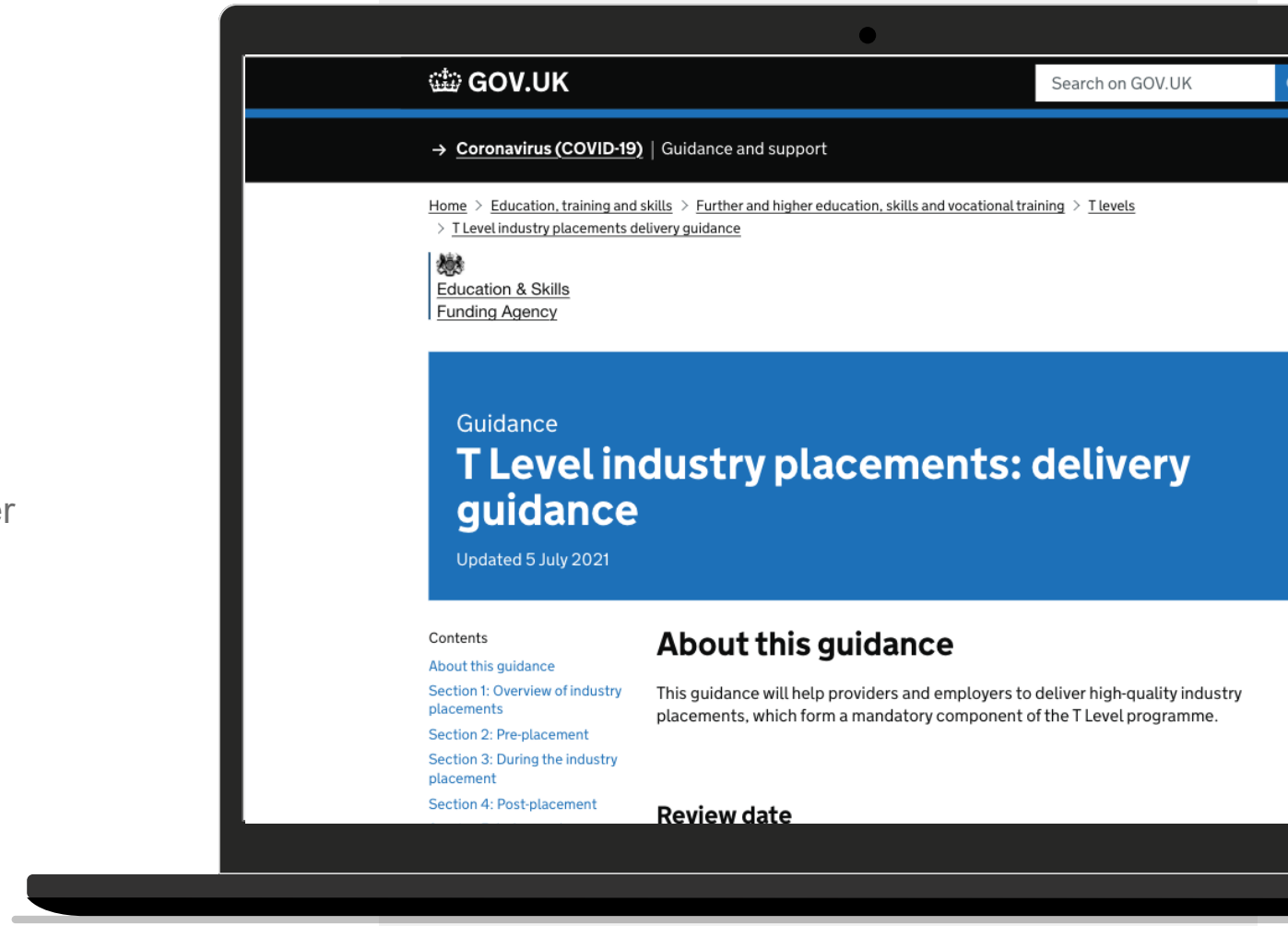
Providers will ensure learners have an industry placement and will support employers offering industry placements.

This will include assistance with the necessary paperwork, a careful planning process and support with designing the industry placement.

The Education and Skills Funding Agency (ESFA) and National Apprenticeship Service (part of ESFA) are working with employers and providers on industry placements.

So, what are industry placements?

- Time spent learning and working within an organisation
- Making a meaningful contribution within that organisation
- Occupationally-specific – developing practical and technical skills in the subject the student is studying
- A requirement for all T Level learners from September 2020 and, for learners on other vocational programmes
- Employers can offer industry placements as a block, day release or a mix of these, and can discuss sharing part of the placement with another employer if necessary.



Take a look at Government guidelines here

Useful tips for providers to look for within a placement

Does the employer and placement……

- offer a safe working environment
- incorporate an induction
- offer relevant tasks and projects for students that will help them learn the knowledge and skills
- offer appropriate equipment and resources
- provide a mentor or supervisor which can support the student
- ensure a review procedure is in place (for both the learner and the provider)
- If successful can this placement be used again?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HE Engagement

- Formed an HE representative group to review and validate the content of the T Level assessments.
- Positive feedback from all members of the HE Group who see the Engineering & Manufacturing T Level as a viable route into HE.
- Produced an HE guide for universities and admissions with detailed information on the potential progression routes and degree opportunities from a T Level.
- Worked with universities for suggested entry requirements based on the overall T Level grade in comparison to other alternative vocational qualifications.
- Working with University of Vocational Awards Council (UVAC) to gain support from universities which has over 80 members including Russell Group Universities.
- Publishing a list of all HEPs who are accepting applications for 2024 cycle.

T Level Progression Routes – current thinking

ROUTE: ENGINEERING AND MANUFACTURING			
Pathway	**Occupational Specialism**	**Apprenticeship or Higher Ed**	**Level**
Design and Development for Engineering and Manufacturing	Mechanical Engineering	Engineering Design & Draughtsperson	Level 3
		BEng (Hons) Mechanical Engineering (Foundation Year)	Level 5
		BEng (Hons) Mechanical Engineering	Level 6
		BEng (Hons) Aerospace Technology	Level 6
	Electrical & Electronic Engineering	Engineering Design & Draughtsperson	Level 3
		BEng (Hons) Electrical/Electronic Engineering (Foundation Year)	Level 5
		BEng (Hons) Electrical/Electronic Engineering	Level 6
	Control & Instrumentation Engineering	Engineering Design & Draughtsperson	Level 3
		Automation & Controls Engineering Technician	Level 4
	Structural Engineering	Engineering Design & Draughtsperson	Level 3
		Engineer Surveyor	Level 4
		BEng (Hons) Civil Engineering (Foundation Year)	Level 5
		BEng (Hons) Civil Engineering (Foundation Year)	Level 6

T Level Progression Routes – current thinking

ROUTE: ENGINEERING AND MANUFACTURING			
Pathway	**Occupational Specialism**	**Apprenticeship or Higher Ed**	**Level**
Maintenance, Installation & Repair for Engineering and Manufacturing	Mechanical	Maintenance & Operations Engineering Technician (MOET)	Level 3
		BEng (Hons) Mechanical Engineering (Foundation Year)	Level 5
		BEng (Hons) Mechanical Engineering	Level 6
		BEng (Hons) Aerospace Technology	Level 6
	Mechatronic	Lift & Escalator Electro mechanic	Level 3
		Engineering Technician	Level 3
		Automation & Controls Engineering Technician	Level 4
	Electrical & Electronic	Maintenance & Operations Engineering Technician (MOET)	Level 3
		BEng (Hons) Electrical/Electronic Engineering (Foundation Year)	Level 5
		BEng (Hons) Electrical/Electronic Engineering	Level 6
	Control & Instrumentation	Automation & Controls Engineering Technician	Level 4
	Light & Electric Vehicle	Vehicle damage mechanical, electrical and trim (MET) Technician	Level 3
		Accident Repair Technician	Level 3
		Motor Vehicle Service & Maintenance Technician (Light Vehicle)	Level 3

T Level Progression Routes – current thinking

ROUTE: ENGINEERING AND MANUFACTURING			
Pathway	**Occupational Specialism**	**Apprenticeship or Higher Ed**	**Level**
Engineering, Manufacturing, Processing and Control	Fabrication and Welding	Metal Fabricator	Level 3
		Plate/Pipe Welder	Level 3
		Non-Destructive Testing Engineering Technician	Level 3
	Composites Manufacturing	Engineering Technician	Level 3
		Engineering Manufacturing Technician	Level 4
	Production Fitting & Assembly	Engineering Fitter	Level 3
		Engineering Technician	Level 3
	Machining & Toolmaking	Engineering Technician	Level 3


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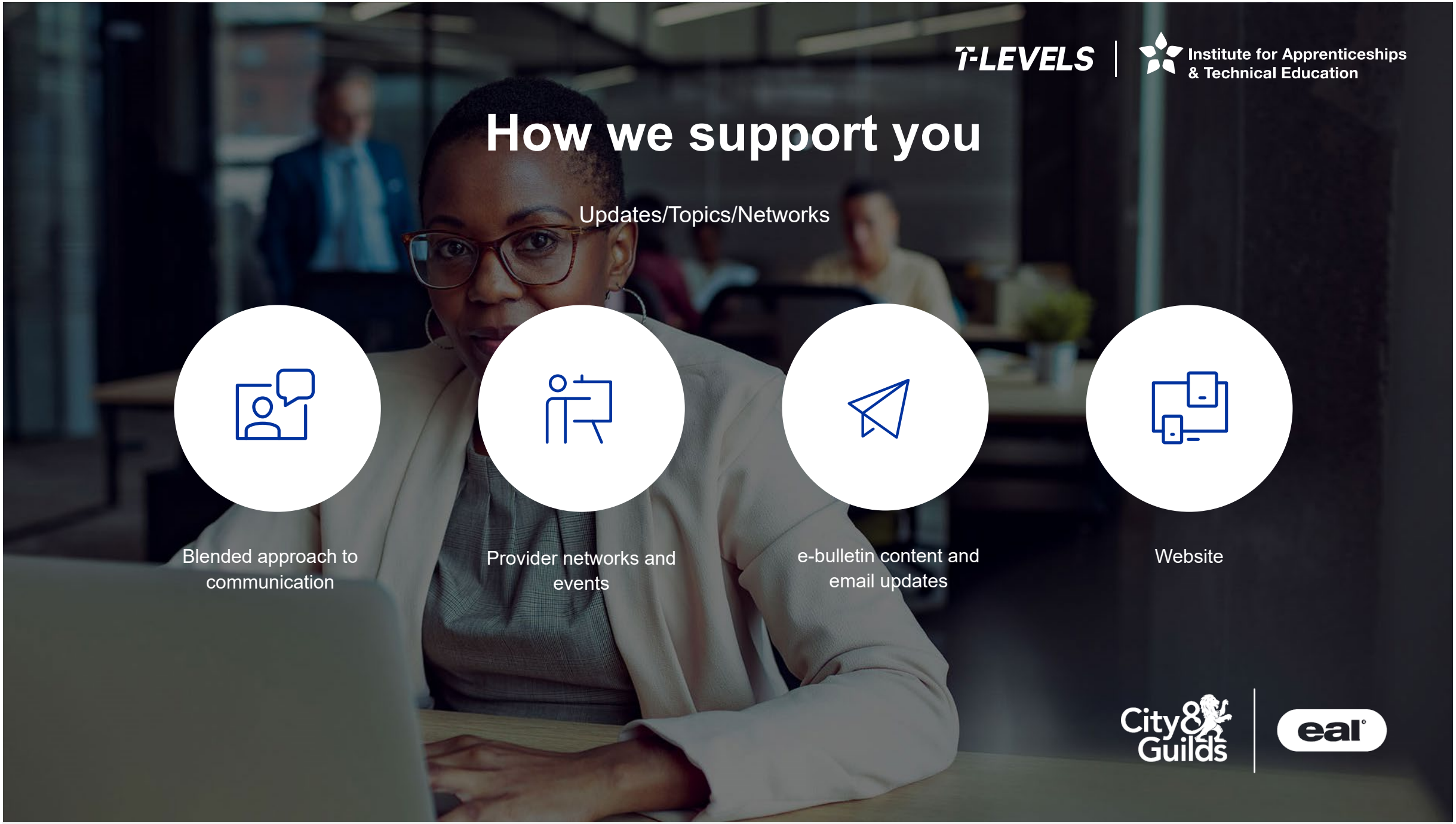


How we support you

Updates/Topics/Networks

Blended approach to communication

Provider networks and events

e-bulletin content and email updates

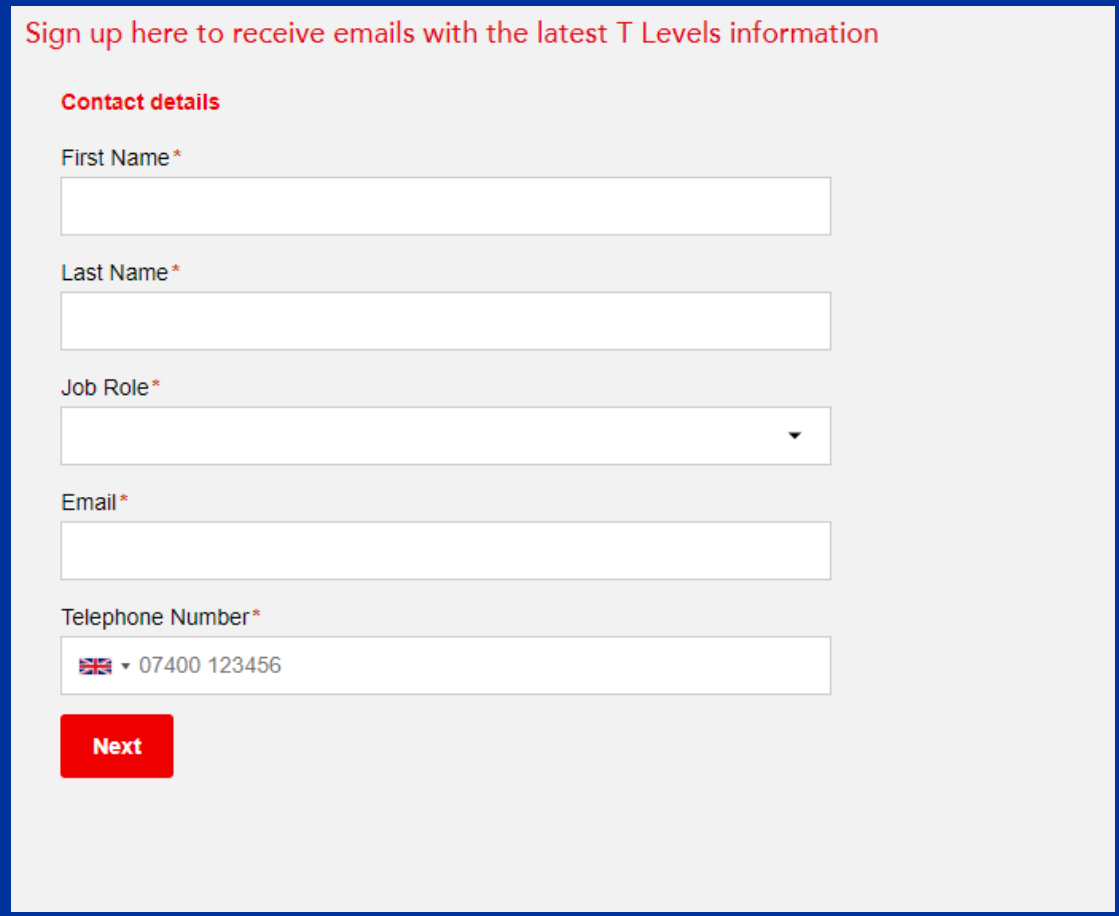
Website

Don’t miss out…

Sign-up for T Level information

To ensure you receive all the latest information and updates regarding the TQs including our events, networks and webinars sign up via the link below adding your details into the relevant areas on the webpage.

cityandguilds.com/tlevels/engineering



Get involved and make a difference

Employer Industry Board (EIB)

We have a quarterly meeting with all panel members to discuss industry matters. Some of these can include; apprenticeships, FE, HE, T Levels, new developments (standards, qualifications), new technology AOB.

TQA Associates:

- Principal Moderators / Moderators
  Ensure a standardised and consistent approach to quality assurance, moderation, feedback and processes
- Technical Qualification Associates (TQAs)
  Review Eligible Provider approval applications, including supplementary evidence and carry out approval and support activities.

Marking Examiners

Mark candidates' scripts/evidence in accordance with the agreed marking scheme/criteria within the agreed timescale