

### **Engineering and Manufacturing**

The National T Level Conference

26<sup>th</sup> June 2024

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#### Agenda

- Introduction & Context
- Industry perspective on T Levels with Engineering UK
- Delivering Engineering & Manufacturing T Levels with UTC Leeds and York College
- Awarding Body Update City & Guilds
- Case Study: Working with the MoD
- Your Perspective
- Close



### Activity

#### The National T Level Conference

26<sup>th</sup> June 2024

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### Industry perspective of T Levels Engineering UK

The National T Level Conference

26<sup>th</sup> June 2024

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T Levels: a vital pathway for young people to access the engineering and technology careers of the future





### **Rebecca Healy**

**Careers Inspiration Manager** 



- Our Mission, Vision and Purpose
- The latest sector insights
- The importance of T Levels in securing the future workforce needed for the UK to thrive
- How T Levels can support young people (including those from underrepresented groups) in accessing diverse and fulfilling future careers in engineering and technology
- How T Level skills development can facilitate an equitable approach to career readiness with young people

### **OUR PURPOSE**

To drive change so more young people choose engineering and technology careers



### OUR MISSION

EngineeringUK will enable more young people from all backgrounds to be informed, inspired and progress into engineering and technology





### OUR VISION

The UK has the diverse workforce needed for engineering and technology to thrive and to drive economic prosperity, improve sustainability and achieve net zero



### What engineering skills will we need in the future?

Demand for engineering skills is soaring across all sectors





Engineering jobs to grow in all UK regions between **now and 2030 – faster than other occupations** 



Up to **725k new jobs** needed **by 2030** to support transition to net zero



**25% of all job postings in UK** are for engineering roles

'Green' engineering jobs are on the increase - a trend likely to continue



Employers report skills shortages and recruitment challenges



**Engineering skills needed in all sectors** from creative digital and big data to advanced manufacturing and rail transport

#### Where in the UK are skills needed?

Different UK regions have unique strengths and specialisms

> Skilled trades, industrial and general operative roles are most specialised to North of England, Wales and Northern Ireland





**Scotland** has a very high degree of specialisation in environment, energy and earth occupations

The South and Midlands have a focus on mechanical and electrical

London and South East specialise in ICT and civil engineering roles



### Why is a diverse workforce important?

Diversity in the workplace benefits everyone



#### A more diverse workforce



improves innovation, productivity, resilience, marketing insight and creativity



addresses skills shortages and drives social mobility



gives more young people the chance of fulfilling, rewarding careers



creates a wider range of beneficiaries for engineering and technology innovations

### T Levels - Securing the future workforce needed for the UK to thrive





Tea cups and T Levels Learn more about what it's like doing a T level at Portmeirion, and the engineering behind making pottery.

**UK engineering businesses are seeking a diverse workforce** and are actively recruiting people who can offer experiences and ideas that **reflect the population's diversity**.

T levels have potential to deliver and empower a skilled engineering and technology workforce to meet the need of British industry. T Levels are an innovative, industry-supported approach to skills training.

Engineering and technology sector requires more specialised skills on average than other professions and T Levels are designed to prepare new entrants for employment and professions. T Levels students transition into the labour market ready with skills and the practical experience along with relationships with employers and communities that they need to succeed.



### What difference does outreach make?

Young people need to know what roles are available, be attracted to them, and understand the routes into engineering and technology

Taking part in STEM careers activities boosts young people's knowledge of and interest in engineering and technology careers

School students who attend one or more STEM careers activity are:

#### 3.5 times

More likely to know what people working in engineering do.

#### 3.4 times

More likely to consider a career in engineering.





Now

Why is engineering outreach important?

Building the workforce to improve sustainability and achieve net zero



We surveyed young people:

#### 70% of young people

said 'engineers are important for improving the environment'.

Young people who agreed that 'engineers are important for improving the environment' were almost

#### 7 times more likely

to be interested in a career that involves engineering than those who did not agree.

### **T Levels - supporting young** people in accessing diverse and fulfilling future careers in engineering and technology



How can T Levels prepare me for a career in engineering and technology?

- Over half of all T Levels on offer are in engineering and technology subjects
- From engineering and manufacturing to digital, construction and science, there are a range of subjects to explore - with more being launched soon, including creative and design
- There are many different types of jobs and career pathways in engineering and technology. A T Level could provide you with highly transferable technical skills and knowledge, which you could use in a future career that you love

#### What now?

Download this guide to help you understand more about the different routes into engineering: www.neonfutures.org.uk/ all-routes





# Bridging outreach and driving inclusivity

Through the Provider Access Legislation equity of promotion of both academic and technical education pathways can occur which is critically important when the majority (63%) of young people did not know what T Levels were at all.

T Levels have the potential to provide the solution to solving employers vocational pipeline issues, with 55% open to taking on an industry placement in the future.



The elements of science learning that young people have said they find inspiring are evident in T Level study, including:

- Doing practical work 52%
- Relevant to real life 25%
- Fits with future study or career plans 20%

Practical work and having a good teacher are more important for girls. Liking the subject is more important for boys.

## Demystifying the progression pathways

#### Utilise skills as a shared language and create case studies

to build employers and learners understanding about the skills connections between the qualification, the needs and benefit of the placement and the progression path opportunities..

EngineeringUK

A T Level opens up the possibility of doing a 'green' job in the future that supports environmental sustainability and helps us tackle climate change and achieve net zero carbon emissions.

Use the occupational maps to explore green jobs: https://occupational-maps.instituteforapprenticeships.org/

Tip: Look out for the T Level and Green Role icons.

Some roles may be accessed immediately after completing a T Level, others are available following further training and experience.



hello@neonfutures.org.uk

### **Provider Access Legislation 2023**

Utilise PAL to create outreach opportunities that demonstrate the relevance of T Levels to young people's future employment

#### **Bringing Skills relevance to life**

Engage your placement providers to partner in your outreach, get them to:

- explain the relevance of skills to the learning the young people will undertake
- and the professional pathways following a T Level.





Schools must allow providers to have a reasonable amount of time, during the standard school day to meet the pupils and to provide all pupils with 'career-focussed' experiences

### Skills development can facilitate an equitable approach to career readiness with young people



- Teamwork
- Speaking
- Listening
- Problem solving
- Creativity



Engineering skills are highly transferable and will always be in demand.

As an engineer, you use:

Creativity

B Teamwork

Open-mindedness

Social conscience

Communication

🕅 Determination

Problem-finding and solving

Innovation



### **CEC Employer Standards**

#### **Careers readiness through Careers Education**



Build essential skills and explain their relevance Build and develop skills with relevance
Practice through careers education activities and opportunities
Reflect on the importance of skills
Explain the skill value in the workplace





How to use skills in the application process
Develop the capability to describe and demonstrate skills and experience e.g: professional persona and careers opportunities

## Engineering skills needs – now and into the future

#### **Skills snapshots**

Utilise the Skills snapshots to bring labour market insights to life with young people.

- Top occupations
- Top 10 software skills
- Top 15 specialist skills
- Key job postings
- Key labour force figures





Civil **Design and development Electrical** Environment, energy and earth ICT and software Industrial Mechanical Other engineering Other operatives Quality assurance and regulatory **Skilled construction trades Skilled metal trades** Waste, air and water



#### **Future and Green Careers**

- Creating harvesting robots
- Making recyclable wind turbine blades
- Developing biofuels and electric aircraft
- Using AI to improve automated waste sorting
- Planning vertical and floating (space-saving) farms
- Designing AI powered sensors to detect pollution levels
- Creating shark-inspired 'skins' for planes to reduce fuel use





#### Links to popular resources

'From Idea to Career' and 'All routes into engineering' booklets and the 'T Level Explorer' leaflet

6 themed postcards and posters based on UN Sustainable Development Goals showing how engineers transform the way we travel, eat, use, power things, build and breathe.







### **New resource launching!**

#### A new careers resource available for FREE on Neon.

Aimed at 14-16 year-olds and their parents/carers, this new 4-page leaflet describes what the jobs of the future will be. Covering topics like:

Aroune

- What do engineers do? ٠
- Where will the jobs be? ٠
- Which subjects will help keep options ٠ open for a career in engineering?
- What skills will be needed in the future? ٠











engineeringuk



in

\_EngineeringUK



Neon helps primary and secondary teachers introduce their students to future STEM careers, raise their aspirations and explore the excitement of engineering and technology through brilliant activities, inspiring case studies and supportive resources.



- **Experiences**
- **Case Studies**

**Resources** 

- View **collections** which bring together a suite of inspiring experiences and resources that you could utilise in your careers programmes.
- **Challenging Perceptions**
- Green careers in engineering and technology
- Boost your students sense of achievement
- Anyone can browse Neon but registering with us means you can unlock key info and features, including saving your favourites.



### Improving access

- Motivate your students
- Inspiration for teachers
- Financial support/bursaries
- Real life stories
- Inspire your students
- Learn from other teachers
- Employer engagement



will see exclusive content on the 'Improving access' tab Motivate your students Inspiration for teachers Financial support Real life stories Inspire your students Learn from other teachers Employer engagement **Motivate your students** Use these resources to get your students excited about engineering careers, all the different areas it covers and and the different routes they could take to get into engineering. From idea to All routes into **Engineering in IET Posters and** school engineering career packs career A guide to 12 different A 20-page booklet for young STEM Learning resources The Institution of Engineering engineering disciplines people in the UK who are which bring engineering into and Technology posters and your secondary school or making decisions about their career packs can be ordered showing different pathways into engineering, to support next steps, and the different college. free of charge, or downloaded students with their career routes into the sector. and printed. Engineering in school decision-making. All routes into engineering **Posters and career packs** From Idea to career

Registered teachers and Careers Leaders from our priority schools

## Some different areas of Engineering

- General engineering
- Aerospace and aeronautical
- Biomedical
- Chemical
- Civil and structural
- Electrical and electronic







#### ACADEMIC Putting carbon in its place

Ifeoma works as a soil scientist at UNDO, a company working to remove carbon from the atmosphere with the help of enhanced rock weathering.





ACADEMIC

**Building** a



From idea

- Marine
- Materials and waste recycling
- Mechanical
- Production and manufacturing
- Software engineering and computing





### Delivering Engineering & Manufacturing T Levels

The National T Level Conference

26<sup>th</sup> June 2024

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## Delivering Engineering & Manufacturing T Levels

**Richard Nash** 

**Director of Engineering** 

UTC Leigh

Lisa Wheeler

Head of Curriculum for Engineering & Digital Technology

York College

#### **T Level Engineering at the Leigh UTC**



#### A little about the options - Specialism



When marketing to parents we explained the skill shortages, especially locally, good combination of academic rigour and vocational. Still go to University but also experience work related learning through the course. The CORE teaching allows other career paths.

#### **Initial Curriculum Model**



#### **Current Curriculum Model**



#### **Considered Curriculum Models**


### **Considered Curriculum Models**



Adv. Students even more mature in June Y13 - can embed OS and Core more seamlessly Disadv. Keeping Maths / Science teachers. Students undertaking OS and CORE exams close together. No retakes.

Core +

OS =

Grade

D/M/P

## How have we found our student experience differs?

#### **Enhanced Pastoral Support:**

- More pastoral staff within the department.
- Provides a clearer overview of student progress and issues.

#### **Diverse Weekly Curriculum:**

- Varied subjects each week.
- All subjects are framed within an engineering context, making them relatable to students.
- Mix of academic and vocational learning.

#### **Project-Based Learning:**

- Theory is integrated into projects.
- Retained many BTEC projects and trips as vehicles for teaching curriculum content.

#### Simplified Grading System:

- Transition from multiple grades to a single reporting grade.
- Current reports use teacher unit grades.

#### **Extended Learning Opportunities:**

- Introduction of CORE Maths and EPQ.
- Designed to enhance learning experiences.
- Note: Not mandatory for all students.

#### **Consistent Teaching Resources:**

- Unified approach across subjects.
- Common resources include:
  - Example teaching slides.
  - Worksheets and answers.
  - Multiple-choice questions.
- Dedicated classrooms for each teacher..

- Exam-based assessment is a different challenge compared to project/unit-based assessment.
- Learning must be revisited more regularly; 17 separate units in 9 months after GCSEs can be overwhelming.
- More opportunities to take risks with learning.
- The specialism exists in Year 2; integrate it into Year 1.
- The specialism may start immediately after the Core summer exams.

### Examples:

- Develop CAD and fabrication skills: students design and make a barbecue project through the EPQ route, providing real clients.
- In preparation for the Employer Set Project, students practice making what they design, leading to deeper learning (e.g., articulated vice project).
- Electronics challenge related to a visit to Thames Water.



Give a practical outlet Understanding manufacture. helped them better understand design needs.

#### Team Project

All students had a brief and clients for feedback and had to present! We actually used a slimmed down EPQ format.



## Example project based learning Barbeque designs - Fabrication



How did this support the CORE?

Research techniques and CAD were taught for ESP.

Unit 12 Health and Safety, Unit 17 Project management,

Some of Unit 14 Human Factors,







This was a good opportunity to develop their CAD skills for the ESP and produce dimensioned drawings to work from for their OS.













The vice was a focussed task to support OS and teach secondary machining

The articulation design was a practice for ESP. Fully set as a mock exam using the full mark scheme!



Articulated vice project for practice Employer Set project



They then manufactured the articulated part from their Dimensioned CAD drawings.

This was assessed using specific criteria from the OS assessment - good use of Module 6!.

## **Specialist equipment funding**

- Spend wisely; consider the curriculum impact, not a "sweetshop" approach.
- Ensure extra student funding is allocated to the department. This course is expensive, especially with higher demands on equipment and resources, and should be reflected in the budget.
- Collaborate with partners, including existing suppliers, universities, and local employers, to secure good deals and determine the best equipment.
- Investment benefits the wider school (e.g., DT, KS3 and 4, even KS2), apprentices, maths and science departments, and local companies due to industry-standard equipment specifications.
- Secure longer licenses or service periods upfront to ensure long-term benefits.
- Other funding is available for large projects.
- \*\*\*Cost claims for work placement providers may be ending.\*\*\*

## Work experience

Is definitely a challenge - be prepared for that but relish it! We opted for:

- 5 days of work related preparedness/ virtual work experience.
- 20 days after the exams in June. (4 week block)
- 20 days in Y13 this is more flexible due to longer project timescales. (Some partners could offer 2 blocks in Y13)

We now opt for:

- All 45 days Work placements
- Mod 2 of Y13 3-4 weeks increases workshop space for Y11 assessments and other projects. Can use Mod 6 of Y12 to increase workshop access.
- Then make up the rest however companies can offer depending on potential disruption to curriculum.

Other models include:

- Continue through the summer holidays to complete all in first year.
- Day release We have no Post 16 in on Wednesdays!
- One large block early in Year 13!

## **Develop partnerships for work placements – schmoozing them**

Breakfast /

Mentoring.

coffee!



Popped in, in person - express an interest in looking at what they do!



Student showed enthusiasm and knowledge!



Asked about doing a short tour for our students! Unit 11 Quality and 16 **Continuous Improvement** 



Impressed at what we offer and now we have several students who are placed there and since employed!

### **Delivery approach across the year for the OS**

- Our successful approach involved leveraging staff strengths to design projects that met the annual criteria requirements.
- To ensure student progression, we divided the final assessment criteria among staff members. Each teacher focused on specific criteria throughout the year, with each criterion being assessed multiple times by different teachers.
- For example, 'Inspection Techniques' was assessed multiple times by one teacher and then reassessed by another, allowing for focused assessments and clearer progression tracking.
- As the OS approached, we conducted a comprehensive 'mock' style project to prepare students.
- We also used Google Docs for observation records, incorporating live photographic evidence and notes.

## Some issues in delivering the OS

- Difficult for staff to meet often, leading to isolation. Regular meeting slots are essential for your team with T Levels.
- T Levels require significant resources. Balancing time was challenging with two T Level classes in Year 12 and Year 13, alongside BTEC Level 3 and Level 2 Engineering. Workshop time for other classes was impacted for up to six weeks.
- In-house assessment is challenging and labor-intensive. Photographic evidence, commentary, and writing up CRFs are demanding tasks.
- One way to reduce this was using Google Docs, created for students in advance, allowing us to take photos with our phones and type brief observation notes directly into the document.
- Plan ahead for potential resource clashes with students and ensure their are options eg complete the CNC activity if a mill is in use. Less students in, the easy it is to plan and assess.
- Ensure you build in time to edit commentary, update CRFs, and moderate (if more than one assessor) as you go. Include this in your schedule.
- Ensure you have suppliers ready to get equipment or materials available quickly from getting the resource requirements lists and can get orders through finance.

### **Benefits of Industry links and some issues**

- Increased Industry Visit Opportunities
- Some employers now prefer to employ or take on apprentices exclusively from us.
- Funding from our partners.
- Increased business mentoring.
- Technical support with equipment and machinery.
- Work-related learning/projects.
- What students learn, they see in real-world applications!
- Work experience selection process provides valuable experience for students.

## **Benefits of Industry links and some issues**

#### • Awareness Challenge:

- Many companies are unfamiliar with T Levels.
- Your role: Educate and advocate for T Levels.

#### • Simplifying Placements:

- Companies perceive placements as complicated. reduce their visual overload.
- Gradual engagement:
  - Initial meet-ups: visits, coffee, business breakfast (everyone loves a free bacon roll or veggie sausage bap!).
  - Invite them in for non-committal mentoring.
- Goal: Ease them into the process, ensuring they feel comfortable and committed.

#### • Company Progression Post T Level:

- Companies appreciate T Levels but face limited Level 4 (L4) providers, especially for specific routes.
- Action: Conduct research to identify and address gaps.

#### • Structured Placement Management:

- Plan for pre-placement, during placement, and post-placement activities. Incorporate this into the weekly timetable.
- Ensure teacher involvement, even if it's not a teaching role.

#### • Support for Employers:

- Acknowledge the significant commitment required from employers.
- Aim to ease their burden and provide support wherever possible.
- Ensure the right candidates are placed in the right companies. 'Some can be a try before you buy!'







#### NOTES

-MATERIAL: MILD STEEL & GALVANISED

FEFER TO DRAWING HH-2015-P-03 FOR LOCATIONS OF POSTS.

SEE DRAWING NUMBER HH-2015-S-10 WHICH SHOWS SECTION THROUGH PARAPET

ALL WELDS TO BE GMM FILLET WELDS UNLESS NOTED OTHERWISE ALL VISIBLE WELDS TO HEAT

QUANTITY - 43 NO REQUIPED

An example of company based assignment to determine potential candidates.

Example CAD work experience selection process

Note: Change this feature from two holes to one slot.

## Site Visits - Examples of Engineering projects backed up by site visits





Visiting Thames water and seeing their Storm tank overflow systems.

Unit 9 Mechatronics



In teams students then had to replicate and solve the problem through differing levels of challenge. 1 testing station but each had a tester board and breadboard.







Visit to military site to see their bomb disposal robots Unit 9 Mechatronics and Unit 10 Engineering and manufacturing control systems



















Original



Putting it into practice back at the Leigh UTC - teamwork project



Climbing the stairs challenge

> Cutting a wire challenge



### Some feedback from first round

- No constraints be willing to keep trying different things!
- It's a different mindset to other subjects in the school ensure your SLT are aware of this and budget, staffing, exam periods and timetabling implications.
- Need a dedicated person driving work experience but more important to involve your engineering experienced teachers.
- Baseline assessment know your students early
- More regular assessment.
- Be quite strict with your entry requirements and student suitability
- Provide lots of opportunities for the specialism to filter into Y1 including practical opportunities
- Don't be afraid to take risks!



# T Level Engineering and Manufacturing **Design and Development**

T Level Conference : 26/6/2024

## **York College :** *our experience*

Lisa Wheeler : Head of Curriculum Engineering & Digital Technologies







## Sharing's caring ...



....comes from a place of collaboration

....l'm no expert

IN

....really keen to know what other centres are trying



... what works for one centre ....etc.

AMBITION

RESPEC

CARE

SUCCESS



## We'll look at ...

- Our bigger picture ... to give you some context
- Year 1 planning : Core & ESP & things learnt
- Year 2 planning : Occupational Specialism

CΔRF

- Occupational Specialism
  - Preparation
  - Exam Experience
  - Things learnt



## Bigger picture ...

- 600+ students & apprentices, 38 staff
- Engineering : EAL programmes / Level 3 BTECs /HNC&D / A Level etc.
- Resources & environments IoT & T Level funding
- Work Placement Team for finding T Level placements and Reviewer for visits
- Sept 2022-24 T Level : 12 .. now 7
- Sept 2023-25 T Level : 16 .. now 15
- Full cycle but small numbers
- Still have BTEC AME + T Level in parallel 2025

CARF

• Forecasting 45 in 2026

AMBITION

RESPEC



## Initial Year 1 planning ... Core & ESP

### 4 day week - 4 x 1.5 hr lessons inc. tutorial (11 lessons)

- 17 core modules allocated to 7 specialist tutors\*
- ESP preparation from day 1 March attempt
- CAD Skills : Solidworks
- Practical general workshop skills
- Work placement preparation (tutorial)



Mocks – for core & ESP

### Work Placement : 315 hrs / 42 days

- 1 day per week post Easter of year 1
- 4 week block after the core 2 exam
- 1 day per week from Sept in Year 2 until complete

CARF



## Year 1 : Core : **development points** for us...

• Sequencing !

Increased ESP delivery time & moved some smaller modules post ESP exam

Increased CAD skills development

- Delivery team reduced
- Team training whole picture ESP in particular
- Further TLA/Pedagogy preparing students for exams

CARF

- Reviewing holistic homework strategy / monitoring progress
- Tutorial : more work placement preparation activities; closer liaison with the work placement team

ESP Presentations : honed process



## Year 2 : Occ Spec (Mechanical)

4 day week - 4 x 1.5 hr lessons inc. tutorial (11 lessons)

- Holistic planning : project-based delivery : BRAVE
- Each project designed to cover different spec elements Materials, tools & equipment, assembly/ joining methods mechanical devices etc.
- Each project repeatedly covering the skills development for Task 1,2,3 & 4 for the OS *practice, practice, practice*
- Project assessment & feedback in line with the 4 x OS tasks and marking criteria / grid
- 7 specialist tutors \*
- Resource : dedicated T Level CAD suite & adjacent multipurpose workshop (also used for the OS exam) – but didn't start with this
- Mocks

CARF



## Year 2 : Occ Spec (Mechanical) continued

- Key challenges of the holistic approach : planning, responsibility, communication & tutor skill set
- Reactively had to add some delivery of topics / theory 'in year'
- Added more CAD lessons & practice 'in year'

Projects included ...

- Mechanical Coin Sorter
- A3 drawing board & square
- Adjustable IPAD holder wall or desk mounted
- Canoe paddle (disassemble)
- Cereal packet rejection method from conveyor

... each project had a scheme of learning lesson by lesson!

CARF



EXAM PREP



### OS Task 1 : Quick overview Task 1 : Design : 14 hours OUTCOMES :

- Design Specification
- Up to 3 annotated sketches
- Justification of the choice of one design for further development

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- Justification of the selection of the materials and components
- Design calculations & workings
- Engineering drawings of proposal
- 3D virtual CAD model of proposed design (screen captures),
- Bill of materials
- Research notes & sources

ΔΜΚΠ



## OS Task 2 : Quick overview

Task 2 : Manufacturing : 13 hours

OUTCOMES :

- Risk Assessment for Manufacturing
- Test Plan
- Test Results
- 3D prototype

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Recommendation no more than 6 students at a time when manufacturing – we did 4.

CARE

EXAM PREP

SHEESS



## Task 3 : Quick overview

• Task 3 : Peer Review (recommended in grps of 4)

60 mins per student – broken into smaller tasks

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10 mins to prep
10 mins to present & explain to peers
10 mins for the peer review group to discuss & reflect on the design before providing feedback
15 mins for peer review group to discuss the design with the presenter and as questions
15 mins for the peer review group to provide collective feedback on the peer review form to submit to assessor for approval

EXAM PREP


# Task 4 : Quick overview

## Task 4 : Evaluation & Implementation : 6 hours

## OUTCOMES :

- Changes/improvements to the 3D virtual model
- Revision Control Document (500 words)

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Evaluation & Implementation Report (800 words)

EXAM PREP



# Experience of Occupational Specialist Exam

- Start the logistical planning as early as you can Aug/Sept
- OS Exam schedule spreadsheet
- Planning with exams team & delivery team tasks in preparation, during and post exam – action plan
- Clarity of invigilation & staffing external invigilators, tutor assessors and invigilators, learning assistants, technicians
- Exam Window ... chose to go early  $15^{th} 26^{th}$  April

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- Assessment 29<sup>th</sup> April 13<sup>th</sup> May 2 hrs per student for all paperwork / photos / video etc.
- Exam team to upload 14<sup>th</sup> 17<sup>th</sup> April



# Experience of Occupational Specialist Exam

- Task 2 substantial planning get logistics in place for 'the known' early
- Pre-release OS brief with centre guidance on materials / equipment etc. – timely, 3 weeks

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- Not what we were expecting ... ... much more generic
- Stock / tools & equipment / components – enough for all !
- Potentially some form of jig to build as part of the testing process





## Task 2 Preparation

 Organisation of workshop – access to hand tools & equipment, materials, dedicated bench space, storage of student work etc.





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#### CARE

#### RESPECT

#### **SUCCESS**



# Task 2 Preparation

 Organisation of workshop – access to hand tools & equipment, materials, dedicated bench space, storage of student work etc.





#### AMBITION

#### CARE

#### **RESPECT**

#### **SUCCESS**



#### Experience of Occupational Specialism Exam

- 7 students broken into group of 4 and group of 3 (same for Peer Review) (max 6 recommended)
- Planned 2 full days for Task 2 but not consecutive days group 1 did day 1, then group 2 did their day 1
- Created a materials list, access to the materials & components from Task 1
- Impact of not having a dedicated space ...
- Students are selecting on their own all materials / tools / equipment ... familiarity important
- CAD room & workshop are adjacent so students can move between spaces freely (*invigilation impact*)
- C&G visit during Task 2, positive experience

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 Staffing – 2 tutors (assessors) and 2 Learning Assistants rota' d (but 1 learning assistant would have been enough) - IMPACT

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#### Experience of Occupational Specialism Exam

- Assessor Role 2 students; making detailed observation notes in line with the marking criteria & evidence required on the C&G paperwork (need to be subject specialists), take photos in line with assessment criteria, video of testing of the prototype in action
- We went paper based & had a folder / clip board for each student – locked away each evening (better if electronic)
- Dedicated camera/video device per student per day (4) with student name on the side – then downloaded each evening and reset clear for next day
- Photos we took loads then selected the ones which provided the best evidence (sent 12 off for each students & 2 videos)
- Storage of student work each evening in dedicated bench space – locked away

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Experience of Occupational Specialism Exam : Assessment

- A lot of paperwork to complete & co-ordinate advice to use throughout the year so assessors & students are familiar e.g. Peer Review
- 3 person assessment team so could also moderate
- Took at least 2 hrs per student block out time in the planning phase
- Planning & organising how student work / evidence will be saved / collated – file naming convention
- Exam teams had a few glitches; C&G very responsive

CARF



**Experience of Occupational Specialism** 

• Learning curve – continuous improvement

CΔRF

- Organisation & Planning proactive
- Right students on the course ... but that's for another time

# Thank you ....

# .... Any questions



# Awarding Body Update City and Guilds

The National T Level Conference

26<sup>th</sup> June 2024

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## Engineering and Manufacturing T Level

## A high-level overview of the Engineering and Manufacturing T Level

*T-LEVELS* Institute for Apprenticeshir & Technical Education

Alexandra Loney Technical Advisor – Engineering <u>Alex.loney@cityandguilds.com</u>



#### 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

# Engineering and Manufacturing 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.

Core680 GLH / 1000 TQTGradedA* - EPaper 1Maths & SciencePaper 2Engineering ConceptsESPEmployer Set ProjectCovers concepts and theories including core skills.	Occupational specialism 680 GLH / 1000 TQT Graded Pass/merit/distinction Based on occupational maps Covers practical skills and knowledge in a specialist occupational area.		
Assessment: External set and marked exams and an employer set project. Assessment: Synoptic assignment covering practical skills and applied knowledge.			

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:**

#### **Engineering Core Component (8730)**



#### Learners must complete:

- Engineering Core
- 1 Occupational specialism within a pathway



## **Route: Engineering and Manufacturing**

#### PATHWAY -Design and Development for Engineering & Manufacturing (8730 / 8714)





## **Route: Engineering and Manufacturing**

**PATHWAY - Maintenance, Installation and Repair for** 

#### **Engineering and Manufacturing (8730 / 8712)**





## **Route: Engineering and Manufacturing**

#### PATHWAY – Engineering, Manufacturing, Processing and Control (8730/8713)





## **Technical Qualification - Core**

Element	Title	GLH
1	Working within the engineering and manufacturing sectors	30
2	Engineering and manufacturing past, present, and future	30
3	Engineering representations	40
4	Essential mathematics for engineering and manufacturing	90
5	Essential science for engineering and manufacturing	90
6	Materials and their properties	60
7	Mechanical principles	35
8	Electrical and electronic principles	35
9	Mechatronics	30
10	Engineering and manufacturing control systems	30
11	Quality management	30
12	Health and safety principles and coverage	60
13	Business, commercial and financial awareness	30
14	Professional responsibilities, attitudes, and behaviours	15
15	Stock and asset management	15
16	Continuous improvement	30
17	Project and programme management	30



## **Core Content Examination**

Paper 1 – Maths and Science Principles for Engineering (6 Elements) (2hrs 30mins)

#### Paper 2 –

Engineering in Context (11 Elements) (2hrs 30mins)

17 Elements in total to make up the core

Assessment	Overall contribution	
Core examination 1	35%	
Core examination 2	35%	
Employer-set project	30%	

Element – Paper 1	GLH
Essential mathematics for engineering and manufacturing	90
Essential science for engineering and manufacturing	90
Materials and their properties	60
Mechanical principles	35
Electrical and electronic principles	35
Mechatronics	30

	Element – Paper 2	GLH
1	Working within the engineering and manufacturing sectors	30
2	Engineering and manufacturing past, present, and future	30
3	Engineering representations	40
10	Engineering and manufacturing control systems	30
11	Quality management	30
12	Health and safety principles and coverage	60
13	Business, commercial and financial awareness	30
14	Professional responsibilities, attitudes, and behaviours	15
15	Stock and asset management	15
16	Continuous improvement	30
17	Project and programme management	30



## **Website Navigation**

Or navigate through the C&G T Level Resource Hub webpage



Then select specifications and centre documents



#### Home > TLevels > Resource Hub Resources and support hub

Welcome to the Resource and Support Hub for T Level Technical Qualifications.

Here you'll find a range of teaching, learning and planning resources for tutors as well as information and support regarding approval, quality assurance, registration, bookings, timelines, fees and communications for all staff.



# **T-LEVELS**



## How we support you

Updates/Topics/Networks



Blended approach to communication

Provider networks and events

 الج

e-bulletin content and email updates

Website







#### https://www.cityandguilds.com/tlevels/providers

## **Support and Guidance**

Ready to support eligible providers and stakeholder engagement

- Timeline
- Provider focus groups
- Employer Industry Boards
- e-bulletins
- Specification
- Resource Hub

https://www.cityandguilds.com/tlevels/resources

- Learner flyer <u>t-levels-learner-flyer-engineering-</u> and-manufacturing
- Dedicated Technical Advisors



#### **Websites to Support Providers**

T Level Industry Placement Delivery Guidance <u>T Level industry placements delivery guidance - GOV.UK (www.gov.uk)</u>

Introduction to T levels T levels - GOV.UK (www.gov.uk)

How T Levels are funded How T Levels are funded - GOV.UK (www.gov.uk)

T Levels capital fund T Levels capital fund - GOV.UK (www.gov.uk)

T Levels resources for teachers and careers advisers

T Levels resources for teachers and careers advisers - GOV.UK (www.gov.uk)

T Levels: next steps for providers T Levels: next steps for providers - GOV.UK (www.gov.uk)

Supporting with delivering T Levels Support with delivering T Levels

ETF Foundation – T Levels <u>T Level Professional Development - Education & Training Foundation (et-foundation.co.uk)</u>



# Engineering and Manufacturing T Level: Core Textbook

Tackle the core component of your Engineering and Manufacturing T-Level head on with this comprehensive textbook published in association with City & Guilds / EAL.

- Complete coverage of the T Level's core component
- Prepares students for core exams and ESP
- Available in print and digital formats
- Print: 9781398360921 // £34
- Boost eBook: 9781398361058// £11 per year
- From expert authors Paul Anderson and David Hills-Taylor



LEARN MORE



Institute for Apprenticeships & Technical Education

# **T-LEVELS**

Questions? Thank you for attending

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# **Q&A Session**

The National T Level Conference 26<sup>th</sup> June 2024

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# **Q&A** Session

- Rebecca Healy, Careers Inspiration Manager at Engineering UK
- Richard Nash, Director of Engineering at UTC Leeds
- Lisa Wheeler, Head of Curriculum for Engineering & Digital Technology at York College
- Alex Loney, Technical Advisor at City & Guilds



# **Comfort Break**

The National T Level Conference

26<sup>th</sup> June 2024

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Technical Education Networks

Route: Engineering and Manufacturing

# Ministry of Defence Industry Placements

The National T Level Conference

26<sup>th</sup> June 2024

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# T Level Industry Placements with MOD





# Partnership



# Ministry of Defence



# Department for Education



# Fareham College & Navy Digital

T Level - Digital

#### First placement - 2023/2024 (3 Oct) UNDERWAY

Number of students - 2 (probable - further students from Fareham and from UTC Portsmouth next academic year)

Distance: 8 miles

Navy Digital

#### Fareham College

Key data: 16+; FE College; number on roll c. 1800

T Levels offered: Media production; Health and Science; Art, design and fashion; Business, finance and enterprise; Civil engineering and groundworks; Computing, IT and game development; Construction trades; Early years and education; Engineering and manufacturing.



# The project

Uplifting current onboarding process for Defence joiners

Joining the MOD and moving between posts within is governed by a myriad of processes and policies that are hard to find and understand. This increases the time for a new joiner to become an effective member of Defence and stat contributing to their workplace, having to spend time finding answers to questions and learning processes from a variety of places and people. "They really took this and ran with it whilst embedded in one of our development teams."

> Communications and Coordination Officer Data and Navy Applications

How can we elevate the onboarding experience of new joiners by improving their access to knowledge and information about the service?

# **Project Cycle**



# UTC Portsmouth & 1710 Naval Air Squdron

#### **T Level - Engineering**

#### First placement - 2023/2024 (18 Oct)

Number of students: 3 (probable 2 further students next academic year to run concurrently and also digital)

Distance: 3 miles

#### 1710 NAS

#### UTC Portsmouth

Key data: 14 - 19 UTC; number on roll: 456/600

T Levels offered: Maintenance, Installation and Repair and Installation for Engineering and manufacturing; Digital production design and development.







Ministry of Defence



Department for Education




# Yeovil College & RNAS Yeovilton

#### **T Level - Engineering**

#### First placement - 2023/2024 (Jan 24)

Number of students: tbd. (options such as innovation centre, historical flight being investigated)

Distance: 6 miles

**RNAS Yeovilton** 

<u>Yeovil College</u>

Key data: 16+; FE College; number on roll c. 9000

T Levels offered: Automotive Engineering; Business; Childcare; Construction; Digital; Education; Engineering; Health; Science.



### **Inspire Education Group &** 701/5001 Sqns RAF Wittering

ireat

sterton

Tinwell

Easton on

the Hill

#### T Level: tbd (likely Engineering)

#### First placement 2024/25

Number of Students: likely 2

Distance: IEG has two FE colleges -Stamford and Peterborough



#### **Inspire Education Group**

Key data: 5100 16 - 18 year olds

T Levels offered (from Sep 24): Digital Production and Design; Engineering, Manufacturing, processing and control; Surveying and Design for construction; Health and Science; Health; Building Services Engineering for construction; Onsite construction; Business and administration



Safeguarding and Child Protection concerns

Health and Safety of U18 concerns

Insurance worries

Communication difficulties

Senior Officer support

Security issues



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### Standing by to lend support

**Rural travel** 



#### Which T Levels?



### **MOD Locations**



#### Contact



Matthew Crossey

matthewcrossey@riverburn-consulting.com

Some images obtained under license from https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/

#### Your Perspective?



#### Tell Me What You Want (What you really, really want)

- Spice Girls (1996)



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(i) Start presenting to display the joining instructions on this slide.



## Plenary

The National T Level Conference

26<sup>th</sup> June 2024

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### Technical Education Networks (TEN)

technicaleducationnetworks.org.uk





### Additional Gatsby Support for <u>T Levels</u>

Teaching topics in production

Stock and asset management and continuous improvement.

**Professional responsibilities** 

Signposting existing RA Eng materials

**Research - Technical Education Networks** 

Any questions please contact kelly.butterworth@gatsby.org.uk



Technical Education Networks

### Additional Gatsby Support for T Levels

- Destinations- If you would like to see your students featured in future videos, please contact sarah.herdan@gatsby.org.uk [<u>https://www.technicaleducationnet</u> works.org.uk/destination-case-study-construction/]
- Gatsby is funding a project to support new collaborative curriculum planning networks, each working with a small group of colleges and facilitated by experienced FE curriculum professionals. The focus for each group will be shaped by the network members to support practical next steps for curriculum reform implementation.
- Gatsby is working in collaboration with Engineering UK, Make UK, Enginuity and the Royal Academy of Engineering, as well as many industry-specific trade bodies, to help engineering and manufacturing businesses understand T Levels and how they can get involved, to support students by hosting industry placements.

### Additional Gatsby Support for T Levels



- The National Apprenticeship and Skills Awards will be celebrating its 21st anniversary in 2024 and for the very first time will include awards to recognise T Level students and employers.
- The awards are designed to recognise and reward the achievements of exceptional apprentices and T Level students, skills champions and apprenticeship and T Level employers.
- Applications are now open. Visit the website for more information and to nominate your students and employer partners: <u>appawards.co.uk</u>



# Thank you for coming

The National T Level Conference

26<sup>th</sup> June 2024

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