

Technical
Education
Networks



Route: Engineering
and Manufacturing

T Level Design and Development for Engineering and Manufacturing

Guide to T-level curriculum macro-sequencing

This slide deck offers an overview of the components for the
Engineering and Manufacturing T-level curriculum.

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Where did we get the information from?

- The Association of Colleges (AoC) and Gatsby partnered with T-level providers to explore current practices in macro-sequencing of curriculum delivery models between January and August 2023.
- 55 providers took part in the research: 24 completed a survey, 51 had in-depth interviews, and 55 attended focus groups to create the delivery models presented and insight in this presentation.
- Feedback on emerging models was provided by delegates at Gatsby's Technical Education Networks (TEN) Conference in July 2023.
- Gatsby plan to review and update this insight annually. For more details, please contact TEN@gatsby.org.uk

Engineering and Manufacturing T-levels

The Engineering and Manufacturing route includes three T-levels:

1. T Level Design and Development for Engineering and Manufacturing
2. T Level Maintenance, Installation and Repair for Engineering and Manufacturing
3. T Level Engineering, Manufacturing, Processing and Control



T Level Design and Development for Engineering and Manufacturing

Qualification information

The technical qualification is organised into 17 topic areas in the core and four occupational specialisms.

The overall grading for the technical qualification is on a scale of Pass, Merit, Distinction, Distinction* with the Core graded A*- E and the Occupational Specialism graded Pass, Merit, Distinction, Distinction*.

Core knowledge and skills support threshold competence in the engineering and manufacturing industry. This is assessed through two examinations and the employer set project.

Core exam overview

Exam Paper 1	Exam Paper 2
<ul style="list-style-type: none"> • Essential mathematics for engineering and manufacturing • Essential science for engineering and manufacturing • Materials and their properties • Mechanical principles • Electrical and electronic principles • Mechatronics 	<ul style="list-style-type: none"> • Working with the engineering and manufacturing sectors • Engineering and manufacturing past, present and future • Engineering representations • Engineering and manufacturing control systems • Quality management • Health and safety principles and coverage • Business, commercial and financial awareness • Professional responsibilities, attitudes and behaviours • Stock and asset management • Continuous improvement • Project and programme management

Employer Set Project (ESP)

The Employer Set Project (ESP) assesses core knowledge and skills and four essential skills.

- Skill A – Planning and preparation
- Skill B – Communication
- Skill C – Developing proposals and concepts (Develop and manufacture)
- Skill D – Evaluation

The ESP is completed in May or October and there are four tasks to the assessment. Students are permitted 18 hours and 30 minutes to complete the ESP.

- Task 1 – Conduct research in relation to a project brief
- Task 2 – Draft a design to meet requirements of the brief
- Task 3 – Produce a programme of work plan
- Task 4 – Oral presentation of the project

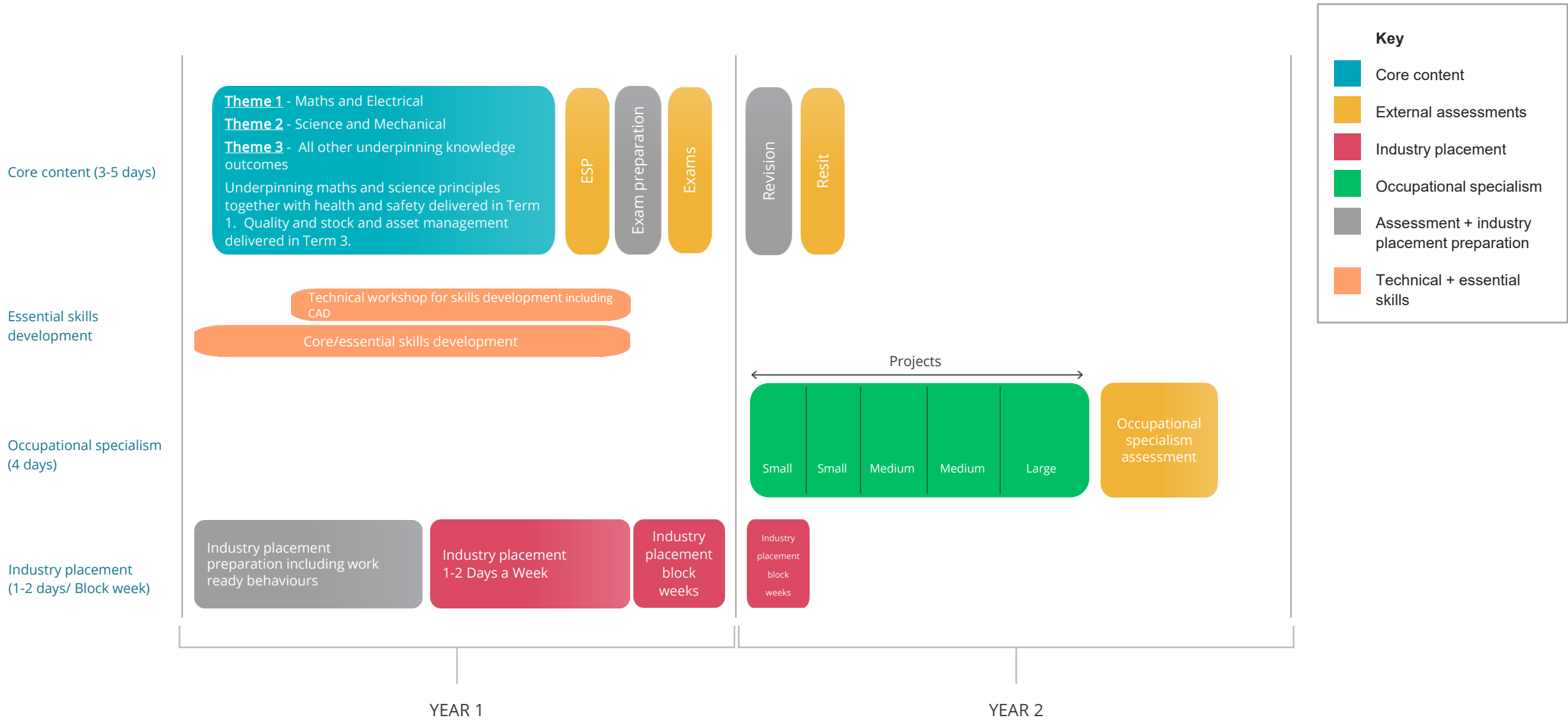
What is macro-sequencing?

Macro-sequencing is a structured and logical progression of the curriculum programme informed by pedagogical decisions.

The following model summarises provider feedback on their sequencing of the T-level curriculum, including the core, occupational specialism and industry placement.

The following slides and assessment elements provide a suggested curriculum model for the macro-sequencing of the T Level in Design and Development for Engineering and Manufacturing.

T Level Design and Development for Engineering and Manufacturing



Feedback on sequencing core content

Pedagogical considerations

Knowledge outcomes 4, 5, 6, 7, 8 and 9 were delivered using more teacher-led approaches. Outcomes 1-3, 10-17, were delivered using more project-based approaches with employer input and focussed on introducing the key concepts.

Thematic approach

Specific underpinning concepts in the core were allocated thematically to staff depending on their expertise and industry experiences. This provided accountability and responsibility for sequencing and scaffolding of delivery where needed.

Curriculum sequencing

In core delivery, health and safety was introduced early in the programme to underpin successful industry placement implementation. Term 1 then focussed on maths, science and engineering principles (mechanical, electronic, electrical, mechatronics), which were found to be engaging for the students. Underpinning concepts related to business such as quality and stock and asset management were delivered later in the academic year.

External assessment windows

Consider the dates and timings of the external assessments, particular what should be delivered before the summer employer set project window (ESP) and what content may be delivered between the ESP and core exams if sitting in the same assessment window.

Feedback on embedding skills in the curriculum

Technical skills

In year 1, time had been arranged for practical lessons in their engineering workshop to enable students to begin developing technical skills early in programme delivery. This included allocating half days in the electrical workshop and mechanical workshop in some cases to support skill development.

Computer aided design (CAD) skills

Time had been allocated in Year 1 for students to specifically develop their CAD skills in weekly workshops.

Core/essential skills

All providers included the development of core/essential skills into their underpinning knowledge outcomes delivery that were set in industry contexts. Students worked as members of a team to complete the challenges, carried out research to find solutions to problems and presented their outputs, ideas and solutions to employers and so the challenges followed the model of the ESP assessment and provided useful opportunities to develop these essential skills.

Industry placement (IP) preparation

All providers spent time with students preparing them for their IP putting emphasis on the development of CVs, expressions of interest and interview skills. Employers welcomed the opportunity to engage with students in advance through a mock recruitment process. All providers had processes to prepare students for placement that were delivered by a separate IP team.

Feedback on sequencing occupational specialism (OS) content

Introduction to OS content

Plan to deliver significant amount of OS content in the second year but introduce some in the first year to build a foundation for Year 2.

Project work for OS delivery

Employ project work as the primary method for delivering OS content. Align projects to the structure of the external assessments, potentially breaking down into individual tasks that can be delivered concurrently. Projects could start small and scale up in size/complexity for OS assessments.

Navigating the assessment schedule

Understand how the OS external assessment schedule impacts the macro-sequencing in Year 2. Balance the delivery of OS content with the scheduling of the industry placement(s).

Feedback on implementing industry placements

Timings of industry placements

Ensure students are suitably prepared to start industry placements and not too early in the programme, in order to support provider/employer relationships. This allows students to develop appropriate attitudes and behaviours to enter the workplace. It is important to adopt a flexible approach to when a placement could take place, for example offering multiple opportunities throughout the programme for block placement weeks.

Preparation for industry placements

Engage with employers early in the planning stages to ensure the scheduling of industry placements meets both the employer and provider's needs and expectations by sharing delivery plans around pre-placement and in-placement learning.

Individual learning objectives

Set employability-based objectives initially and once achieved progress onto more technical objectives related to their roles.

Further information on T-levels

- [Technical Qualification in Design and Development for Engineering and Manufacturing \(Version 1.2 - September 2023\)](#)
- [Guidance on effective practice in curriculum planning \(January 2023\)](#)
- [Guidance on T Level Industry Placement Delivery \(June 2023\)](#)