



# **BTEC Level 3 National Extended Diploma (1080 GLH) in Engineering: timetabling and sample two year delivery plan**

## **Audience**

This document is aimed at supporting teachers and those delivering BTEC National (2016) qualifications from September 2016.

## **Introduction**

Clear unit planning and understanding of key deadlines are essential for a successful delivery programme. We have produced a sample delivery plan showing how the BTEC Extended Diploma in Engineering (NQF) could be delivered over 1 year, highlighting assessment milestones and indicating where you can teach units holistically.

## **Key sections**

The document focusses on key dates to plan around and an example of how an extended diploma can be structured, set out in the three sections below:

### **Section 1: Guide to key dates**

Setting out the key activities and requirements for course delivery alongside dates and links to further information.

### **Section 2: Sample two year plan – delivery chart**

A chart setting out the key deliverables against chosen units for years one and two.

### **Section 3: Sample two year plan – detailed rationale**

An in-depth rationale and explanation as to how the suggested plan was structured

Further support can be found within the relevant specification on our website ([link to relevant spec page](#)).



Below is an overview of how wider support also links to this document:

<b>Support</b>	<b>Purpose</b>
Delivery Guides	A companion to your BTEC Level 3 National specifications, Authorised Assignment Briefs (AABs) and Sample Assessment Materials (SAMs). It contains ideas for teaching and learning, including practical activities, realistic scenarios, ways of involving employers in delivery, ways of managing independent learning and how to approach assessments. The aim of this guide is to show how the specification content might work in practice and to inspire you to start thinking about different ways to deliver your course.
Authorised Assignment Briefs	Provides scenarios and teaching plans for each unit, to be used either as they are set out, or to inform your own planning.
Schemes of Work	Demonstrates how the unit content can be covered in the GLH while providing lesson ideas and highlighting links to other units to help you plan your teaching.
Sample Assessment Materials	Examples of how an externally assessed unit may be presented, with an accompanying mark scheme. These sample assessment materials have been developed to support this qualification and will be used as the benchmark to develop the assessment students will take. These cover both exams and tasks.



## Section 1: Guide to key dates

Setting out the key activities and requirements for course delivery alongside dates and links to further information.

Date	Action	Description	Resource/reference
August–October	OSCA (Online Support for Centre Assessors)	Centres need to register a Lead Internal Verifier (LIV) for each principle BTEC Subject Area. The LIV must download the OSCA materials and use it to standardise the assessment and delivery team for the programme.	Edexcel Online. Your Exams Officer can provide a LogIn.
August/September	Assessment Plan(s)	An assessment plan(s) must be in place to demonstrate that sufficient time is available to deliver and assess all the required units in a timely manner. More than one plan may be required if there are different groups working at different speeds.	Assessment plans are available <a href="#">here</a>
August/September	Assignment briefs	Assignment briefs should be internally verified to ensure they are fit for purpose and the equipment, resources and staff expertise will be available.	Authorised assignment briefs are available <a href="#">here</a>
September	Learner induction	A short period of induction is strongly recommended to ensure learners are familiar with the programme and its requirements. Plagiarism, referencing, time management skills, importance of meeting deadlines and centre policies should be covered.	
October	Register your learners	Learner registrations need to be made by 31 <sup>st</sup> October. This will trigger the allocation of a Standards Verifier and support for your centre.	Edexcel Online
December–February	Allocation of Standards Verifier	The Standards Verifier should cover QCF and NQF programmes. They will need to see the assessment plan(s) and will agree a sampling schedule with the centre. They are available to provide support and guidance.	The details of the Standards Verifier will be emailed to the Quality Nominee at the centre. Please ensure the Quality Nominee details registered with Pearson are accurate.
December /January	External Assessment Entries	Unit 1 and Unit 3 External assessment entries	Edexcel Online



January	Unit 3 pre release	The pre-release (Part A) for Unit 3 released to allow centres to complete Part A of this externally assessed unit.	BTEC website? Exams Officer?
February	External Assessment Entries	Unit 1 and Unit 3 External assessment entries	Edexcel Online
April/May	Unit 1 and Unit 3	Unit 1 and Unit 3 external assessment	ICEA document is available <a href="#">here</a>
Mid May-30 <sup>th</sup> May	Internally assessed unit completed	Internally assessed unit(s) needs to have been sampled and reported by 30 <sup>th</sup> May	A guide to Standards is available <a href="#">here</a>
30 <sup>th</sup> June	Second sampling completed	Second sampling of Internally assessed units that were not released for certification must be complete.	
Tbc	Certification claims made	The final date for certification claims to be made via Edexcel online for summer	



## Section 2: Sample two year plan – delivery chart

### EXTENDED DIPLOMA (1080 GLH) IN ENGINEERING: SAMPLE TWO YEAR DELIVERY PLAN

It is important to note from the outset that this is a suggested 'Delivery Plan', designed to help structure the delivery of the unit content, as well as planning assessment. This is no means a definitive or a prescribed document. Pearson recognise that each and every centre will want to stamp their mark on delivery and will want to teach to the strengths of resourcing, including both physical resources and human resources.

Centres are also encouraged to include optional units that will meet the local needs and reflect employability and/or progression to higher education, relevant to location.

Pearson wants centres to think 'outside of the box' in order to represent the actual constraints, challenges and competitive nature of the modern music industry.

This plan is intended to be used as guidance.

#### Key

R = Revision for External Assessment

EX = External Assessment

SA = Summative Assessment

WEP = WORK EXPERIENCE PLACEMENT

The Level 3 National Extended Diploma in Engineering suggests 1080 guided learning hours (GLH), consisting of seven mandatory units (four internal and three external units). For the unendorsed engineering pathway these can be taken from a range of sectors, whilst for pathways they are generally specific to that particular area of engineering. Learners must complete and achieve a pass or above for all the units in group (Units 1, 2, 3, 4, 6). Learners must complete all mandatory internal units in group B. With regards to the optional units, learners must complete up to four units taken from the published groups C, D and E depending on pathways.

There is no mandatory requirement for a work experience placement within the qualification but learners will significantly benefit from access to local employers when completing mandatory units - Unit 2 and Unit 4. It is recommended that centres include opportunities for site visits, guest seminars and case studies.

The delivery plan example includes Unit 9: Work Experience in the Engineering Sector. This unit obviously means that centres will need to have access to appropriate employers who can provide suitable work experience opportunities across a number of engineering job roles. If this is not feasible it is advisable to substitute the unit, using an optional unit from group E.

There are three externally assessed units - Unit 1, Unit 3 and Unit 6. Unit 1: Engineering Principles: Learners are expected to learn and show their understanding of the arithmetic processes, mechanical principles and electrical/electronic principles. Assessment takes the form of a written examination to be taken over two hours, which is available in January and May/June of each year.



Unit 3: Engineering Product Design and Manufacture: Learners produce an improvement to the design of an existing product in response to an industry-specific brief. This is based on realistic problems faced by engineers and is a task-based assessment. The actual assessment is a task set by Pearson. This is a supervised assessment over a period of 8 hours in a two-week period. Pearson will timetable this.

Unit 6: Microcontroller Systems for Engineers. Learners will be assessed by a set task provided by Pearson and completed under supervised conditions. The supervised assessment period is approximately 12 hours and can be arranged over a number of sessions in a two-week period timetabled by Pearson, however once started must be completed within five days. During the supervised assessment period, learners will be assessed by a practical task where they will develop a prototype microcontroller system to solve a problem. Learners must complete this task using a computer.

Delivering the externally-assessed units 1 and 3 in year 1 offers an opportunity for a resit in the second year.

It is essential that a Level 3 curriculum allow learners the opportunity to develop a solid foundation of skills and knowledge at the same time as facilitating the development of specialist skills that represent the diverse needs of the engineering sectors. The selected units in this example have therefore been carefully selected to provide learners with a diverse and broad curriculum. The unit choice will also allow for successful transition into the workplace or higher education. In year 1, the suggested delivery plan deliberately holds back units such as Static Mechanical Principles in Practice and Dynamic Mechanical Principles in

Practice until after the first half term. This type of delivery model will allow centres to give learners an intense initial period of development in order to secure essential key learning. Focussing early on theory is really important and will support vocational



development later in the academic year. The suggested timing of units also allows realistic assessment and synergy across units.

An example here is the assessment of Unit 10: Computer Aided Design in Engineering, which has been positioned in the last week of term. This allows learners the opportunity to build on the skills gained from Unit 2 Learning Aim B.

As an approved centre there is a requirement to ensure that every learner has access to meaningful activity involving employers. Meaningful relationships with the music industry should certainly enhance the experience of learners. Pearson appreciate that this is not always easy however centres are encouraged to develop links with local employers/employees, such as specialist engineering companies, service engineers or engineering designers. Centres are also encouraged to utilise the vast amount of online resources that exist. These will encourage problem solving and relevant working practices that reflect the future working patterns of the industry. Another approach may be to work with industries that manufacture components that are used in a range of sectors. This may be a useful way to provide learners with experience of working on briefs produced by external clients who regularly commission work for bespoke items. In particular, this may of use to centres in less urban areas.



**TEACHING**

The Year 1 delivery plan highlights four mandatory units and three optional units (that can be substituted dependent on the centre). It is anticipated that there should be a large amount of taught content in the first term, in order to build a strong foundation of basic skills and knowledge, associated with engineering across a range of sectors. This solid foundation is paramount in the delivery of hands on units where learners are applying skills in a vocational context. Staff teams are encouraged to draw from industry practice, case studies and industry protocols as much as feasibly possible. The development of transferable employability skills is absolutely critical for the long term development of learners. The optional units in Year 1 will also prepare learners for the rigour of Year 2 units.

This year is all about developing an essential 'tool kit' of skills and knowledge. The first six weeks offers an opportunity to embed some of the core skills and knowledge learners will need to progress to the more specialist units. These weeks can be used to secure essential theory, work ethic, expectations and academic study skills. After the first half term the introduction of

Unit 27: Static Mechanical Principles in Practice and Unit 28: Dynamic Mechanical Principles in Practice allow for the introduction and development of the knowledge and understanding of these aspects of engineering. These units also provide further enhancements to the delivery of Unit 1, with content complementing the theory covered for Engineering Principles. Assessment features from week 26 through to week 30 and is staggered enough to enable centres to manage learners.

YEAR 1					Term 1												
Unit	Unit title	Guided learning hours	Hours per week	Assessment method	1	2	3	4	5	6	7	8	9	10	11	12	13
1	Engineering Principles	120	2	External													
2	Delivery of Engineering Processes Safely as a Team	60	2	Internal												SA	SA
3	Engineering Product Design and Manufacture	120	1.75	External													





4	Applied Commercial and Quality Principles in Engineering	60	2	Internal													SA	SA	
27	Static Mechanical Principles in Practice	60	2	Internal															
28	Dynamic Mechanical Principles in Practice	60	2	Internal															
10	Computer Aided Design in Engineering,	60	2	Internal															



Unit	Unit title	Guided learning hours	Hours per week	Assessment method	Term 2											
					14	15	16	17	18	19	20	21	22	23	24	25
1	Engineering Principles	120	2	External												
2	Delivery of Engineering Processes Safely as a Team	60	2	Internal				SA	SA							
3	Engineering Product Design and Manufacture	120	1.75	External												
4	Applied Commercial and Quality Principles in Engineering	60	2	Internal							SA	SA				
27	Static Mechanical Principles in Practice	60	1.75	Internal	SA	SA									SA	SA
28	Dynamic Mechanical Principles in Practice	60	1.75	Internal	SA	SA									SA	SA
10	Computer Aided Design in Engineering,	60	1.75	Internal												SA



Unit	Unit title	Guided learning hours	Hours per week	Assessment method	Term 3										
					26	27	28	29	30	31	32	33	34	35	36
1	Engineering Principles	120	2	External	R	R	R	R	R	EXT		Sub- mit EXT			
2	Delivery of Engineering Processes Safely as a Team	60	2	Internal	SA	SA	SA	SA							
3	Engineering Product Design and Manufacture	120	1.75	External	R	R	R	R	R	R	EXT	EXT	EXT	Sub- mit EXT	
4	Applied Commercial and Quality Principles in Engineering	60	2	Internal			SA	SA							
27	Static Mechanical Principles in Practice	60	1.75	Internal										SA	SA
28	Dynamic Mechanical Principles in Practice	60	1.75	Internal										SA	SA
10	Computer Aided Design in Engineering	60	1.75	Internal				SA						SA	SA



The Year 2 plan highlights three mandatory units and four optional units (that can be substituted dependent on the centre). The emphasis in Year 2 is on employability. Much of the work can be delivered through real life engineering briefs. Learners should be encouraged to adopt the philosophy begin problem solvers and be able to apply skills in a range of contexts. They should work to deadlines, consider the quality and presentation of work and make clear reference to the expectations of engineering organisations. Learners should constantly reference the work of the engineering sectors and realise the crossover of units and sectors. This can be achieved by careful assessment design. It is important that learners are given the skills, knowledge and working environment to develop solutions to engineering problems. Project time should be factored in to timetabling. Centres are encouraged to involve industry professionals in all aspects of delivery and assessment whenever possible or indeed feasible. This year is all about the application of skills and knowledge. There is an emphasis on 'project' and 'portfolio' development. Learners should be encouraged to extend learning opportunities into industry. Examples here could be through work experience, working to commercial briefs, or working on briefs provided by engineering organisations. At the end of year learners should feel equipped and empowered to seamlessly progress into employment or higher education.

YEAR 2					Term 1												
Unit	Unit title	Guided learning hours	Hours per week	Assessment method	1	2	3	4	5	6	7	8	9	10	11	12	13
1	Engineering Principles	120	2	External													
3	Engineering Product Design and Manufacture	120	1.75	External													
5	A Specialist Engineering Project	60	2	Internal												SA	SA
6	Microcontroller Systems for Engineers	120	3.5	Internal													
7	Calculus to Solve Engineering Problems	60	2	Internal												SA	SA
9	Work Experience in the Engineering Sector	60	3.5	Internal												SA	SA



19	Electronic Devices and Circuits	60	2	Internal												
21	Electronic Measurement and Testing of Circuits	60	2	Internal												
					<b>Term 2</b>											
Unit	Unit title	Guided learning hours	Hours per week	Assessment method	14	15	16	17	18	19	20	21	22	23	24	25
1	Engineering Principles	120	2	External												
3	Engineering Product Design and Manufacture	120	1.75	External												
5	A Specialist Engineering Project	60	2	Internal											SA	SA
6	Microcontroller Systems for Engineers	120	3.5	Internal												
7	Calculus to Solve Engineering Problems	60	2	Internal									SA	SA		
9	Work Experience in the Engineering Sector	60	3.5	Internal	WEP	WEP	SA	SA								



19	Electronic Devices and Circuits	60	2	Internal					SA	SA						
21	Electronic Measurement and Testing of Circuits	60	2	Internal							SA	SA				

Term 3

Unit	Unit title	Guided learning hours	Hours per week	Assessment method	26	27	28	29	30	31	32	33	34	35	36
1	Engineering Principles	120	2	External	R	R	R	R	R	EXT		Submit EXT			
3	Engineering Product Design and Manufacture	120	1.75	External	R	R	R	R	R	R	EXT	EXT	EXT	Sub- mit EXT	
5	A Specialist Engineering Project	60	2	Internal					SA	SA					
6	Microcontroller Systems for Engineers	120	3.5	Internal	R	R	R	R	R	R	EXT	EXT	EXT	Sub- mit EXT	
7	Calculus to Solve Engineering Problems	60	2	Internal									SA		
9	Work Experience in the Engineering Sector	60	3.5	Internal											
19	Electronic Devices and Circuits	60	2	Internal									SA		



21	Electronic Measurement and Testing of Circuits	60	2	Internal										SA		
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## Section 3: Sample two year plan – detailed rationale

### Overview

This is a suggested plan for the **BTEC National Extended Diploma** in Engineering qualification with 1080 GLH. There is no mandatory requirement for a work experience placement within the qualification. Access to local employers through site visits, guest speakers or case studies would help learners understand the unit content in vocational settings.

### Involving employers in the assessment/delivery

The qualification is made up of units with considerable practical content and there are many opportunities to involve employers in the planning, delivery and assessment of the course through visits, guest speakers and placements where possible/desired. Learners will benefit from opportunities to work alongside practitioners.

### Which units are externally assessed?

There are three externally assessed units. **Mandatory Unit 1** is a traditional examination. Unit 1 will be first available in May/June 2017, and will then be available in January and May/June in each subsequent year from January 2018. Dates will be timetabled by Pearson.

**Unit 3** is a problem-based, externally-assessed task to be completed over a two-week period determined by Pearson. The research task (Part A) is set and completed during a maximum of three hours of supervised conditions in the first week. Part B is completed during a two week under controlled conditions. The first opportunity for learners to be assessed for this unit is April/May 2017. There will be a January and a May/June assessment opportunity in future years. The assessment periods may vary slightly year on year, and will be set by Pearson.

**Unit 6** is a further externally-assessed task that is only included in the 1080 GLH Extended Diploma. This could be included in year 2 as it is anticipated that learners will find this a very demanding assessment activity and time will need to be available for them to acquire the necessary skills to develop the required skills for programming microcontrollers and applying them to solve problems.

### Internal mandatory units

There is one internal mandatory unit for the Extended Certificate, Unit 2: Delivery of Engineering Processes Safely as a Team. This covers three distinct areas of engineering, namely engineering processes, computer aided design and working as part of a team to produce a batch of products. It is important that learners are provided with opportunities throughout the team work activity to work both as a team member and also a team leader.

For the Foundation Diploma, Diploma and Extended Diploma there are further internally assessed mandatory units, Unit 4: Applied Commercial and Quality Principles in Engineering. This unit offers scope for involvement with local employers to investigate how the organisation is structured and also to examine their quality systems. A further mandatory unit at Diploma is Unit 5: A Specialist





Engineering Project, whilst for Extended Diploma Unit 7: Calculus to Solve Engineering Problems is also mandatory and internally assessed.

Depending on pathways, Unit 32: Computer System Principles and Practice (computer engineering), Unit 39: Modern Manufacturing Systems (manufacturing engineering), Unit 48: Aircraft Flight Principles and Practice (aeronautical engineering) are also internally assessed mandatory units for the Diploma and Extended Diploma.

This is a suggested plan for the **BTEC National Extended Diploma** in Engineering qualification with 1080 GLH.

There is no mandatory requirement for a work experience placement within the qualification. Access to local employers through site visits, guest speakers or case studies would help learners understand the unit content in vocational settings.

### **Suggestions for which units to teach in year 1**

The plan shows four mandatory units (1, 2, 3 and 4), that provide a good base for further study and could be taught together since each unit contains key concepts, practical techniques and analytical skills. These units should be delivered from the first week as to ensure learners have time to complete the examined content whilst developing the required practical skills, positive understanding of health and safety required, and knowledge of engineering processes.

The **6 optional units** selected should meet the needs and interest of the learners while providing insight into specialism within subject areas. Unit 27 has been suggested as a first-year option as it provides a strong overlap between engineering principles and static systems, with Unit 28 is also selected to ensure there is some complementary content for dynamic systems. Both units will also contribute to the synoptic assessment of Unit 3. Centres may prefer to focus on other areas by selecting two complementary options, such as behaviour of materials (Units 25 and 26), or maintenance (Units 24 and 30), but consideration needs to be given to the unit combination and ensuring that selected options are within the appropriate groups for the Extended Diploma. Centres may wish to consider delaying the start of the optional units until some key concepts from Unit 1 and Unit 4 have been delivered. In this case it is important that summative assessments are planned to ensure sufficient time is still available for intensive revision and preparation for the externally set assessments in term 3.

Completing the four mandatory units and two optional units in year 1 will afford the opportunity of a fall-back award of National Foundation Diploma (providing suitable optional units have been selected) should learners fail to complete their second year.

It is strongly recommended that most, if not all the **internally assessed units** have been completed and are available for first sampling to meet the **30<sup>th</sup> May** deadline.

It is important that the teaching and learning covers all the unit content and that learners are fully prepared for the assessments with appropriate revision time being made available before the examinations.



### Suggestions for which units to teach in year 2

In year 2, Unit 6 is externally examined and assesses learners understanding of microcontrollers in an engineering context. The first opportunity to sit Unit 6 is in June. This sitting would mean that preparatory work required to cover all the unit content prior to the exam can be completed throughout the year.

At this stage in their studies the learners should have enough practical skills and understanding to begin the **internally set and assessed Unit 5** at the start of the year. Learners need to identify potential projects and develop an outline plan for an investigation that they will then carry out and evaluate. Identification and planning should occur before the end of term 4. This should allow enough time for all aspects of the project to be fully completed by the end of term 6.

The remaining **four internally assessed optional units** would also be delivered in year 2. Care needs to be taken in ensuring the units selected meet the qualification title requirements and do not exceed the maximum number of permitted units from each subject grouping, all of which vary depending on pathways. In this example two units are selected from Group C (Units 19 and 21), one from Group E (Unit 9). Broadly speaking this provides two optional units from each area of engineering and covers a variety of engineering skills without focussing on one sector area, remaining relevant to all the learners.

Centres are encouraged to timetable a period of induction for learners at the start of the programme. This should include information on topics such as the structure of the units, how to use an assignment brief, importance of command words, how to work to meet deadlines, consequences of not meeting deadlines, how to reference work and the importance of evidence submitted for assessment being independently produced, valid and authentic. Centre policies on malpractice and plagiarism should be explained.

Pearson has provided a set of *Skills for Learning and Work* activity sheets you may wish to use during induction.

**NB** internally assessed units can only be sampled when all learners have completed the unit, resubmissions have occurred and been assessed and internally verified. All units must be available for first sampling and reporting to have occurred by the **30<sup>th</sup> May** in the year of certification.

Delivery and assessment of year 2 units can start at the end of year 1. If this opportunity is to be utilised, centres must be aware that an assignment started in one academic year must be completed, including resubmissions, in that same academic year. This could be a good opportunity to deliver some of the Unit 6 content to allow learners to become familiar with the software they will be using.

Learners could have a resit opportunity for Unit 1 or 3 in January 2020 **or** May 2020, if required. Unit 6 is only available in May/June of each year.