YEAR 10

Autumn 1	Key knowledge/content to learn and retain	Essential skills to acquire (Subject and generic)	Link to other units / subjects	Why this task now	Anticiplted misconceptions	Links to KS3	Links to KS5	Opportunity for stretch for high prior attainers	SMSC & British Values	Cultural Capital / Big Picture	Visit / talk opportunities	Career links	
R014 - Principles of Engineering Manufacture	Health and safety, risk assessments and units of measure/merasurements Topic Area 3-Manufatcuring requirements - interpretating 3rd angle Test on Topic Area 3	Meaning of line types: Standard conventions for dimensions Abbreviations Representation of mechanical features Health and safety considerations	Engineering Design - technical drawing Maths - units of measure Science - practical safety	New school new expecations and new machinery. Maths department look at measurements and units in Autumn 1. simultanious delivery of technical drawing for design and manufacture allows for more depth of knowledge. Vital to be able to intrepret a technical drawing before NEA can start.	Hazards and risks Risk ratings Use of measurements and units	Creating technical drawings in Design. Understanding of risks and how to be safe in practical sessions	Mechanical Design (unit 9) Computer Aided Design (Unit 10) Mechnical Operations (Unit 13)	Conducting risk assessment for activities being done in workshop practical sessions. Annotation and explanation of key features. Identification of missing features and creation of own technical drawing.	Rule of Law - Health and saftey at work act Legislative - H&S Technical drawing standards BS8888	Understanding of health and safety legislatiomn and universal systems for engineering drawings and how these can be shared and understood globally. BS8888	Ospray plastics - September	https://education.theiet.org/secondary/careers/engineering-careers-resources/	Health and safety Auditor Draftsperson Fitter Covered on all apprenticeships and university engineering qualifications
R015 - manufacture of a one off product	Interpreting engineering drawing in preparation for manufacture				Use of measurements and units			Annotation and explanation of key features. Identification of missing features and creation of own technical drawing.					
R016 - Manufacturing in quantity													
Practical	Hand fabrication - measuring and marking	As R014 and R015 Wasting and finishing processes	R014 Topic Area 1.2 Design - use of technical drawing, Maths - measurements, science - materials	Measuring, marking and accuracy is the basis for all practical work. Sheet material is one dimensional so is more straight forward	Use of hacksaw, hand positions, use of files and techniques, measurement inaccuracies.	H&S Design and Technology - design,make and technical knowledge	Mechanical Design (unit 9) Computer Aided Design (Unit 10) Mechnical Operations (Unit 13)	Use of production planning and evaluation	Rule of Law - Health and saftey at work act Legislative - H&S Technical drawing standards BS888	Safe use of hand tools. Workshop routines and tidy working areas			
Independent Study	Use of Seneca and Kahoots based on topics covered												

Autumn 2	Key knowledge/content to learn and retain	Essential skills to acquire (Subject and generic)	Link to other units / subjects	Why this task now	Anticiplted misconceptions	Links to KS3	Links to KS5	Opportunity for stretch for high prior attainers	SMSC & British Values	Cultural Capital / Big Picture	Visit / talk opportunities	Career links	
R014 - Principles of Engineering Manufacture	Topic Area 2 Engineering materials - Metals, polymers, ceramics, composite, smart their properties and applications Test on Topic Area 2 so far	Material types and uses. Material propoerties and definitions. Typical forms of supply eg sheet or bar.	Science - chemistry - periodic table	Links to Science delivery of materials, is reinforced in a practical enviroment due to using different materials and processes.	Ferrous Metals Alloys Strength/property definitions	Science Chemistry - materials / atoms elements and compounds Design and Technology - design,make and technical knowledge	Material Science (Unit 11) Mechanical Operations (Unit 13)	Materials usage in tools, heat treatment to change properties.	Legislative - Use of specifed materials in specific usage such as automotive or aerospace	Materials usage for applications. Why these materials are used and what their pros and cons are.	IGUS - Polymers	https://education.theiet.org/secondary/careers/engineering-careers-resources/	Metallurgist - Scientist of materials Engineering Production planner Operations manager Coded Welder
R015 - manufacture of a one off product	Planning for manufacture/risk assessment	Materials required, processes, tools and equipment required, sequence of operations, health and safety considerations and quality control requirements	Engineering Design - production planning Science - practical safety	Employer excellence projects underway and building skills for manufacture. Follow on from understanding and intrpretation of technical drawing.	Processes and level of detail needed	Design and Technology - design, make and technical knowledge	Mechanical Operations (Unit 13)	Greater detail in production plan. Development of plan H&S into risk assessment		Importance of planning tasks prior to manufacture.			
R016 - Manufacturing in quantity													
Practical	Welding, forging and turning	MIG welding techniques, suitable materials. Turning processes and key features and techniques. Health and safety.	R014 and R015 - joining methods, wasting processes and material propoerties.	Links to R014 delivery andmaterial properties - heat treatment to change properties. R015 for production planning of turned component.	Axis on lathe. Key features such as saddle, cross slide and compound slide.	Science Chemistry - materials / atoms elements and compounds Design and Technology - design,make and technical knowledge	Material Science (Unit 11) Mechanical Operations (Unit 13)	Tighter tolerance of manufacture. Production planning and evaluation.	Rule of Law - Health and saftey at work act Legislative - H&S Technical drawing standards BS888	Safe use of heat treatment processes and machines. Workshop routines and tidy working areas			
Independent Study	Use of Seneca and Kahoots based on topics covered												

Spring 1	Key knowledge/content to learn and retain	Essential skills to acquire (Subject and generic)	Link to other units / subjects	Why this task now	Anticiplted misconceptions	Links to KS3	Links to KS5	Opportunity for stretch for high prior attainers	SMSC & British Values	Cultural Capital / Big Picture	Visit / talk opportunities	Career links	
R014 - Principles of Engineering Manufacture	Topic area 2 Engineering materials - Other properties influencing manufacturing Topic area 1 - Manufacturing processes Test on Topic Area 2 and 1	Material properties Wasting processes Froming processes Additive processes Joining processes	R015 - Students are required to manually process materials when perfomring manufacturing operations	Build knowledge and understanding about wasting processes will aid development of R015 risk assessments. Retreival of hand fabrication knowledge	Strength Toughness Malleability Ductility	Science Chemistry - materials / atoms elements and compounds Design and Technology - design,make and technical knowledge	Material Science (Unit 11) Mechanical Operations (Unit 13)	Use of CAD and CAM in manufacture - wasting and additive	Legislative - Use of specifed materials in specific usage such as automotive or aerospace	Materials usage for applications. Why these materials are used and what their pros and cons are.			

R015 - manufacture of a one off product	Planning for manufacture conducting risk assessments and undertaking practical	Materials required, processes, tools and equipment required, sequence of operations, health and safety considerations and quality control requirements	Engineering Design - production planning Science - practical safety	Employer excellence projects underway and building skills for manufacture. Follow on from understanding and intrpretation of technical drawing.	Processes and level of detail needed	Design and Technology - design,make and technical knowledge	Mechanical Operations (Unit 13)	Greater detail in production plan. Development of plan H&S into risk assessment	Willingness to reflect on their experiences. Social understanding through shared use of machines and raised awarenss of consequences for actions through safety and accuracy.	Importance of planning tasks prior to manufacture.	Schneider	https://education.theiet.org/secondary/careers/engineering-careers-resources/	
R016 - Manufacturing in quantity													
Practical	**Turning (Non Examination Assessment)**	Materials required, processes, tools and equipment required, sequence of operations, health and safety considerations and quality control requirements Quality control and use of measuring tools	Follows on from turning employer excellence project and fabrication employer excellence project and production plans are underway.	Links to R014 and R015 wasting process, marking out and production planning of turned component.	Axis on lathe. Key features such as saddle, cross slide and compound slide.	Science Chemistry - materials / atoms elements and compounds Design and Technology - design,make and technical knowledge	Material Science (Unit 11) Mechanical Operations (Unit 13)	Tighter tolerance of manufacture. Development of production planning and evaluation.	Rule of Law - Health and saftey at work act Legislative - H&S Technical drawing standards BS888	Safe use of machines. Workshop routines and tidy working areas			
Independent Study	Use of Seneca and Kahoots based on topics covered												

Spring 2	Key knowledge/content to learn and retain	Essential skills to acquire (Subject and generic)	Link to other units / subjects	Why this task now	Anticiplted misconceptions	Links to KS3	Links to KS5	Opportunity for stretch for high prior attainers	SMSC & British Values	Cultural Capital / Big Picture	Visit / talk opportunities	Career links	
R014 - Principles of Engineering Manufacture	Topic area 1 - manufacturing processes Topic area 1.1 test on shaping, forming, additivite, joining and finishing	Finishing and wasting processes	R015 - Students are required to manually process materials when perfomring manufacturing operations. R016 - Students could program and use a CNC laser cutter	Beneficial and allows for a deeper knowledge if the process' strengths and weaknesses is understood and can be applied to the product in R015	Which process would be used for products and appropriate evaluation of thoughts	Design and Technology - design,make and technical knowledge	Material Science (Unit 11) Mechanical Operations (Unit 13)	More complex products used to determine manufacturing processes on	Legislative - Use of processes in specific usage such as automotive or aerospace	Manufacuring process usage for applications. Why these are used and what their pros and cons are. Product conformity and acheiveable tolerances	Unison	https://education.theiet.org/secondary/careers/engineering-careers-resources/	Engineering Quality Controller / inspector Advanced manufacturing researcher Advanced Manufactuing operator Machinist
R015 - manufacture of a one off product	Generating storyboards for evidence capture, creating evaluations to show accuracy and part compliance and undertaking practical	Materials required, processes, tools and equipment required, sequence of operations, health and safety considerations and quality control requirements Quality control and use of measuring tools	Engineering Design - production planning Science - practical safety	Employer excellence projects underway and building skills for manufacture. Follow on from understanding and intrpretation of technical drawing.	Use of different measuring tools - vernier scales		Mechanical Operations (Unit 13)	Use of graphs and charts (statistical process control) in evalutaions - lean and qaulity level 3 unit	Willingness to reflect on their experiences. Social understanding through shared use of machines and raised awarenss of consequences for actions through safety and accuracy.	Importance of quality control and product conformity			
R016 - Manufacturing in quantity													
Practical	**Turning (Non Examination Assessment)**	Turning processes and key features and techniques. marking out techniques. Health and safety.	Follows on from turning employer excellence project and fabrication employer excellence project and production plans are underway.	Links to R014 and R015 wasting process, marking out and production planning of turned component.	Axis on lathe. Key features such as saddle, cross slide and compound slide.	Science Chemistry - materials / atoms elements and compounds Design and Technology - design,make and technical knowledge	Material Science (Unit 11) Mechanical Operations (Unit 13)	Tighter tolerance of manufacture. Development of production planning and evaluation.	Rule of Law - Health and saftey at work act Legislative - H&S Technical drawing standards BS888	Safe use of machines. Workshop routines and tidy working areas			
Independent Study	Use of Seneca and Kahoots based on topics covered												

Summer 1	Key knowledge/content to learn and retain	Essential skills to acquire (Subject and generic)	Link to other units / subjects	Why this task now	Anticiplted misconceptions	Links to KS3	Links to KS5	Opportunity for stretch for high prior attainers	SMSC & British Values	Cultural Capital / Big Picture	Visit / talk opportunities	Career links
R014 - Principles of Engineering Manufacture	Topic area 1 - Manufacturing processes Topic area test on topic are 1 so far	Wasting processes - machining Shaping processes Froming processes	R015 - Students are required to manually process materials when perfomring manufacturing operations	Beneficial and allows for a deeper knowledge if the process' strengths and weaknesses is understood and can be applied to the product	Axis on machines Key feature names Porcesses for product and material selection	Design and Technology - design,make and technical knowledge	Mechanical Operations (Unit 13)	More complex products used to determine manufacturing processes on	Legislative - Use of processes in specific usage such as automotive or aerospace	Manufacuring process usage for applications. Why these are used and what their pros and cons are. Product conformity and acheiveable tolerances	Not applicable in this term due to R015 deadline in May	https://education.theiet.org/secondary/careers/engineering-careers-resources/
R015 - manufacture of a one off product	Generating storyboards for evidence capture, creating evaluations to show accuracy and part compliance and completing practical	Materials required, processes, tools and equipment required, sequence of operations, health and safety considerations and quality control requirements Quality control and use of measuring tools	Engineering Design - production planning Science - practical safety	Employer excellence projects underway and building skills for manufacture. Follow on from understanding and intrpretation of technical drawing.	Use of different measuring tools - vernier scales			Use of graphs and charts (statistical process control) in evalutaions - lean and qaulity level 3 unit	Willingness to reflect on their experiences. Social understanding through shared use of machines and raised awarenss of consequences for actions through safety and accuracy.	Importance of quality control and product conformity		
R016 - Manufacturing in quantity												

Practical	**Turning (Non Examination Assessment) Some studenst will progress onto milling**	Turning processes and key features and techniques. marking out techniques. Health and safety.	Follows on from turning employer excellence project and fabrication employer excellence project and production plans are underway.	Links to R014 and R015 wasting process, marking out and production planning of turned component.	Axis on lathe. Key features such as saddle, cross slide and compound slide.	Science Chemistry - materials / atoms elements and compounds Design and Technology - design,make and technical knowledge	Material Science (Unit 11) Mechanical Operations (Unit 13)	Tighter tolerance of manufacture. Development of production planning and evaluation. Milling	Rule of Law - Health and saftey at work act Legislative - H&S Technical drawing standards BS888	Safe use of machines. Workshop routines and tidy working areas		
Independent Study	Use of Seneca and Kahoots based on topics covered											

Summer 2	Key knowledge/content to learn and retain	Essential skills to acquire (Subject and generic)	Link to other units / subjects	Why this task now	Anticiplted misconceptions	Links to KS3	Links to KS5	Opportunity for stretch for high prior attainers	SMSC & British Values	Cultural Capital / Big Picture	Visit / talk opportunities	Career links
R014 - Principles of Engineering Manufacture	Topic area 1 - Manufacturing processes Topic area test ontopic area 1 and 2	Forming processes Additive Manufacture Joining processes Finishing processes	R015 - Students are required to manually process materials when perfomring manufacturing operations	Beneficial and allows for a deeper knowledge if the process' strengths and weaknesses is understood and can be applied to the product. Recapping, retreiving and securing knowledge.	Finishing processes for application Differences and processes of riveting Process steps of brazing	Science Chemistry - materials / atoms elements and compounds Design and Technology - design,make and technical knowledge	Material Science (Unit 11) Mechanical Operations (Unit 13) Computer Aided Manufacture (Unit 17)	More complex products used to determine manufacturing processes on	Legislative - Use of processes in specific usage such as automotive or aerospace	Manufacuring process usage for applications. Why these are used and what their pros and cons are. Product conformity and acheiveable tolerances	Univerity of Hull	https://education.theiet.org/secondary/careers/engineering-careers-resources/
R015 - manufacture of a one off product												
R016 - Manufacturing in quantity	Preparing for scale manufacture, production aids, standard operating proceedures and sequence of operations	Understanding of jigs, fixtures, templates, CNC and order of manufacture	R015 - students undertook planning for a one off product	Students have progressed form manufacturing a one off product so have fundamental skills to apply to manufacturing in batch or mass	Batch and mass production. Differencve between jig and fixture. G-code	Design and Technology - design,make and technical knowledge	Computer Aided Manufacture (Unit 17)	Annotation and recoding of G code	Standard operating proceedures and thier use in industry.	Automation in indusrty and its effect on workers, quality and safety		
Practical	Milling	Milling processes and key features and techniques. marking out techniques. Health and safety.	Follows on from turning as additional axis now intoduced so more difficult	Links to R014 and R015 wasting process, marking out and production planning of turned component. Builds on from X and Z axis on lathe.	Axis on Mills. Key features such as knee, motor, gearbox and head.	Science Chemistry - materials / atoms elements and compounds Design and Technology - design,make and technical knowledge	Material Science (Unit 11) Mechanical Operations (Unit 13)	Tighter tolerance of manufacture. Development of production planning and evaluation. Milling	Rule of Law - Health and saftey at work act Legislative - H&S Technical drawing standards BS888	Safe use of machines. Workshop routines and tidy working areas		
Independent Study	Use of Seneca and Kahoots based on topics covered											

YEAR 11

Autumn 1	Key knowledge/content to learn and retain	Essential skills to acquire (Subject and generic)	Link to other units / subjects	Why this task now	Anticiplted misconceptions	Links to KS3	Links to KS5	Opportunity for stretch for high prior attainers	SMSC & British Values	Cultural Capital / Big Picture	Visit / talk opportunities	Career links
R014 - Principles of Engineering Manufacture	Topic Area 3 Manufacturing requirements 3.2 Influence of the scale of manufacture on the production method	Scales of manufacture - one-off, batch and mass Advantages and limitations of jigs, fixtures, templates and moulds Level of automation - manual control, CAM processes, fully automated robotic control , Advantages and limitations	R016 Students are required to use CNC machines to make parts/components in quantity. R016 Students are required to use manufacturing and production aids.	Links to launch of R016 manufacturing in quantity	Difference between batch, mass and continued production - products made and why	Scales of production	Automation, control and robotics (Unit 14) Computer Aided Manufacture (Unit 17)	Consolidate knowledge of the influences on scale of manufacture, solving example problems and producing revision flash cards.	Links to globalisation and multinational companies like Airbus. Raised social awarenss of other contries and their specialisms in Engineering.	Manufacuring processes usage for small and large scale manufacture. Why these are used and what their pros and cons are. Links to globalisation and multinational companies like Airbus	BDC Machinery	https://education.theiet.org/secondary/careers/engineering-careers-resources/
R015 - manufacture of a one off product												
R016 - Manufacturing in quantity	Preparing for scale manufacture R016: NEA Assessment (working on)	Manufacture and use of production aids. Sequence of operations. Operating parameters and standard operating proceedures.	R015 Students will undertake planning for a one-off product. R014 Students will learn about the advantages and limitations of jigs, fixtures, templates, and moulds. R014 Students will learn how to read and interpret engineering drawings.	Students have already covered technical drawing and all manual machines so will now be able to understand what is needed for R016 - developed into CNC. Planning is crucial before manufacture in Autumn 2 term.	Jigs, fixtures and standard operating proceedures	Scales of production and plans for manufacture	Computer Aided Design (Unit 10) Computer Aided Manufacture (Unit 17)	Detailed SOP's development of own Go-No-Go gauges.	Links to globalisation and multinational companies like Airbus. Raised social awarenss of other contries and their specialisms in Engineering.	Manufacuring processes usage for small and large scale manufacture. Why these are used and what their pros and cons are. Links to globalisation and multinational companies like Airbus		
Practical	Milling and NEA jigs and fixture development	Milling processes and key features and techniques. marking out techniques. Health and safety.	Follows on from turning as additional axis now intoduced so more difficult	Links to R014 and R015 wasting process, marking out and production planning of turned component.	Axis on Mills. Key features such as knee, motor, gearbox and head.	Science Chemistry - materials / atoms elements and compounds Design and Technology - design,make and technical knowledge	Material Science (Unit 11) Mechanical Operations (Unit 13)	Tighter tolerance of manufacture. Development of production planning and evaluation. Milling	Rule of Law - Health and saftey at work act Legislative - H&S Technical drawing standards BS888	Safe use of machines. Workshop routines and tidy working areas		
Independent Study	Use of Seneca and Kahoots based on topics covered											

Autumn 2	Key knowledge/content to learn and retain	Essential skills to acquire (Subject and generic)	Link to other units / subjects	Why this task now	Anticiplted misconceptions	Links to KS3	Links to KS5	Opportunity for stretch for high prior attainers	SMSC & British Values	Cultural Capital / Big Picture	Visit / talk opportunities	Career links

R014 - Principles of Engineering Manufacture	Topic area 3 - Manufacturing requirements - Quality control	Reasons for implementing a quality system in engineering - early intercept of problems in production - reducing waste and associated costs - consistency of finished products - conformity to industry standards and regulations - reduce issues at customer and returns Quality control as a reactive approach, measuring parts Quality assurance as a preventative approach putting in place	R016 - Students are required to apply quality control techniques	Students are now developing code, programmes and CAD models which need to be quality controlled prior to being manufactured and after manufatcure - if fault found early (intercept) it can be recified before being started on the CNC machine and potentially stopping damage.	What is quality control and quality assurance	Evaluation and measuring final components development from making tasks in KS3	Mechanical operations (Unit 13) Lean & Quality (Unit 19)	Statictical process control moving range charts - links to lean and quality unit in Y13	Links to globalisation and multinational companies like Airbus. Raised social awarenss of other contries and their specialisms in Engineering. Rule of law and iunternational standards such as BS, ISO and AS9100	Manufacuring processes usage for small and large scale manufacture. Why these are used and what their pros and cons are. Links to globalisation and multinational companies like Airbus	McCain	https://education.theiet.org/secondary/careers/engineering-careers-resources/
R015 - manufacture of a one off product												
R016 - Manufacturing in quantity	CAD/CAM programming	Use of CAD software, develop programmes to operate CNC equipment	R014 Students will learn how to interpret engineering drawings. R015 Students will interpret engineering drawings for one-off manufacture.	Follows on from planning conducted in Autumn 1 term, utilises R014 quality unit to aid successfull development of codes, jigs, fixtures and final products.	G code and machine set up. Datums, tool setup and offsets	Students have developed skills on manual machines and have develoed understanding of how they work which can now be built upon - difficulty has now increased	Computer Aided Design (Unit 10) Computer Aided Manufacture (Unit 17)	Long hand G code development to edit key features linsk to CAM unit 17 in Y13	Links to globalisation and multinational companies like Airbus. Raised social awarenss of other contries and their specialisms in Engineering.	Manufacuring processes usage for small and large scale manufacture. Why these are used and what their pros and cons are. Links to globalisation and multinational companies like Airbus		
Practical	CNC 3D printing & router and NEA for R016	Machine set up and operation	R014, R015 and R016	Students have developed skills on manual machines and have develoed understanding of how they work which can now be built upon - difficulty has now increased			Computer Aided Manufacture (Unit 17)					
Independent Study	Use of Seneca and Kahoots based on topics covered											

Spring 1	Key knowledge/content to learn and retain	Essential skills to acquire (Subject and generic)	Link to other units / subjects	Why this task now	Anticiplted misconceptions	Links to KS3	Links to KS5	Opportunity for stretch for high prior attainers	SMSC & British Values	Cultural Capital / Big Picture	Visit / talk opportunities	Career links
R014 - Principles of Engineering Manufacture	Topic area 4 Developments in engineering manufacture 4.1 Inventory management 4.2 lean manufacturing	Just in time (JIT) manufacturing Material requirements planning (MRP) The seven categories of waste - transportation - inventory - movement - waiting - over-processing - over-production - defects How reducing each waste improves the performance of manufacturing	NA for this topic area	Develops on from quality control topic areas, as TIMWOOD and lean manufacturing rely on knowldeg of quality control to be implemented successfully.	Waste reduction in TIMWOOD Materials requirement planning Just in Time manuafcture	NA for this topic area	Lean & Quality (Unit 19)	Investigate Kaizen, Poke-Yoke and Kanban	Waste reduction - social and ethical considerations	How to reduce waste in manufacture and how to increase efficiency in production	Nissan Sunderland	https://education.theiet.org/secondary/careers/engineering-careers-resources/
R015 - manufacture of a one off product												
R016 - Manufacturing in quantity	CNC machine operation and applying quality control	Safely use CNC machiens to manufatcure products in quantity	R014, R015 and R016	Students have generated code for R016 and now operating CNC machines utilising skills from Y10 and Y11 so far	**G code and machine set up. Datums, tool setup and offsets**	Students have developed skills on manual machines and have develoed understanding of how they work which can now be built upon - difficulty has now increased	Computer Aided Design (Unit 10) Computer Aided Manufacture (Unit 17)	Long hand G code development to edit key features linsk to CAM unit 17 in Y13	Links to globalisation and multinational companies like Airbus. Raised social awarenss of other contries and their specialisms in Engineering.	Manufacuring processes usage for small and large scale manufacture. Why these are used and what their pros and cons are. Links to globalisation and multinational companies like Airbus		
Practical	CNC turning & milling and R016 NEA	Machine set up and operation					Computer Aided Manufacture (Unit 17)					
Independent Study	Use of Seneca and Kahoots based on topics covered											

Spring 2	Key knowledge/content to learn and retain	Essential skills to acquire (Subject and generic)	Link to other units / subjects	Why this task now	Anticiplted misconceptions	Links to KS3	Links to KS5	Opportunity for stretch for high prior attainers	SMSC & British Values	Cultural Capital / Big Picture	Visit / talk opportunities	Career links

R014 - Principles of Engineering Manufacture	Topic area 4 Developments in engineering manufacture 4.3 Globalisation	Requirement for transportation International standards Influence on employment opportunities Differences in employment conditions Influence on product cost Implications for sustainability Consideration of economic, social, ethical and environmental implications	NA for this topic area	Develops on from lean manufacture as globalisation developed from lean principles	Countries having specialisms. Manufacturing costs. Effects on workforce and effects on conditions.	NA for this topic area	Lean & Quality (Unit 19)	Develop case study on multinational organisations like Airbus or Toyota	Links to globalisation and multinational companies like Airbus. Raised social awarenss of other contries and their specialisms in Engineering.	Manufacuring processes usage for small and large scale manufacture. Why these are used and what their pros and cons are. Links to globalisation and multinational companies like Airbus	Not applicable in this term due to coursework deadlines and examinations	https://education.theiet.org/secondary/careers/engineering-careers-resources/
R015 - manufacture of a one off product												
R016 - Manufacturing in quantity	R016 NEA completion and quality control	CNC Setup and operation Quality control activities	R014, R015 and R016	Students will be operating machines fro the codes they have geneated and will be quality controlling them as manufatcure takes place	SPC charts	Evaluation aspect of KS3 D&T	Computer Aided Design (Unit 10) Computer Aided Manufacture (Unit 17)	SPC moving range chart generation and interpretation	International standards, social and enviromental awareness of reducing waste	Assessing of quality of components and critical analysis and evaluation of products.		
Practical	NEA R016											
Independent Study	Use of Seneca and Kahoots based on topics covered											

Summer 1	**Key knowledge/content to learn and retain**	**Essential skills to acquire (Subject and generic)**	**Link to other units / subjects**	**Why this task now**	**Anticiplted misconceptions**	**Links to KS3**	**Links to KS5**	**Opportunity for stretch for high prior attainers**	**SMSC & British Values**	**Cultural Capital / Big Picture**	**Visit / talk opportunities**	**Career links**
R014 - Principles of Engineering Manufacture	Revison, recap and retrevial of all topic areas		R015, R016, R038, R039, R040	Prior to examination at end of key stage	NA	NA	NA	self developed revision guide or flash cards	NA	NA	Not applicable in this term due to coursework deadlines and examinations	https://education.theiet.org/secondary/careers/engineering-careers-resources/
R015 - manufacture of a one off product												
R016 - Manufacturing in quantity	CNC Setup and operation Quality control activities NEA prep for submission		R014, R015 and R016	R016 due for submission in May	NA	NA	Computer Aided Design (Unit 10) Computer Aided Manufacture (Unit 17)	Working towards and in upper mark bands	NA	NA		
Practical	NEA R016											
Independent Study	Use of Seneca and Kahoots based on topics covered											

Summer 2	**Key knowledge/content to learn and retain**	**Essential skills to acquire (Subject and generic)**	**Link to other units / subjects**	**Why this task now**	**Anticiplted misconceptions**	**Links to KS3**	**Links to KS5**	**Opportunity for stretch for high prior attainers**	**SMSC & British Values**	**Cultural Capital / Big Picture**	**Visit / talk opportunities**	**Career links**
R014 - Principles of Engineering Manufacture												https://education.theiet.org/secondary/careers/engineering-careers-resources/
R015 - manufacture of a one off product												
R016 - Manufacturing in quantity												
Practical												
Independent Study												