



A 14-19 ENGINEERING ACADEMY

Welcome to University Technical College Warrington

Open Evening
Thursday 4th February, 2016

Welcome

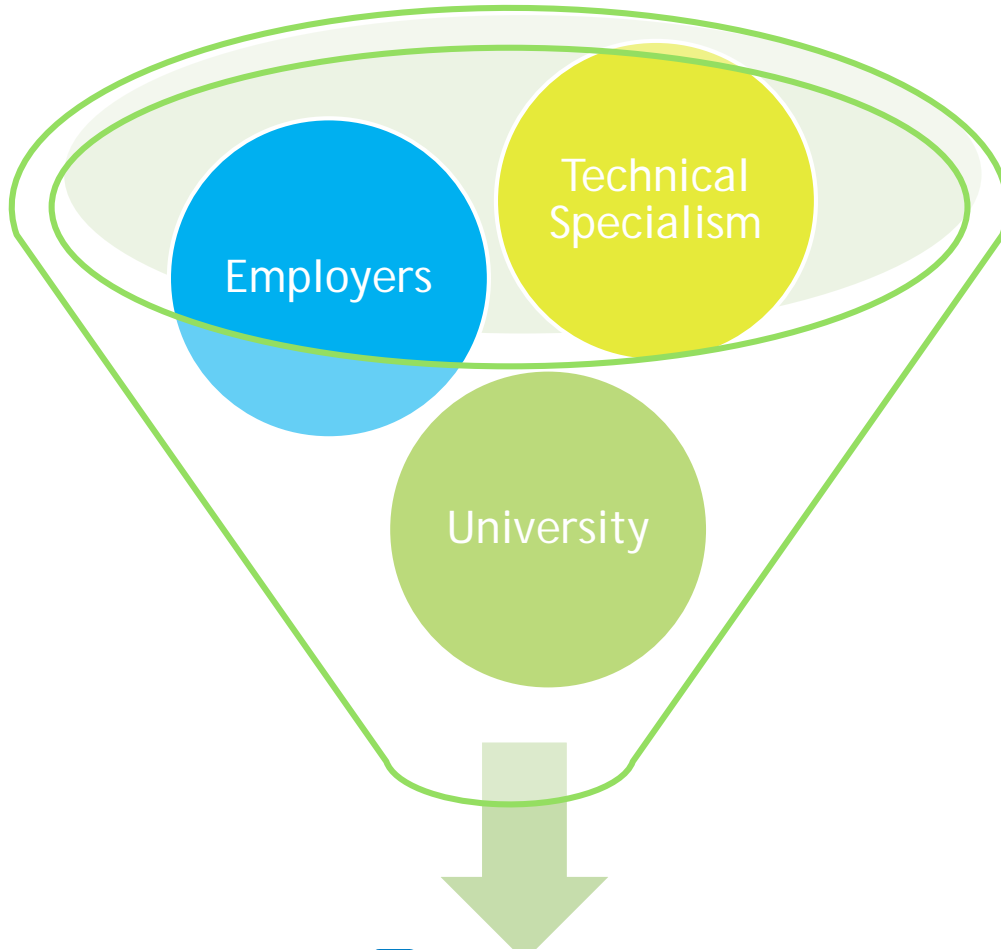


Lee Barber
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www.utcwarrington.org





What is a University Technical College?



Manchester Metropolitan University



amec foster wheeler



ATKINS



Rolls-Royce®



University Technical Colleges®



UK

UTCW Facilities

- UTCW will open in September 2016
- Adjacent to Warrington Bus Station, Warrington Central train station
- Part of the Stadium Quarter development
- £10m build programme; 6 storey, iconic building
- £1m Specialist Engineering equipment
- £1m ICT equipment and fit-out
- 3 catering facilities

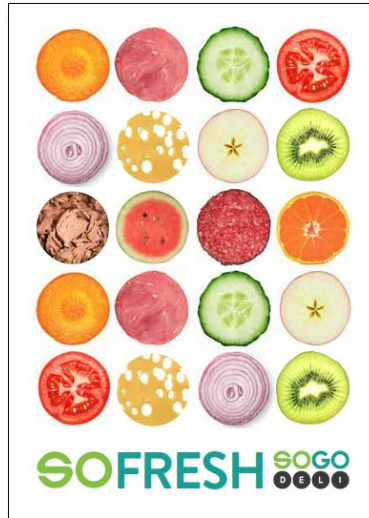




1st Floor

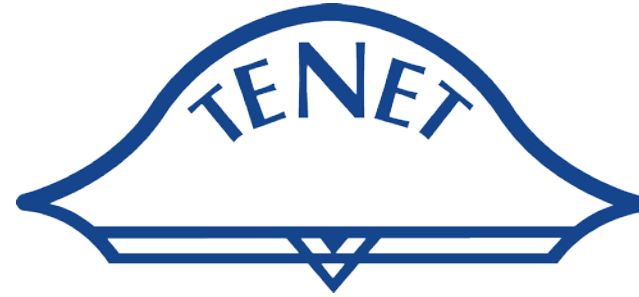
3rd Floor

5th Floor



What is the Employer Input?

- Ensure the next generation has the expertise, employability skills and knowledge
- Meet the future needs of industry
- Identify the skills shortages in Warrington
- Supply a pipeline of talent into industry.



Employers...

- Create **real-life challenges** and projects to apply learning
- Give students high-quality and relevant **work experience**
- Provide access to their facilities to **inspire** and inform students
- Ensure that the curriculum gives students the **technical** and **soft skills** they need in the workplace.



A 14-19 ENGINEERING ACADEMY

Skill Pinch Points (NSAN)



1	Project and Programme Management	ECITB
2	Quality Assurance and Quality Control	NSAN / NSAN-M
3	Manufacturing Engineers	Semta / Nuclear AMRC / NSAN-M
4	Design Engineers	NSAN-M
5	R&D, Subject Matter Experts	Dalton
6	Steelfixing	CITB
7	Construction Engineers	CITB
8	Concreters	CITB
9	Scaffolding	CITB
10	Civil Engineering Operatives	CITB
11	Construction Supervisors	ECITB
12	High Integrity Welders	ECITB
13	Control and Instrumentation	CITB
14	Human Performance and Human Factors	NSAN
15	Safety Case Specialists	NSAN
16	ONR Regulators	NSAN
17	Reactor Chemists and Reactor Physicists	Dalton
18	Non Destructive Testing	ECITB / Semta

Year 10 & 11 curriculum

All students follow the academic core and choose one course from the technical core. Then students have two remaining choices from the options.



Technical Pathway:

Select an AQA Tech A Level* in:

- a) Mechatronic Engineering
- b) Design Engineering
- c) Power Network Engineering

* 1 or 2 A Levels

or

Select BTEC* in:

- a) Mechanical Engineering
- b) Electrical & Electronic Engineering
- c) Computer Engineering
- d) Aeronautical Engineering
- e) Manufacture Engineering

* 1, 2 or 3 A Levels

+

Core Maths (Level 3)

+

Extended Project Qualification

Hybrid option
(Select from both)



A 14-19 ENGINEERING ACADEMY

Academic Pathway:

Select 4 A Levels from:

- Engineering
- Maths
- Physics
- Chemistry
- Biology
- Computer Science
- Design and Technology
- English

Professional Qualifications:

- Project Management
- Autodesk
- Adobe
- Health & Safety
- BIM
- REVIT

Employer Engagement:

- Work Experience
- Master Classes
- Technical Challenges
- Site Visits
- Mentoring/Coaching
- CV/Interview practice

Enrichment:

- Green Kart Racing
- Coding
- STEM Ambassador
- Mandarin
- Duke of Edinburgh
- Young Enterprise
- Sport & Wellbeing

GCSE Engineering Courses

Systems & Control

Learning Outcome 1: Be able to use CAD for circuit simulation and design

Learners must be taught:

- circuit schematic diagram drawing using CAD software
- circuit simulation and test using CAD software
- PCB layout production to include both track and component views (e.g. export of schematic diagrams, use of component libraries)

Learning Outcome 2: Be able to construct circuits

Learners must be taught:

- safe use of manually-operated hand tools, i.e.
 - soldering iron
 - wire cutters
 - wire strippers
 - pliers
 - screwdrivers
 - de-soldering tools
 - manual/PCB drills
 - appropriate PPE
- circuit construction following circuit diagram(s) (e.g. transistor circuits using sensors and switches, alarm circuits, audio circuits, optical circuits, counting circuits, logic circuits)
- safe construction of PCBs (e.g. photoresist methods, etch resist methods, engraving)
- circuit construction using appropriate methods (e.g. component assembly, PCB soldering techniques, heat sinks for delicate components)
- construction techniques for joining external components, i.e.
 - soldering
 - connecting between boards (e.g. ribbon cable, connecting plugs and sockets, PCB to case fittings, sleeves, insulation, heat shrink, screw terminals)

Engineering Principles

Learning Outcome 1: Know about engineering sectors, their products and services

Learners must be taught:

- services and products of different sectors within engineering e.g.
 - aerospace (e.g. aircraft; satellites; military equipment)
 - automotive (e.g. cars; motor bikes; trucks; bus; agricultural; plant)
 - electronics (e.g. communication; systems control; information technology)
 - marine (e.g. commercial ships; military vessels; coastal services)
 - rail (e.g. passenger trains; freight transport; rail network)
 - metals (e.g. mining; processing; metals recovery)
 - chemical (e.g. industrial; domestic; medical; polymers; paints)
 - process (e.g. food; textiles; electrical goods)
 - civil (e.g. construction; roads/bridges; rail networks)
 - medical (e.g. pharmaceuticals; bio; orthopaedic; prosthetics)
 - utilities (e.g. electricity; gas, water, communication)

Learning Outcome 2: Understand how engineering companies operate

Learners must be taught:

- characteristics of engineering companies, i.e.
 - size (e.g. micro; small and medium enterprises (SME); large)
 - structure (e.g. flat; hierarchy; pyramid)
 - functions (e.g. Human Resources (HR); sales; marketing; production; finance)
 - scope of operation (e.g. local; national; global)
- relationships within the engineering market place, i.e.
 - competitors in the same engineering market
 - suppliers, and supply chain companies working together
 - partners working in the same engineering market

GCSE Engineering Courses

Engineering Manufacture

Learning Outcome 2: Understand engineering processes and their application

Learners must be taught:

- basic engineering processes, i.e.
 - material removal, i.e.
 - sawing
 - filing
 - threading
 - hand forming, i.e.
 - forging
 - casting
 - bending
 - joining methods, i.e.
 - soldering
 - brazing
 - welding
 - riveting
 - adhesives
 - threaded fasteners
 - self-tapping screws
 - heat treatment, i.e.
 - hardening and tempering
 - case hardening
 - annealing
 - normalising
 - nitriding
 - surface finishing, i.e.
 - finishing
 - polishing
 - plastic/powder coating
 - painting
 - electroplating
 - galvanising
- machine processes, i.e.
 - material removal, i.e.
 - drilling
 - turning
 - milling
 - grinding
 - forming, i.e.
 - die and investment casting
 - shell moulding
 - forging
 - extrusion
 - press forming
 - moulding, i.e.
 - vacuum forming
 - injection moulding
 - blow moulding
 - rotational moulding
 - compression moulding
- safe use of tools and equipment, i.e.
 - features and controls of machines
 - risk assessment
 - appropriate use of Personal Protective Equipment (PPE)
 - safety precautions

Engineering Design

Learning Outcome 2: Understand the requirements of design specifications for the development of a new product

Learners must be taught:

- requirements of a design specification, i.e.
 - user needs, i.e.
 - aesthetics
 - ergonomics
 - anthropometrics
 - benefits and features
 - product safety
 - product requirements, i.e.
 - function
 - features
 - performance
 - target group/intended users
 - working environment
 - limitations and constraints, size, weight, functional limitations
 - appearance
 - ergonomics
 - lifecycle
 - manufacturing considerations, i.e.
 - materials availability/supply chain
 - ease of manufacture, i.e.
 - standard components
 - pre-manufactured components
 - design for manufacturing assembly (DFMA)
 - design for disassembly
 - manufacturing processes
 - scale of production, i.e.
 - prototyping
 - one off – batch – mass production
 - durability and reliability
 - tolerances
 - product safety
 - sustainability
 - maintenance
 - production costs
 - regulations and safeguards, i.e.
 - copyright
 - patents
 - registered designs
 - trademarks
 - British Standards
 - European Conformity (EC)

Engineering Courses

Design Engineering

- ▶ 1 Materials Technology and Science
- ▶ 2 Mechanical Systems
- ▶ 3 Mathematics for Engineers
- ▶ 4 Engineering Design
- ▶ 5 Production & Manufacturing
- ▶ 6 Design Visualisation
- ▶ 7 Advanced Design for Manufacture
- ▶ 8 Design Engineer Project Management

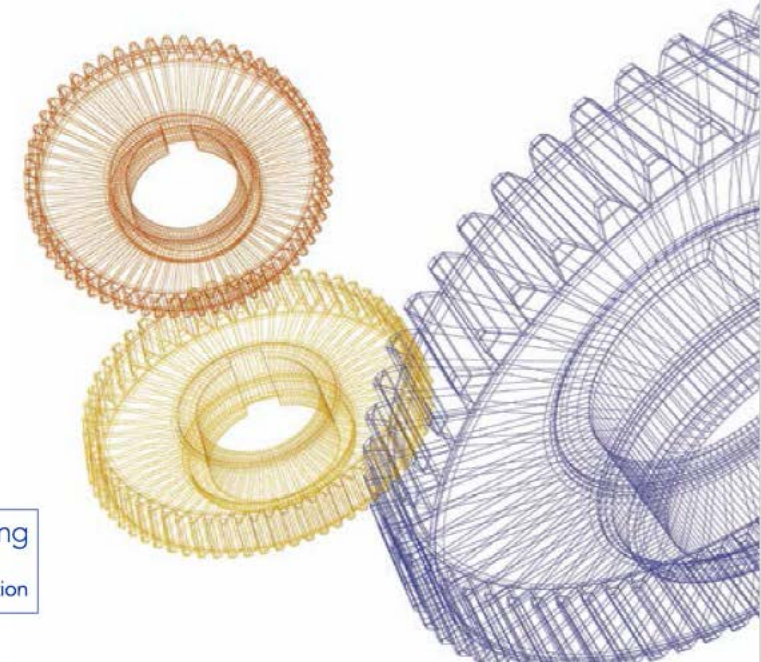
LEVEL 3 TECHNICAL LEVEL ENGINEERING: DESIGN ENGINEERING

(TVQ01003)

Specification

First registration September 2015 onwards

Version 1.1 January 2015



Engineering Courses

Power Network Engineering

- ▶ 1 Materials Technology and Science
- ▶ 2 Mechanical Systems
- ▶ 3 Mathematics for Engineers
- ▶ 4 Electrical Power Systems
- ▶ 5 UK Electricity Industry
- ▶ 6 Electrical Power - Generation
- ▶ 7 Electrical Power - Transmission Networks
- ▶ 8 Electrical Power - Distribution Networks

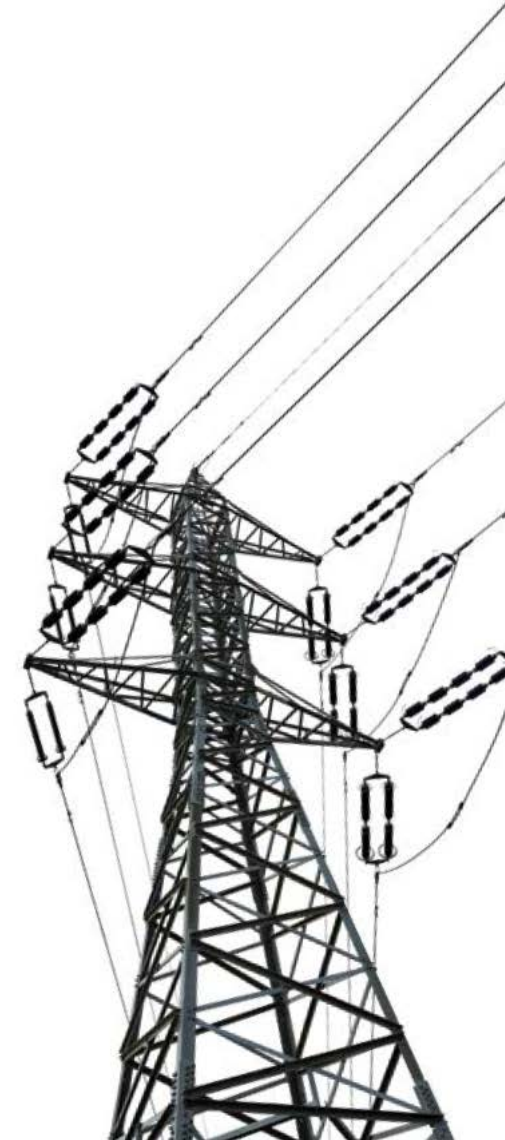
LEVEL 3 TECHNICAL LEVEL ENGINEERING: POWER NETWORK ENGINEERING

(TVQ01002)

Specification

First registration September 2015 onwards

Version 1.1 January 2015



Engineering Courses

Mechatronics

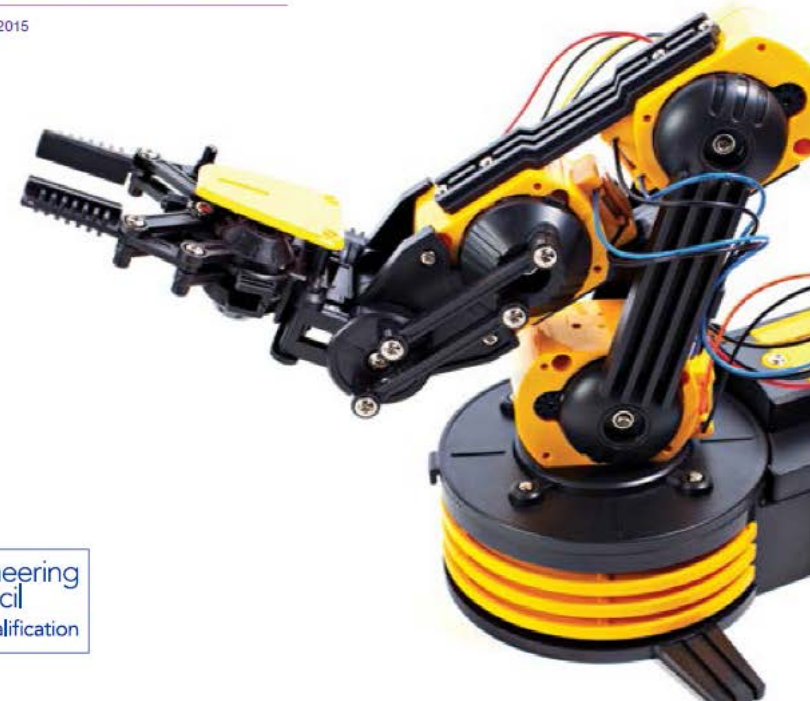
- ▶ 1 Materials Technology and Science
- ▶ 2 Mechanical Systems
- ▶ 3 Mathematics for Engineers
- ▶ 4 Engineering Design
- ▶ 5 Production & Manufacturing
- ▶ 6 Mechatronic Project Management
- ▶ 7 Mechatronic Control Systems
- ▶ 8 Programming for Engineers

LEVEL 3
TECHNICAL
LEVEL
**ENGINEERING:
MECHATRONIC
ENGINEERING**
(TVQ01001)

Specification

First registration September 2015 onwards

Version 1.1 January 2015



Unit (number and title)	Unit size (GLH)	Extended Certificate (360 GLH)	Foundation Diploma (540 GLH)	Diploma (720 GLH)						Extended Diploma (1080 GLH)					
				E	EE	ME	C	MA	AE	E	EE	ME	C	MA	AE
13 Welding Technology	60		0	0		0		0	0	0		0		0	0
14 Electrical Installation of Hardware and Cables	60			0	0		0			0	0		0	0	
15 Electrical Machines	60		0	0	0	0	0		0	0	0	0	0		0
16 Three Phase Electrical Systems	60			0	0		0	0	0	0	0		0	0	0
17 Power and Energy Electronics	60			0	0					0	0				
18 Electrical Power Distribution and Transmission	60			0	0		0			0	0	0	0		
19 Electronic Devices and Circuits	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20 Analogue Electronic Circuits	60			0	0	0	0			0	0	0	0		
21 Electronic Measurement and Testing of Circuits	60		0	0	0	0	0			0	0	0	0	0	0
22 Electronic Printed Circuit Board Design and Manufacture	60		0	0	0		0	0		0	0		0	0	
23 Digital and Analogue Electronic Systems	60			0	0					0	0				
24 Maintenance of Mechanical Systems	60		0	0	0	0	0	0		0	0	0	0	0	
25 Mechanical Behaviour of Metallic Materials	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26 Mechanical Behaviour of Non-Metallic Materials	60			0		0		0	0	0	0	0		0	0
27 Static Mechanical Principles in Practice	60		0	0	0	0	0	0		0	0	0	0	0	
28 Dynamic Mechanical Principles in Practice	60			0		0		0		0	0	0		0	0
29 Principles and Applications of Fluid Mechanics	60			0		0			0	0		0		0	0
30 Mechanical Measurement and Inspection Technology	60	0	0	0	0	0		0		0	0	0	0	0	

Unit (number and title)	Unit size (GLH)	Extended Certificate (360 GLH)	Foundation Diploma (540 GLH)	Diploma (720 GLH)						Extended Diploma (1080 GLH)					
				E	EE	ME	C	MA	AE	E	EE	ME	C	MA	AE
				31 Thermodynamic Principles and Practice	60			O		O			O	O	
32 Computer System Principles and Practice	60			O			M			O			M		
33 Computer Systems Security	60			O	O		O			O	O	O	O		
34 Computer Systems Support and Performance	60			O	O	O	O	O		O	O	O	O	O	
35 Computer Programming	60	O	O	O	O	O	O	O	O	O	O	O	O	O	O
36 Programmable Logic Controllers	60		O	O	O	O	O	O	O	O	O	O	O	O	O
37 Computer Networks	60			O	O		O			O	O		O		
38 Website Production to Control Devices	60			O	O		O			O	O		O		
39 Modern Manufacturing Systems	60			O				M		O				M	
40 Computer Aided Manufacturing and Planning	60			O			O	O		O		O	O	O	
41 Manufacturing Secondary Machining Processes	60	O	O	O	O	O	O	O	O	O	O	O	O	O	O
42 Manufacturing Primary Forming Processes	60			O		O		O		O		O		O	
43 Manufacturing Computer Numerical Control Machining Processes	60		O	O	O	O	O	O	O	O	O	O	O	O	O
44 Fabrication Manufacturing Processes	60	O	O	O	O	O		O		O	O	O		O	O
45 Additive Manufacturing Processes	60	O	O	O	O	O	O	O	O	O	O	O	O	O	O
46 Manufacturing Joining, Finishing and Assembly Processes	60			O				O		O				O	
47 Composites Manufacture and Repair Processes	60			O				O	O	O				O	O
48 Aircraft Flight Principles and Practice	60								M						M
49 Aircraft Workshop Methods and Practice	60								O						O

Unit (number and title)	Unit size (GLH)	Extended Certificate (360 GLH)	Foundation Diploma (540 GLH)	Diploma (720 GLH)						Extended Diploma (1080 GLH)					
				E	EE	ME	C	MA	AE	E	EE	ME	C	MA	AE
50 Aircraft Gas Turbine Engines	60								0						0
51 Aircraft Propulsion Systems	60								0						0
52 Airframe Construction and Repair	60								0						0
53 Airframe Mechanical Systems	60								0						0
54 Aircraft Electrical and Instrument Systems	60								0						0
55 Aircraft First Line Maintenance Operations	60								0						0

Enrichment

Professional Qualifications:

- ✓ City & Guilds: Project management
- ✓ Microsoft Office Specialist
 - ✓ CISQO CCENT
 - ✓ Autodesk Inventor
 - ✓ Adobe

Employer Engagement:

- ✓ Work Experience
- ✓ Engineering Master Classes
- ✓ Real-life Projects (with employers)
- ✓ Preparation for Working life

Enrichment:

- ✓ Green Kart Racing
- ✓ STEM Ambassadors
- ✓ Duke of Edinburgh Award
- ✓ Programming, Autocad
 - ✓ Young Enterprise
- ✓ Sports Leaders Award

Sample timetable

	Student A	Student B	Student C	Student D
Briefing 8.30 - 8.50am	House Assembly (Theatre)	Form: Debating/ Current Affairs	Form: Employability Skills: CV/Interview	Form: Attendance & Progress checks
Period 1 8.50 - 9.50am	Chemistry	Electronics	Biology	Design Technology (Resistant Materials)
AM Break 9.50 - 10.05am				
Period 2 10.05 - 11.05am	Physics	Technical Project Day: Sellafield Ltd	Geography	Engineering (Workshop)
Period 3 11.05 - 12.05pm	English		Maths	
Lunch 12.05 - 12.45pm				
Period 4 12.45 - 1.45pm	Engineering (Workshop)	Technical Project Day: Sellafield Ltd	Engineering Master Class: Atkins (Theatre)	Engineering (Lab)
Period 5 1.45 - 2.45pm				Computer Science (Lab)
PM Break 2.45 - 3.00pm				
Period 6 3.00 - 4.00pm	Design Technology (Product Design)	English	Mandarin	PE
Enrichment 4.00 - 4.30pm	STEM Ambassadors	Green Kart Racing	Duke of Edinburgh award	Maths & English Booster session

UTC Culture

Life at UTCW...

...Business Dress code

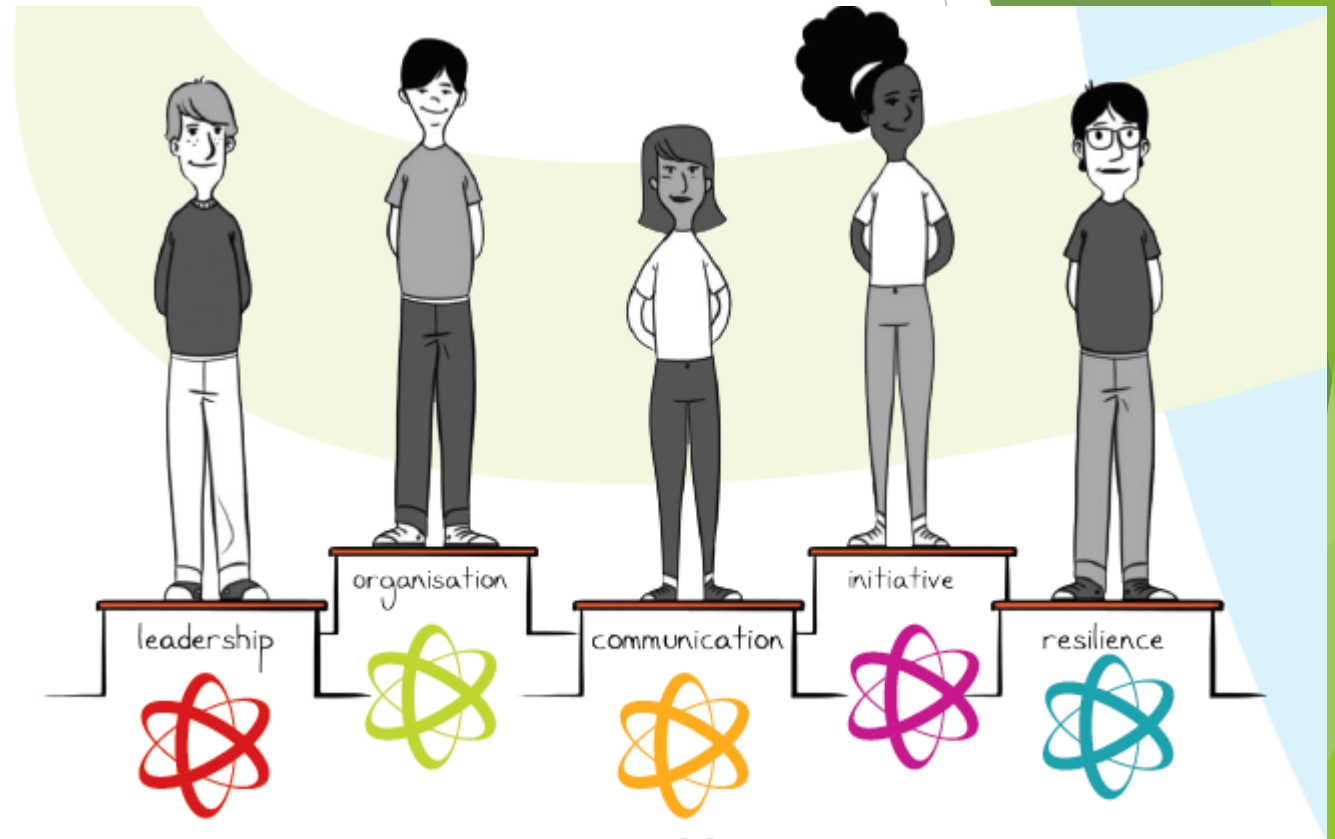
+ Soft Skills development

+ Core business hours

+ Adult environment

= Reflection of industry

= **Competitive advantage**



Senior Leadership Team

Mrs Amanda Downing

- Vice Principal
- Responsible for Student Outcomes
- Will line manage the academic curriculum
- Currently Deputy Headteacher/English Teacher
- Strong pastoral background and experience/expertise in safeguarding
- Track record of raising attainment in Maths and English departments



“Really excited about being part of new UTC model and working with employer partners to ensure that our students’ learning is modern, relevant, engaging and that their futures are bright and successful.”

Senior Leadership Team

Mr James Backhouse

- Vice Principal
- Responsible for Curriculum
- Will line manage the technical core
- Currently Vice Principal
- Chemistry Teacher
- Level 3 Safeguarding qualified
- Track record of developing specialist curriculum in 14-19 schools and engaging with employers



Senior Leadership Team

Mr Tony Wray

- Assistant Vice Principal
- Responsible for Personal Development, Behaviour and Welfare of students
- Will line manage the SENCO and support staff
- Currently lead professional for Behaviour
- PE Teacher
- Level 3 Safeguarding qualified
- Track record of developing systems to improve safeguarding, child protection and behaviour of students



Senior Leadership Team

Mrs Kris Coates

- Director of Teaching
- Responsible for quality assurance of teaching and development of teaching staff
- Will line manage Maths & English
- Currently Head of English
- English Teacher
- Track record of raising attainment in an underperforming English department



Senior Leadership Team

Mr Mark O'Donoghue

- Director of Science & Engineering
- Responsible for the delivery and development of the specialist subjects
- Will lead the Science, Engineering and Design Technology faculty
- Currently Head of Science
- Physics Teacher
- Ex Head of Year
- Ex Manufacturing & Software engineer
- Track record of delivering outstanding GCSE and A Level science results





Workshop
Zone 1
7 x 4 Group work
stations

Workshop
Zone 2
Heat Treatment
area

Workshop
Zone 3

- Training Lathes
- Turret Mills
- Plasma Cutter
- Welding Benches
- Band Saw/Chop Saw
- Chamois polisher
- Tube bender
- Bench grinder
- Morticer
- Casting Kit
- Sander

*See Flamefast drawings



Rm 107
Maths

Rm 101
Maths

Display Board

Rm 106
Maths

Rm 102
Materials Testing

1.13 Cleaners
1.14 AWC
1.15 FWC
1.16 MWC
1.08b Grab & Go
12 x Fixed iPad with power
SOGO DELI
Grab & Go

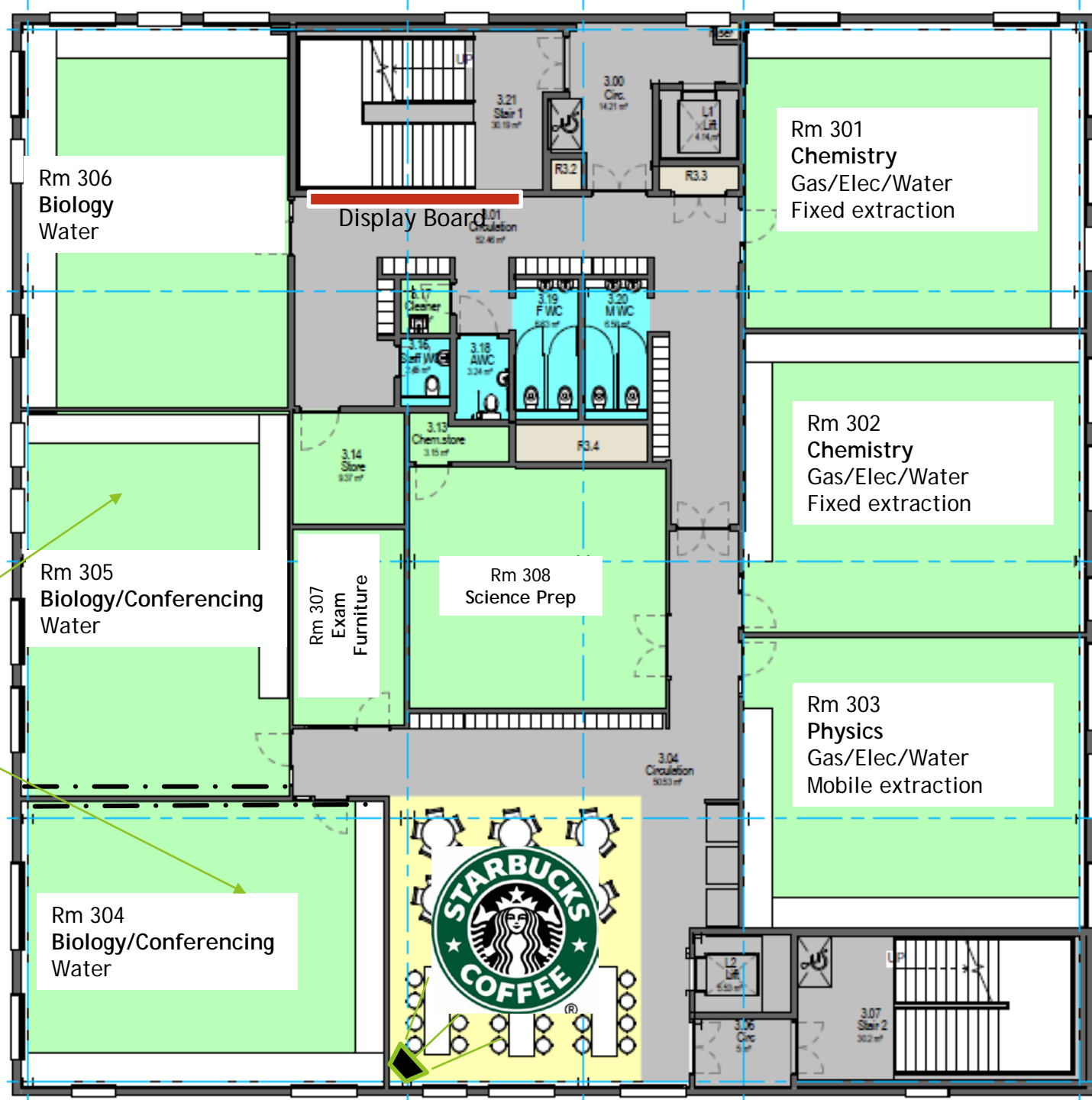
Rm 103
Plastics
7 x 4 Group tables (tough)
Perimeter Fixed benching
25 stools
1 Teacher PC
1 teacher desk/chair
1 Projector/Sound
Apple TV or similar
+
*Spec.Equip:
Plastics/3D printer

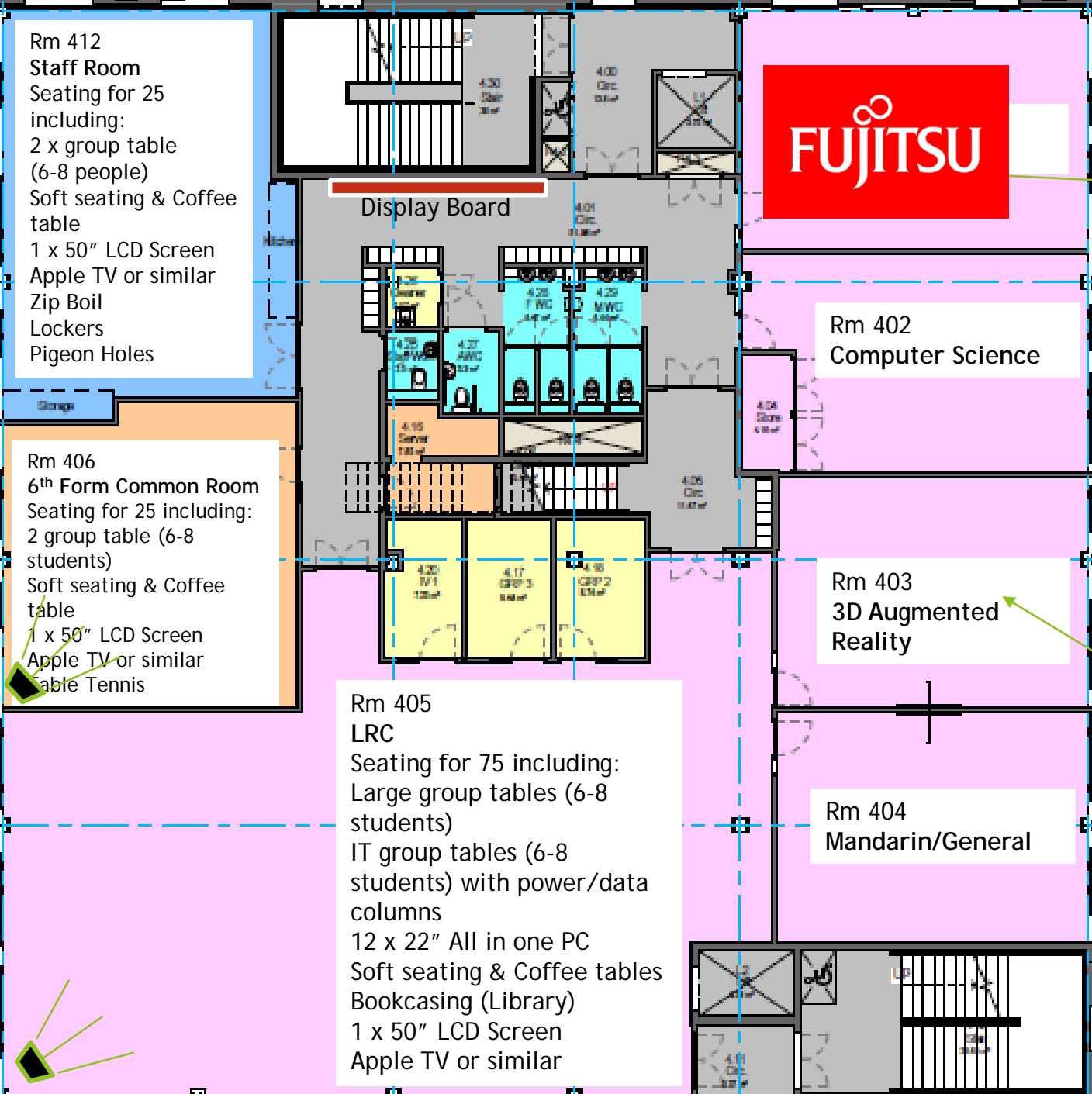
Rm 105
CAD/CAM
7 x 4 Group tables
25 x 22" all in one PC
Power/Data columns
25 stools
1 Teacher PC
1 teacher desk/chair
1 Projector/Sound
Apple TV or similar
+
*Spec.Equip:
CAD/CAM

Rm 104
Mechanical
Engineering
7 x 4 Group tables
25 x 22" all in one PC
Power/Data columns
25 stools
1 Teacher PC
1 teacher desk/chair
1 Projector/Sound
Apple TV or similar
+
*Spec.Equip:
TBC (

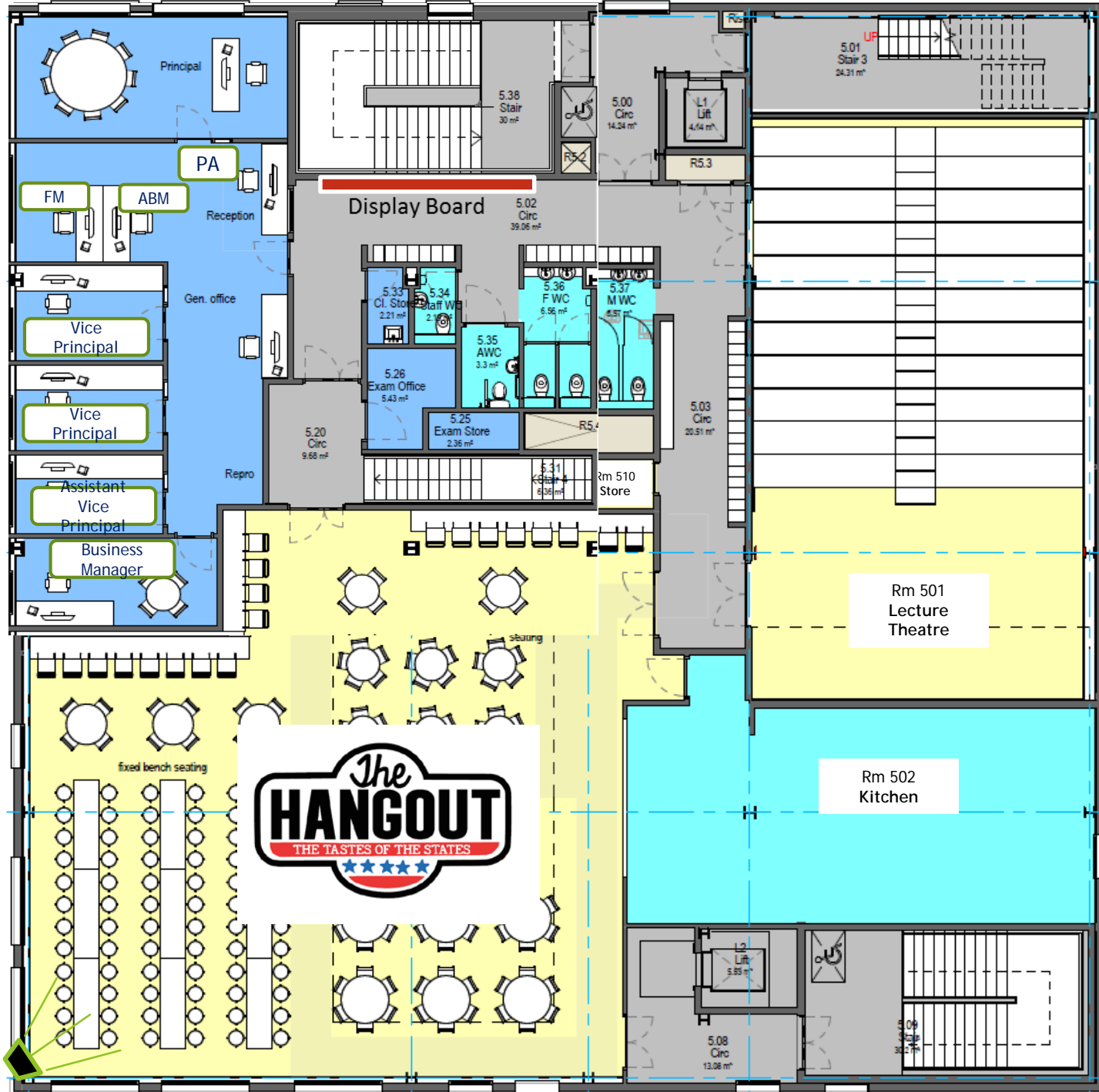






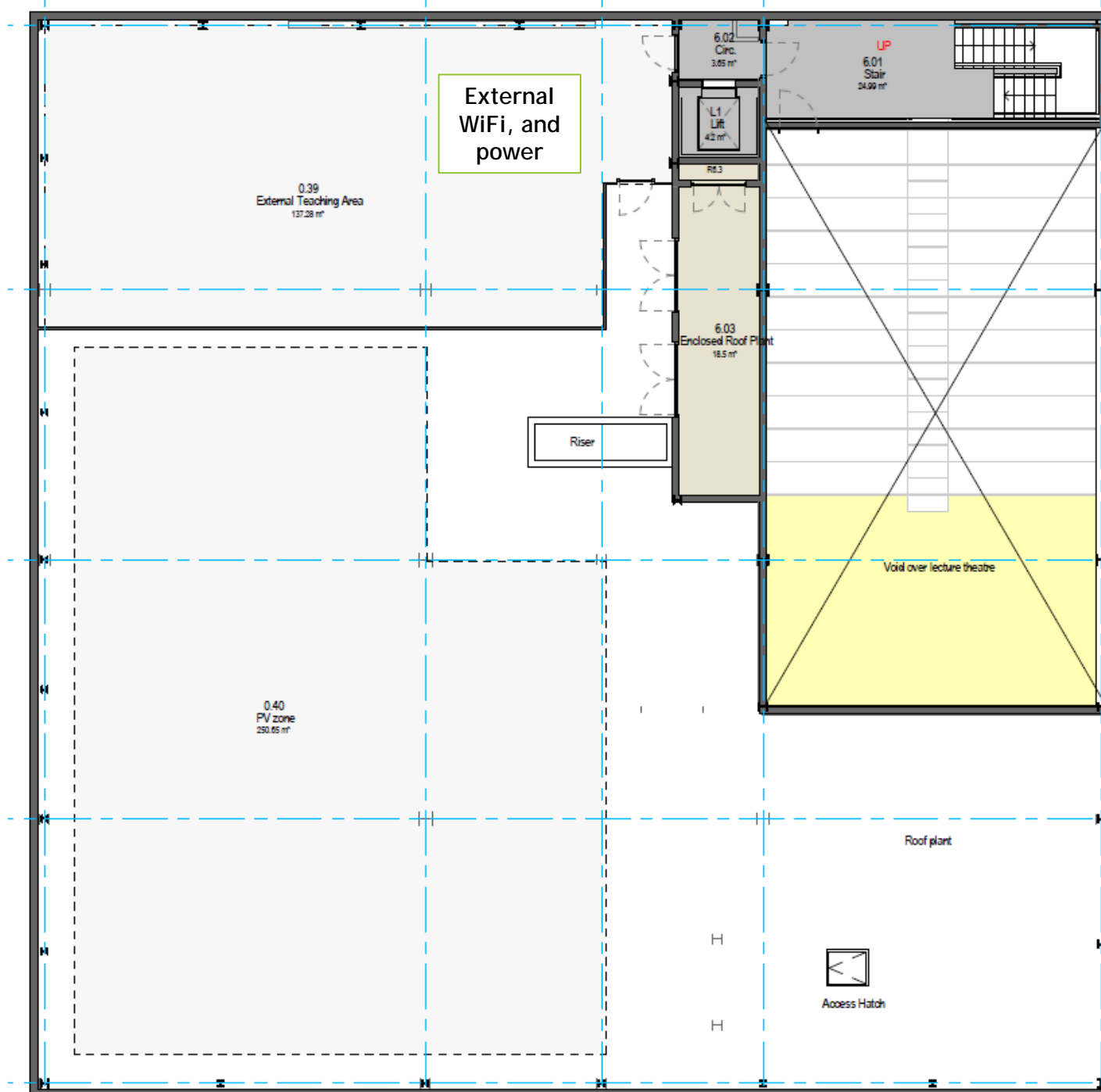






Rm 501
Lecture
Theatre

Rm 502
Kitchen



Year 9 Student

Apply for a Year 10 place to join University Technical College in September 2016

Complete an application form

Return your application form to **Warrington Borough Council**

How to apply

UTC Warrington is open to applications from students from across Warrington and surrounding areas. There are two points at which you can become a UTC Warrington student. Students can apply to join us from Year 10 onwards or from Year 12 onwards. If you are currently in Year 9 or Year 11 you can apply to be one of our very first students when we open in September 2016.

If you apply for a place before Monday 30th November 2015, you will be entered into a prize draw to win an iPad.

Application deadline:
Monday 29th February 2016.
Places offered from w/c
28th March 2016

Following receipt of your application you will be invited to attend an Information, Advice & Guidance meeting with the Principal

Once you have applied you will be invited to attend a fantastic collection of events during the current academic year to prepare you for joining UTC Warrington in September 2016

Year 11 Student

Apply for a Year 12 place to join University Technical College in September 2016

Complete an application form

Return your application form to **UTC Warrington**



UTCW Recruitment Timeline

- ▶ Open Event - Thursday 4th February, 5.30pm - 8pm
- ▶ Application closing date - **Monday 29th February 2016**
- ▶ Places offered from: Week commencing 28th March

▶ Once offers are made w/c 28th March 2016....

- ▶ Taster Days
- ▶ Teambuilding activities
- ▶ Fresher's Fair
- ▶ Timetabling meetings

-
- ▶ Enrolment for ALL students: **Thursday 25th August 2016**
 - ▶ Opening Day: Monday 5th September 2016



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