Design and Technology

Introduction to A Level theoretical studies

Material in support of the written examinations

Course overview

AQA A Level Design and Technology is a two year linear course where you sit two written examinations in the summer of the final year. These two examinations constitute 50% of your A Level.

The remaining 50% is from the Non-Examination Assessment (NEA) which is a substantial design task with a portfolio of design work and prototype outcome(s).

While the study of materials and processes will support your work in the NEA, lessons will be scheduled where you will learn the theoretical content necessary for the examination. These will often be referred to as 'theory' lessons.

Learning outcomes

The theory will be taught in around 60 lessons over the course of the two years alongside your practical design based lessons. By the end of this series of units you should have developed a knowledge and understanding of:

- Technical principles such as materials and their properties, forming processes, finishes and material enhancement, scales of production, digital design and design for manufacture, responsible product development, enterprise and intellectual property and design communication

- Design and make principles such as design processes and theory, design history, technological change, critical analysis, accuracy in design, design for manufacture and project management

Course structure

The course structure is as follows:

NEA: a substantial design and make task lasting approx. one school year. (50% of the award)

Paper 1: Technical principles (2 hours 30 mins) (30% of the award)

Paper 2: Designing and making principles (1 hour 30 mins) (20% of the award)

In these examinations, 25% of the questions will address maths and science knowledge.

Theory content

Paper 1 Technical principles (2 hours 30 mins.) 120 marks

1.1 Materials and their applications

1.2 Performance characteristics of materials

1.3 Enhancement of materials

1.4 Forming, redistribution and addition processes

1.5 The use of finishes

1.6 Modern and industrial scales of production

1.7 Digital design and manufacture

1.8 The requirements for product design and development

1.9 Health and Safety

1.10 Protecting designs and intellectual property

1.11 Design for manufacturing, maintenance, repair and disposal

1.12 Feasibility studies

1.13 Enterprise and marketing in the development of products

1.14 Design communication

Theory content

Paper 2 Designing and making principles (1 hours 30 mins.) 80 marks

2.1 Design methods and processes*

2.2 Design theory

2.3 Technology and cultural changes

2.4 Design processes*

2.5 Critical analysis and evaluation*

2.6 Selecting appropriate tools, techniques and processes*

2.7 Accuracy in design and manufacture*

2.8 Responsible design

2.9 Design for manufacturing and project management*

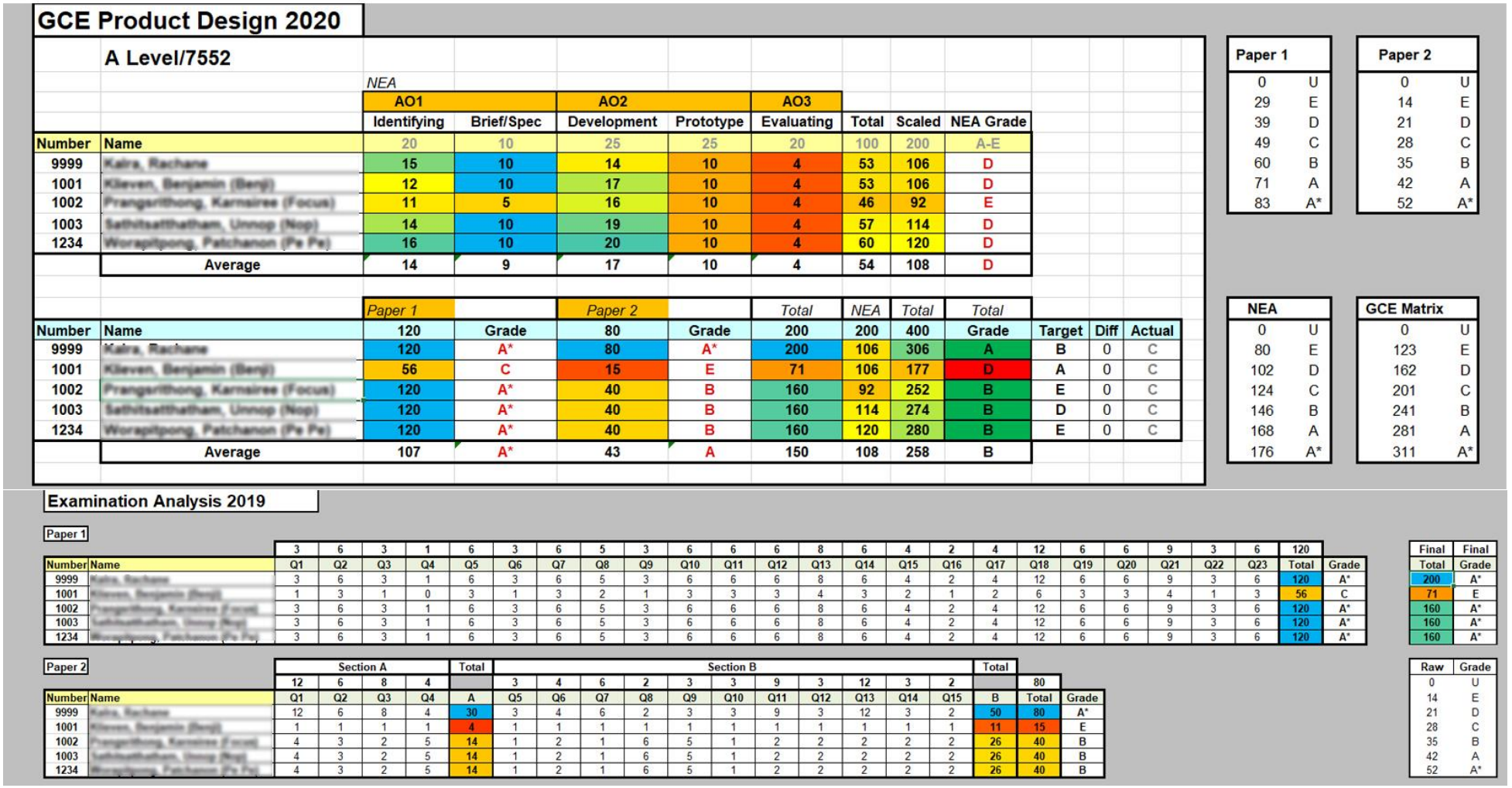
2.10 National and international standards in product design

After this unit of work is complete you will sit a full mock examination

*Much of this content will also be covered in the NEA

Assessment and tracking

Your teacher will use a comprehensive tracking system to assess your progress and provide an ongoing prediction of your final grade. This is intended to give you the opportunity to see where you can make improvements and should be used positively and productively.



GCE Product Design 2020

A Level/7552

		NEA							
		AO1		AO2		AO3			
		Identifying	Brief/Spec	Development	Prototype	Evaluating	Total	Scaled	NEA Grade
Number	Name	20	10	25	25	20	100	200	A-E
9999	Kalra, Rachane	15	10	14	10	4	53	106	D
1001	Klieven, Benjamin (Benji)	12	10	17	10	4	53	106	D
1002	Prangsrithong, Karnsiree (Focus)	11	5	16	10	4	46	92	E
1003	Sathitsatthatham, Unnop (Nop)	14	10	19	10	4	57	114	D
1234	Worapitpong, Patchanon (Pe Pe)	16	10	20	10	4	60	120	D
	Average	14	9	17	10	4	54	108	D

		Paper 1		Paper 2		Total	NEA	Total	Total			
Number	Name	120	Grade	80	Grade	200	200	400	Grade	Target	Diff	Actual
9999	Kalra, Rachane	120	A*	80	A*	200	106	306	A	B	0	C
1001	Klieven, Benjamin (Benji)	56	C	15	E	71	106	177	D	A	0	C
1002	Prangsrithong, Karnsiree (Focus)	120	A*	40	B	160	92	252	B	E	0	C
1003	Sathitsatthatham, Unnop (Nop)	120	A*	40	B	160	114	274	B	D	0	C
1234	Worapitpong, Patchanon (Pe Pe)	120	A*	40	B	160	120	280	B	E	0	C
	Average	107	A*	43	A	150	108	258	B			

Paper 1	
0	U
29	E
39	D
49	C
60	B
71	A
83	A*

Paper 2	
0	U
14	E
21	D
28	C
35	B
42	A
52	A*

NEA	
0	U
80	E
102	D
124	C
146	B
168	A
176	A*

GCE Matrix	
0	U
123	E
162	D
201	C
241	B
281	A
311	A*

Examination Analysis 2019

Paper 1

		3	6	3	1	6	3	6	5	3	6	6	6	8	6	4	2	4	12	6	6	9	3	6	120	
Number	Name	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Total	Grade
9999	Kalra, Rachane	3	6	3	1	6	3	6	5	3	6	6	6	8	6	4	2	4	12	6	6	9	3	6	120	A*
1001	Klieven, Benjamin (Benji)	1	3	1	0	3	1	3	2	1	3	3	3	4	3	2	1	2	6	3	3	4	1	3	56	C
1002	Prangsrithong, Karnsiree (Focus)	3	6	3	1	6	3	6	5	3	6	6	6	8	6	4	2	4	12	6	6	9	3	6	120	A*
1003	Sathitsatthatham, Unnop (Nop)	3	6	3	1	6	3	6	5	3	6	6	6	8	6	4	2	4	12	6	6	9	3	6	120	A*
1234	Worapitpong, Patchanon (Pe Pe)	3	6	3	1	6	3	6	5	3	6	6	6	8	6	4	2	4	12	6	6	9	3	6	120	A*

Final Total	Final Grade
200	A*
71	E
160	A*
160	A*
160	A*

Paper 2

		Section A				Total	Section B										Total		
		12	6	8	4		3	4	6	2	3	3	9	3	12	3	2		80	
Number	Name	Q1	Q2	Q3	Q4	A	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	B	Total	Grade
9999	Kalra, Rachane	12	6	8	4	30	3	4	6	2	3	3	9	3	12	3	2	50	80	A*
1001	Klieven, Benjamin (Benji)	1	1	1	1	4	1	1	1	1	1	1	1	1	1	1	1	11	15	E
1002	Prangsrithong, Karnsiree (Focus)	4	3	2	5	14	1	2	1	6	5	1	2	2	2	2	2	26	40	B
1003	Sathitsatthatham, Unnop (Nop)	4	3	2	5	14	1	2	1	6	5	1	2	2	2	2	2	26	40	B
1234	Worapitpong, Patchanon (Pe Pe)	4	3	2	5	14	1	2	1	6	5	1	2	2	2	2	2	26	40	B

Raw	Grade
0	U
14	E
21	D
28	C
35	B
42	A
52	A*

Assessment and tracking

For each unit covered you will be given a past paper question to test your knowledge. The marks from these will be entered into a spreadsheet and an average of your results will be tracked throughout the course. At the end of each full section, you will sit a past paper.

Assessment by section

Number	Name	Course introduction and content	Wood	Metal	Polymer	Paper	Composite	Smart/Modern	Testing	Classification/stock forms	Physical/Mechanical	Enhancement	Wasting	Redistribution	Fabrication	Additives/finishes	Scales of production	Production systems	CAD/CAM/RPT	Critical Analysis	Ergonomics/Anthropometrics	Inclusive design	Legislation and procedure	Copyright and patents	Six R's	Feasibility	Corporate identity/kickstarter	Visualisation and reports	Total	Paper 1 Mock examination
		Technical principles																												
		1.1 Materials and applications								1.2 Performance characteristics		1.3 Enhancement of materials	1.4 Forming and redistribution			1.5 Finishes	1.6 Modern scales of production		1.7 Digital design and manufacture	1.8 Product development			1.9 Health and safety	1.10 Protecting designs	1.11 Design for manufacturing	1.12 Feasibility studies	1.13 Enterprise	1.14 Design communication		
Lesson for delivery and assessment		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27		28
							9				8																		17	120
							2018 S1 Q17-18				2018 S1 Q1																		Total	2019
9999	[illegible]						2				4																		6	120
1001	[illegible]						3				7																		10	56
1002	[illegible]						3				4																		7	120
1003	[illegible]																												0	120
1234	[illegible]						3				8																		11	120

Number	Name	Iterative/UCD	Design history	Design movements	Key designers	Socio-economic influences	Major developments	New technologies	Social, moral, ethical	Investigation, spec etc.	Product study/evaluation	Relevan process for scale etc.	Precision/QA/QC	Environment/conservation/circular	Planning/PDM/TQM/Lean Six	Bsi/CE, FSC, legislation	Total	Paper 2 Mock examination	Total	Grade	Total questions	Average %
		Designing and making principles																				
		2.1 Design methods	2.2 Design theory			2.3 Technology and cultural change				2.4 Design processes	2.5 Critical analysis	2.6 Selecting tools/processes	2.7 Accuracy in design	2.8 Responsible design	2.9 Design for manufacture	2.10 International standards						
Lesson for delivery and assessment		29	30	31	32	33	34	35	36	37	38	39	40	41	42	43		44				
																	0	80	120		17	
																	Total	2019	Total	Grade	Total questions	Average %
9999	[illegible]																0	80	200	A*	6	35
1001	[illegible]																0	15	71	E	10	59
1002	[illegible]																0	40	160	A*	7	41
1003	[illegible]																0	40	160	A*	0	0
1234	[illegible]																0	40	160	A*	11	65

Linked to NEA

A Level | A level Exam 2019 | Assessments | Content | A Level Student Info | Grade Boundaries

Your responsibility

While your teacher will deliver material and assess your progress, you need to take responsibility for your own learning. The full set of Power Point slides will be made available to you, but they are not as detailed as the textbook which you should be using every week to support your studies.

Regular assessment will highlight where you may lack understanding or can improve. Please do not take this as criticism, it is intended to highlight weaker areas where you can make improvements and strengthen your knowledge.

Use the textbook and the past paper questions to test yourself and feel free to ask for another paper if you would like to try another question. Do go through the papers that your teacher marks and try to identify where you lost marks. Ask your teacher for advice if you are not sure.

Finally, many students think 'theory' is boring but, if you enjoy the subject and aspire to work in design or engineering, it is vital knowledge, not just for the examination, but for enriching your design skills and knowledge so make the most of it and try and enjoy the lessons!

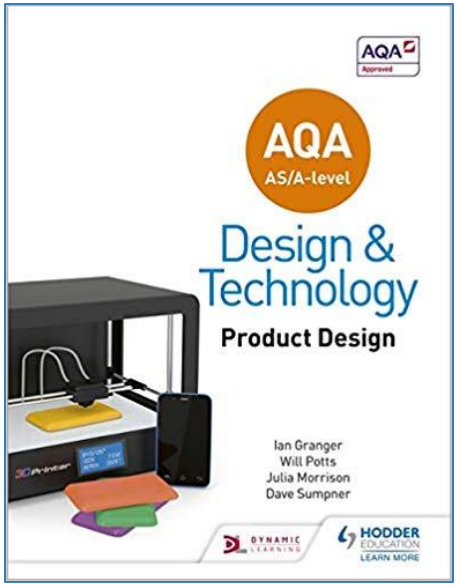
And remember, no matter how good your project is, it's just 50% of the marks!

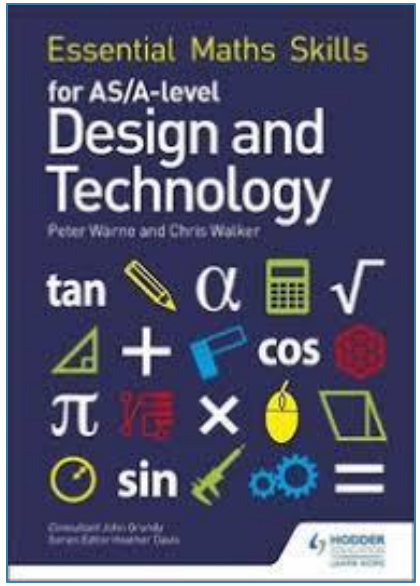
Equipment

The presentation materials used in these units will be shared with you but only at the end of a unit and after assessments have been completed.

Everyone learns in different ways and these slides are just a summary of the course content, so you are expected to take your own notes in each lesson then read the chapter in the textbook.

You should have the AQA textbook, AQA revision book and the Maths and Science book with you at each lesson. You should also have pen, pencil, rubber and a notebook or lined paper which you can put into a file. These notes should be separated with dividers so you can organize your content.





Revision

Advanced level study expects that you become an independent learner and take responsibility for your progress. To do this here are a few tips:

- Use the AQA textbook
- You should constantly refer to your textbook in order to read more on a particular topic as these slides are simply a summary of the chapters in the book with key facts and terms.
- Further reading
- Even the textbook cannot keep up to date with changes in technology and is already a few years old. You should therefore try to keep up to date with advances in design and technology via books, journals and the internet.
- Activities
- Again, the book is useful as it has subject related activities in each unit.
- Past papers
- Relevant past paper questions and the year of the exam are added after the summary of each unit.
- Marks schemes are also available if you want to test your own knowledge of a unit.

Summary of the theory content

That covers the introduction to the theoretical content, your teacher will discuss the specific requirements and expectations of the NEA.

As there is no AS level and this is a two-year course, your first few terms of practical or design-based lessons will be spent preparing you for the NEA.

Where appropriate, theory will be linked to your practical learning so you can gain a greater appreciation of the material studied by experiencing it for yourself.

To summarise:

This is a two-year course with two written examinations at the end of the course and a year long NEA element (which is often referred to as the coursework project or practical task).

Prep 1

Please ensure you have the correct equipment for the next lesson so you can start taking notes so you can revise the content and in prepare for the past paper questions you will get for prep each lesson.

Please write in your homework planner:

Get note taking equipment and resources for the next lesson.

Look through the textbook(s) in advance and bring to the next lesson (and every theory lesson). Read the introduction and look at unit 1.1.

Next lesson: Material properties and their applications