Unit Title	Mathematics for technology and engineering
FHEQ Level	4
Unit Code	DTT18104
Credit Value	15
Unit Type	Compulsory: Taught

Learning Hours

Staff – Student Contact Hours		**Independent Study Hours**	
Classes	45	Independent Study	40
Supervised access to resources	0	Preparation for Assessment	40
	(45)	Unsupervised Access to Resources	25
Total			150

Unit Description

This unit is designed to bring first year students to a common level of mathematical ability, which is nominally AS level. This unit underpins the teaching in other television technology and engineering aspects of the course. You will improve your understanding of mathematical principles and techniques relevant to technology and engineering. You will attend regular seminars on specific Maths topics, and have the option to attend timetabled revision sessions. The teaching of this unit is very much about you learning the basic principles prior to learning more contextualised Maths in years 2 and 3 of the course. Furthermore, this unit will provides you with an appreciation of the role of mathematics in the technological world.

The Five Principles underpin the Mindsets and Skillsets Manifesto and are the foundation upon which all course curriculum frameworks and unit specifications are based. The relevant Principles as stated below have been mapped against the Learning Outcomes relevant to each course unit and at each level (see Programme Specifications for full description of the Five Principles):

1. Cultivate / Where the individual thrives.
2. Collaborate / Where disciplines evolve.
3. Integrate / Where education engages industry.
4. Advocate / Where purpose meets practice.
5. Originate / creativity meets technology.

Unit Indicative Content

- Algebra (particularly logarithms and indices)
- How to draw graphs (particularly of phenomenon encountered in television)
- Trigonometry
- Functions (particularly periodic)
- Vector and scalar properties
- Numerical methods

- Simple differentiation (and where encountered in engineering)
- Complex numbers
- Introduction to matrices

Unit Aims

1. To develop hardware and software knowledge suitable for television broadcasting (course aim)

2. To bring students to a common level of mathematical ability (AS level)

3. To apply fundamental aspects of mathematics to technology and engineering

4. To be confident in selecting appropriate mathematical techniques for use in television processes and systems

Unit Learning Outcomes

LO3: **Development/Prototyping**

Demonstrate a range of tests and solutions, informed by knowledge of the principles of the engineering and mathematical process.

Based on **INTEGRATE** principle.

LO4: **(Pre) Production**

Identify, select and apply an appropriate selection of processes, techniques and methods that inform mathematical and academic practice.

Based on **COLLABORATE** principle.

Learning and Teaching Methods

- Project briefings – in order to prepare students for the aims, content, delivery, learning outcomes, and assessments
- Seminars
- Drop-in revision sessions
- VLE activities such as coursework primers
- Individual and small group work
- Autonomous study
- Continual individual and small group formative feedback
- Course work through work sheets
- Summative assessments at end of each term that demonstrates degree to which learning outcomes have been met

Assessment methods and tasks	
Brief description of assessment methods	
Assessment tasks	**Weighting (%)** *(one grade or multi-grade unit)*
Worksheets (course work). 1 per term	100%

Indicative Assessment Criteria

Assessment criteria are the basis on which the judgment of the adequacy of the work is made. A more detailed assessment criteria will be specified in the brief.

The Assessment is continual course work through worksheets. The course work will be assessed through the following specific criteria:

1. Evidence an understanding of general fundamental mathematical topics. **LO3**
2. Evidence an understanding of maths topics related to television technology and engineering. **LO3** & **LO4**
3. Demonstrate ability to analyse and present information and data through the use of graphs and tables, or other similar data presentation methods. **LO4**

Essential Reading list

1. Bolt B. (2010) Mathematics Meets Technology, Cambridge University Press
2. Erwig M. (2017) Once Upon an Algorithm: How Stories Explain Computing, MIT Press
3. Polya & Kirkpatrick (2009) The Stanford Mathematics Problem Book: With Hints and Solutions, Teachers College Press
4. Richard Courant (Author), Herbert Robbins (Author), Ian Stewart (Editor) (2nd Edition 1995) What Is Mathematics? An Elementary Approach to Ideas and Methods, Oxford University Press
5. Singh S. (2002) The Code Book: The Science of Secrecy from Ancient Egypt to Quantum Cryptography, Harper Collins

URLs

1. https://www.khanacademy.org/math
2. https://www.wolframalpha.com/examples/math/
3. http://www.bbc.co.uk/skillswise/factsheet/ma35data-e3-f-presenting-data-in-different-ways