



Unit Title	Contemporary Broadcast and Network Systems
FHEQ Level	5
Unit Code	DTT18203
Credit Value	30
Unit Type	Compulsory: Taught

Learning Hours			
Staff – Student Contact Hours		Independent Study Hours	
Classes	75	Independent Study	105
Supervised access to resources	0	Preparation for Assessment	75
	(75)	Unsupervised Access to Resources	45
Total			300

Unit Description

This unit continues your specialisation learning within the course and builds upon your project choices from year 1. You will be taught to a deeper level of understanding on topics related to the converging world of conventional broadcast hardware and computer networking systems. You will select a project that reflects your growing knowledge in a specialisation of your choice. The blended learning approach in this unit combines theoretical topics, including: television formats and network protocols (such as streaming protocols used by platforms such as Netflix), with practical project work that provides an opportunity for you to apply your understanding to real-world systems. This unit will operate alongside Broadcast Computation and Electronics to provide you with a comprehensive and correlated understanding of hardware and software in current broadcast infrastructures. This unit is a bridge to third year studies, particularly the Emerging technologies and standards unit.

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

- To review and investigate current media formats (video, audio, television, web, streaming, and files) in terms of bandwidth, dynamic range, spatio-temporal

sampling, colour space, bit-depth and other associated parameters

- To understand the array of hardware required in television infrastructure
- Role played by web standards and protocols in networked communications, including where to find them and how to interpret them
- Details of widely used protocols and stacks such as: HTTP, DNS, HTML, IP, TCP, UDP, RTMP
- Introduction to the provision of web hosting for fully scalable digital media and television solutions, and aspects of secure communications
- Practical approaches to problem solving and techniques to test, troubleshoot and debug communications solutions, using products such as Wireshark
- Creating networked media systems

Unit Aims

1. To provide a deep understanding of technology used in television broadcasting (course aim)

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

3. To understand the principles, structures, development and management of broadcast related web services

4. Understand the role and requirements of hardware and infrastructure (such as encoders, decoders, servers, routers, and clients)

5. To develop knowledge of how broadcasting utilizes networking and computer technologies (including IP)

6. To appreciate the fundamental importance of packetization, wrappers and encapsulation within broadcasting

Unit Learning Outcomes

LO2: **Concept/Ideation**

Analyse research materials leading to the generation of the ideation and concepts that inform and lead to project development.

Based on **ORIGINATE** principle.

LO4: **(Pre) Production**

Employ relevant knowledge of production skills alongside a grasp of the creative potential of a selection of processes, materials and methods that inform creative and academic practice.

Based on **COLLABORATE** principle.

LO8: **Professional Identity**

Investigate specific professional contexts to situate your own practice.

Based on **CULTIVATE** principle.

Learning and Teaching Methods

- Project briefings – in order to prepare students for the aims, content, delivery, learning outcomes, and assessments
- Seminars (including guest lecturers)
- Tutorials (individuals or small group with specialist tutor)
- Workshops (blended with seminars)
- VLE activities such as quizzes to understand knowledge of protocols
- Individual and small group work
- Autonomous study
- Continual individual and small group formative feedback
- Summative assessment at end of unit 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)
1. Individual report on broadcast hardware and infrastructure / systems. (1200 words)	50%
2. Individual or small-group proof-of-concept system design project with appropriate schematics for a broadcast computer network system. (800 words)	50%

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.

Assessment 1 is a written report of 1200 words covering the more conventional broadcast hardware and systems. The student chooses the topic. The report will be assessed through the following criteria:

1. Explanation of technology developments for digital media formats in television broadcast systems. **LO4**
2. Evidence understanding of key principles of broadcast infrastructure including acquisition, contribution, production, asset management, presentation, delivery and storage. **LO8**
3. Evidence of analysis of how to reliably and resiliently interconnect broadcast hardware within systems. **LO8**
4. Demonstrate knowledge gained with respect to developments in television standards, technologies, and drivers through investigation. **LO4**

Assessment 2 is a proof-of-concept system design project with appropriate schematics, description (800 words) including features, and purpose, for a broadcast computer

network system. The student chooses the design. The design work will be assessed through the following criteria:

5. Evidence of understanding of key principles of computer networked systems in the context of broadcast television (OTA) and OTT. **LO2**
6. Evidence of analysis of how to apply a specific computer network principle or process to broadcast infrastructure. **LO8**
7. Application of broadcast television principles to computer network technology through a proof-of-concept design for systems at Ravensbourne. **LO4**
8. Demonstrate knowledge gained with respect to developments in computer protocols, standards, and drivers through investigation. **LO4**

Essential Reading list

1. Bean K. and Lake S., 2012, *Media: Concepts and Applications*, South Western. ISBN: 978-0-538-74130-9
2. Kaufman C., Pearlman R., Speciner M., 2007, *Network Security: Private Communication in a Public World*, Prentice Hall, ISBN: 978-0-13046-019-6
3. Rajaraman V., 2013, *Introduction to Information Technology*, 2nd Edn., PHI Learning ISBN: 978-81-203-4731-1
4. Shklar, L., 2011, *Studyguide for Web Application Architecture: Principles, Protocols and Practices*. Academic Internet. ISBN: 978-0-470-51860-1
5. Simpson, W., 2008, *IPTV, Internet Video, H.264, P2P, Web TV, and Streaming: A Complete Guide to Understanding the Technology*, 2nd Edition, Focal Press.
6. Tozer E. P. J., 2012. *Broadcast Engineer's Reference Book*, CRC Press.

URLs

1. http://www.img.lx.it.pt/~fp/cav/Additional_material/MPEG2_overview.pdf Guide to MPEG Fundamentals and Protocol Analysis
2. http://www.img.lx.it.pt/~fp/cav/Additional_material/HEVC-Performance.pdf Comparison of the Coding Efficiency of VideoCoding Standards
3. <https://ritdml.rit.edu/bitstream/handle/1850/412/EMajewiczIndependentStudy.pdf;jsessionid=06F88E77C619E6E8DF95E1578BB6BF7C?sequence=1> Analysis of Digital Audio Compression and Digital Rights Management
4. <https://www.thebroadcastbridge.com/content/entry/8680/documentation-part-2-designing-and-documenting-an-ip-architecture> System Design
5. https://tech.ebu.ch/docs/techreview/trev_301-middleware.pdf System Integration