



Department of Electronic and Electrical Engineering
The University of Sheffield

EEE6211 AVIONICS TECHNOLOGIES

Credits: 15

Course description including aims

1. To introduce avionic systems and highlight their role and importance in modern aircraft.
2. To discuss system reliability, failure detection, redundancy and failure survival configurations.
3. To introduce Fly-By-Wire flight control and discuss the trends towards Power-By-Wire in the more-electric aircraft.
4. To introduce navigation systems.
5. To introduce gas turbine principle of operation and state-of-art controls.
6. To introduce aircraft certification.

Outline syllabus

Avionic systems: systems interfacing directly with the pilot, aircraft state sensor systems, navigation systems, external world sensor systems, task automation systems. **Reliability:** Failure detection, redundancy and failure survival configurations; **Flight control systems:** Fly-by-wire flight control system, Power-by-wire concepts, the more-electric aircraft. **Air navigation:** flight planning, electronic navigation aids. **Gas turbine:** principle of operation, Full Authority Digital Engine Control (FADEC); **Aircraft certification;**

Time allocation

36 lectures.

Recommended previous courses

Entry qualifications.

Assessment

3-hour examination, answer 4 questions from 6.

Recommended books

Collinson R. P. G.	<i>INTRODUCTION TO AVIONICS</i>	(Chapman & Hall)
Pallett E. H. J.	<i>AIRCRAFT ELECTRICAL SYSTEMS</i>	(Longman)
Floyd T. L.	<i>DIGITAL FUNDAMENTALS</i>	(Prentice Hall)
Keiser B.	<i>PRINCIPLES OF ELECTROMAGNETIC COMPATIBILITY</i>	(Artech House)

Objectives

1. To understand the role and importance of avionic systems in modern aircraft and to be aware of the avionic environment.
2. To appreciate the importance of reliability in airborne systems and understand the methods employed for estimation of system reliability and the concepts of redundancy and failure survival.
3. To understand the role of flight control systems, such as fly-by-wire and be aware of the trends towards the more-electric aircraft.
4. To understand state of the art navigation systems.
5. To understand the principle of operation of gas turbines and their control.
6. To be aware of the steps and requirements of aircraft certification.