ETC International College

Programme Specification: International Year 1 & 2 Aeronautical Engineering

January 2020

1. Course Details

Teaching Institution: ETC International College
Bournemouth, Dorset, UK

Award Titles & Qualification Codes:

International Year 1 Aeronautical Engineering

International Year 2 Aeronautical Engineering

2. Course Aims & Learning Outcomes

Course Aims:

The programme is intended to;

- Equip individuals with the knowledge, understanding and skills to be successful in employment in the Aeronautical Engineering or related sectors.
- Enable progression to complete an undergraduate degree or further professional qualification in Aeronautical Engineering.
- Provide opportunities for specialist study relevant to individual vocations.
- Develop the individual's ability to make an immediate contribution to employment in the Aeronautical Engineering sector.
- Develop a range of skills and techniques, personal qualities and attributes essential for successful performance in working life.
- Provide opportunities for learners to gain a nationally-recognised vocationally-specific qualification.
- Provide the opportunity for international students to develop general & technical English language skills related to their chosen career.

Professional Benchmarks & Learning Outcomes:

In addition to the specific Learning Outcomes for each unit of study (see Appendix 1), the programme provides opportunities for students to develop and demonstrate the following:

Basic Knowledge & Understanding;

- Knowledge of a range of aviation engineering tools, techniques and processes.
- Analytical methods relevant to Aeronautical Engineering, including the application of computers for quantitative analysis, simulation, problem-solving and the manipulation and presentation of engineering information.
- Current regulatory, industry standard & best practices in aviation.
- Scientific principles and application of theory, such as energy transfer systems, mechanical loading, material selection and failure.
- General principles and techniques of design and the characteristics of aerospace engineering materials and components.

Higher level academic/ intellectual skills including ability to:

- Plan, conduct and report a programme of research.
- Plan and execute safely a series of experiments.
- Use laboratory equipment and software packages to generate, analyse data and solve engineering problems, including the use of commercial software packages.
- Design a system, component or process to meet a need, and evaluate designs to make improvements.

- Be creative in the solution of problems and in the development of designs.
- Integrate and evaluate information and data from a variety of sources.

Higher practical and professional skills including the ability to:

- Design a system, component or process to meet a need.
- Manage aviation engineering and business practices, including project management.
- Integrate and evaluate information and data from a variety of sources.
- Effective problem solving and decision making using appropriate quantitative and qualitative skills including identifying, formulating and solving problems.
- The ability to use ICT and Management Information Systems in an Aeronautical Engineering setting.

Higher Level transferable skills development including:

- Effective use of communication and information technology for aerospace related areas.
- Effective self-management in terms of time, planning, resilience, self-starting and individual initiative.
- Effective performance within a team environment including leadership, team building, influencing and project management skills.
- Interpersonal skills, e.g. effective listening, negotiating, persuading and presentation.
- Numeric and quantitative skills including data analysis, interpretation and extrapolation.
- Read and use appropriate literature with a full and critical understanding.
- Think independently and take responsibility for their own learning whilst recognising their preferred learning style(s).

3. Course Structure, Delivery and Assessment

Course Description & Duration:

Year 1 Certificate:

- 8 modules + English modules (as necessary), spread over 36 teaching weeks (3 terms of 12 weeks)
- Total of 120 credits

Year 2 Diploma:

- 8 modules + English modules (as necessary), spread over 36 teaching weeks (3 terms of 12 weeks)
- Total of 120 credits
- Optional additional 15 credit unit

Entry Requirements:

- **Qualifications:** Foundation course (level 3) or equivalent (A-levels / High School Diploma); must include Maths & Science to level 3
- **English:** IELTS 6 overall (minimum of 5.5 in any component), CEFR B2 or equivalent
- **Minimum Age:** 18 years

Weekly Hours: Between 15 and 20 Guided Learning (contact) hours, dependant on individual requirements for additional English lessons.

Number of Lessons: Between 18 and 25 lessons per week (nominally 50 minutes per lesson)

Entry Points: There is one entry point each year, in September. Students may be individually assessed for entry at other times of the year, depending on prior education, but the overall requirements for credits and guided learning hours must be preserved to achieve the overall award.

Minimum No. of students per class: Nominally 4.

Sample Timetable:

Aero Engineering Year 1 – Sample Timetable					
Session	**Mon**	**Tue**	**Wed**	**Thu**	**Fri**
	06/01/2020	**07/01/2020**	**08/01/2020**	**09/01/2020**	**10/01/2020**
09:00 – 9:50	**Engineering Design (CAD)**	**Engineering Design**	**Engineering Design**	**Engineering Maths**	
Break	Break	Break	Break	Break	Break
10:00 – 10:50	**Aircraft Aerodynamics**	**Aircraft Aerodynamics**	**Aircraft Aerodynamics**	**Aircraft Aerodynamics**	
Break	Break	Break	Break	Break	Break
11:00 – 11:50	**Engineering Maths**	**Engineering Maths**	**Engineering Maths**	**Engineering Maths**	
Lunch	Lunch	Lunch	Lunch	Lunch	Lunch
13:00 – 13:50	**Managing a Professional Engineering Project**	**Managing a Professional Engineering Project**	**Managing a Professional Engineering Project**	**Managing a Professional Engineering Project**	
Break	Break	Break	Break	Break	Break
14:00 – 14:50	**Aircraft Mechanical Systems**	**Aircraft Mechanical Systems**	**Aircraft Mechanical Systems**	**Aircraft Mechanical Systems**	
Break	Break	Break	Break	Break	Break
15:00 – 15:50	**English (as required)**	**English (as required)**	**English (as required)**	**English (as required)**	

Unit Hours: Each unit of study will consist of 60 guided learning hours. In addition, 90 hours recommended personal study time and all necessary invigilated assessments will be expected to take place outside of normal lessons.

Some subjects will be completed in 12 weeks (one term), while others may be completed in 24 weeks (two terms). Therefore the weekly number of lessons per subject may vary, and different subjects may be studied at different times of the academic year.

Units of Work: Each award comprises the following taught units:

Year 1 Certificate – 120 credits at level 4

Unit Title	Credits	Unit Type
1 Engineering Design	15	**Mandatory**
2 Engineering Maths	15	**Mandatory**
3 Engineering Science	15	**Mandatory**
4 Managing a Professional Engineering Project	15	**Mandatory**
24 Aircraft Aerodynamics	15	**Mandatory**
25 Aircraft Electrical Power and Distribution Systems	15	
26 Aircraft Mechanical Systems	15	
79 Computer Aided Design (CAD) for Engineering	15	
Total	**120**	

Year 2 Diploma – 240 credits (120 credits at level 5 + 120 credits at level 4)

Unit Title	Credits	Unit Type
34 Research Project	30	**Mandatory**
35 Professional Engineering Management	15	**Mandatory**
39 Further Mathematics	15	**Mandatory**
55 Aircraft Flight Control Systems	15	**Mandatory**
56 Aircraft Propulsion Principles and Technology	15	
57 Aircraft Structural Integrity	15	
59 Aircraft Gas Turbine Engine Design and Performance	15	
99 Rocket Science	15	**Optional**
Total	**120**	

Methodology: Learners will experience a wide range of teaching methodologies covering lectures, presentations, seminars, classroom discussions, field trips, team work, projects, quizzes, case studies, audio-visual materials.

Assessment: These may take the form of individual and team based projects and presentations / seminars, tests, personal learning journals, exams, continuous assessment, portfolios, mind maps, organising events, all based on the college fair assessment policy (see appendix 2).

All final unit grades will be agreed at formal Assessment and Award Boards held at regular intervals throughout the year at the College.

Resubmissions: If a student is unable to pass an assessment the first time, (s)he will be given constructive feedback on how to improve and offered a viva / resit or resubmission of work, according to the college Fair Assessment policy.

Certificates and Transcripts: Certificates will only be issued to students who have attended 80% or more of lessons or of each module, and achieved all relevant assessment tasks. Transcripts will record only the grades of modules that a student has successfully passed.

English Result: English levels are only recorded on certificates and transcripts if students have passed the ETC proficiency English tests or have been awarded an IELTS certificate within the duration of the course.

Awarding Body: ETC International College.

Independent Work: Students are encouraged to complete project work, revision, research, flipped learning and consolidation tasks, and to develop robust study skills.

Tutorials: Tutorials are completed periodically to monitor & support students in all areas of their studies. This includes attendance, progress and engagement.

4. Delivery Staff

Chris Parker Head of HE/FE	**Nadia Ghwedar** Admin Support Officer
Praneeta Phadke Senior Engineering lecturer	**Sumana Subramanyam** Senior Engineering lecturer
Sai Priya Dandothkar Engineering lecturer	**Amedeo Angiolini** Specialist Engineering Lecturer
Guru Veerasingam Aeronautical lecturer	

All staff can be contacted via the College reception or the FEHE Office (room 51 in Durley Road building), or through the course / FEHE email accounts.

Other specialist teachers, industry representatives or visitors may be used to teach learning outcomes or topics, as required.

5. APPENDIX 1: Unit Specifications

Details of learning outcomes and assessment criteria for each unit are given in the individual unit induction booklets, which are available on the college VLE (Virtual Learning Environment).

Year 1 Certificate Units

Unit 1 Engineering Design

This unit shows students how to prepare an engineering design specification that satisfies stakeholder's requirements, implement best practice when analysing and evaluating possible design solutions, and prepare a written technical design report and present finalised design to a customer or audience.

Unit 2 Engineering Maths

This unit aims to employ mathematical methods within a variety of contextualised examples, interpret data using statistical techniques, and use analytical and computational methods to evaluate and solve engineering problems.

Unit 3 Engineering Science

This unit aims to interpret and present qualitative and quantitative data using computer software, calculate unknown parameters within mechanical systems, explain a variety of material properties and use electromagnetic theory in an applied context.

Unit 4 Managing a Professional Engineering Project

This unit aims to conceive, plan, develop and execute a successful engineering project, and produce and present a project report outlining and reflecting on the outcomes of each of the project processes and stages using critical thinking, analysis, reasoning, interpretation, decision-making, information literacy, and information and communication technology, and skills in professional and confident self-presentation.

Unit 24 Aircraft Aerodynamics

This unit introduces students to the atmosphere in which aircraft fly and the scientific principles that underpin flight theory; the aerodynamic forces that are generated throughout all phases of flight and the effect they have on the aircraft airframe; how a study of the nature of high speed air flows lead to

the necessary design features for aircraft that fly at supersonic velocities and how aircraft are stabilised and controlled during flight.

Topics included in this unit are: the atmosphere, aerodynamic principles, flight forces and their effect, high speed airflows, design features of high speed aircraft, stability and control.

Unit 25 Aircraft Electrical Power and Distribution System

Primary sources of aircraft electrical power include batteries, DC and AC generators, and transformer rectifier units (TRU). In addition to these internal sources of power, aircraft also have the ability to be connected to external ground power units (GPU). For large transport aircraft, the use of ground power is essential during maintenance and whilst an aircraft is being loaded or fuelled. Larger aircraft may also have the benefit of an auxiliary power unit (APU), which can be used for starting the aircraft's main engines as well as providing power for essential systems.

This unit will provide the student with a comprehensive introduction to the generation and distribution of electrical power in an aircraft. Different methods of generating, supplying, distributing and managing the electrical power required by typical modern aircraft will also be investigated, together with the purpose and operation of related components and sub-systems such as contactors, regulators, protection circuits and bus power control units (BPCU).

Unit 26 Aircraft Mechanical Systems

This unit introduces students to the design and operation of airframe mechanical systems (hydraulic power, landing gear, flight control systems, environmental control systems, protection systems and airframe fuel systems) and how these systems contribute to the safety of personnel, the aircraft airframe and its engines.

On successful completion of this unit, students will be able to examine how the design and operation of hydraulic systems and services and environmental control systems contribute towards safe aircraft flight and passenger and crew comfort and safety. They will also be able to determine how the layout and operation of protection and airframe fuel systems contribute to the safety of the aircraft, personnel and engine operation.

Unit 79 Computer Aided Design (CAD) for Engineering

Computer Aided Design (CAD) is the use of computer technology in engineering industries, enabling the exploration of design ideas, the visualising of concepts and to simulate how a design will look and perform in the real world prior to production. The ability to analyse, modify and optimise a Computer Generated Image (CGI), object and/or 3D environment is an integral part of the design process in all areas of engineering.

This unit aims to provide students with opportunities to develop their understanding and knowledge of CAD software applications used in engineering, and the practical skills to utilise the technology within their own creative work.

On successful completion of this unit students will be able to understand the current and prospective uses of CAD technology within engineering, and be able to produce CAD drawing, objects, 3D environments and visualisations.

Year 2 Diploma Units

Unit 34 Research Project

This unit introduces students to deliver a complex and independent research project in line with the original objectives, explain the critical thinking skills associated with solving engineering problems, consider multiple perspectives in reaching a balanced and justifiable conclusion, and communicate effectively a research project's outcome.

Unit 35 Professional Engineering Management

This unit aims to construct a coherent engineering services delivery plan to meet the requirements of a sector-specific organisation or business by displaying personal commitment to professional standards and obligations to society, the engineering profession and the environment.

Unit 39 Further Mathematics

This unit aims to use applications of number theory in practical engineering situations, solve systems of linear equations relevant to engineering applications using matrix methods, approximate solutions of contextualised examples with graphical and numerical methods, and review models of engineering systems using ordinary differential equations.

Unit 55 Aircraft Flight Control Systems

This unit will cover the design, development and operation of flight control systems for fixed wing aircraft through the generations and introduces students to the design, development and operation of mechanical, hydraulic power and fly-by-wire systems, and automatic flight control in the form of autopilot and autoland systems.

On successful completion of this unit students will be able to determine the construction, layout and operation of mechanical flight control systems and control surfaces, examine the design and operation of fly-by-wire flight control systems, determine the functions and operation of autopilot and autoland flight control systems and determine the contribution made to safe flight control by each system.

Unit 56 Aircraft Propulsion Principles and Technology

This unit introduces students to the thermodynamic and mechanical principles that underpin aircraft propulsion and to gas turbine engine and piston engine construction, function and operation, as well as to the layout and operation of their associated components and support systems.

On successful completion of this unit students will be able to determine how thermodynamic and mechanical properties are applied to aircraft propulsion, and examine the construction, function and operation of gas turbine engines, their fluid, control and monitoring systems and piston engines and systems.

Unit 57 Aircraft Structural Integrity

This unit introduces students to the properties and selection of materials used for the construction and repair of the airframe, the prediction of structural damage and design against failure, the methods and design of adhesively bonded repairs, as well as to the policies, procedures and regulation used to ensure the integrity of aircraft structures during service.

On successful completion of this unit students will be able to examine the design criteria, properties and selection of aircraft metallic and composite structural materials, examine aircraft structural fatigue, damage prediction and design against failure, examine fibre composite adhesively bonded repairs to aircraft metallic and composite structures, and investigate how policies, procedures and regulations are used to ensure the integrity of aircraft structures.

Unit 59 Aircraft Gas Turbine Engine Design and Performance

This unit introduces students to the thermo-fluid principles and propulsion cycles used to assess the overall efficiencies of gas turbine engines, and to the design and performance of the turbomachinery, intake, combustion and exhaust modules that provide the propulsive thrust, as well as to the relationship between their design, performance and effect on the environment.

On successful completion of this unit students will be able to determine gas turbine engine performance using thermo-fluid principles and propulsion cycle efficiencies; examine the design and performance of aircraft gas turbine engine turbomachinery, intake, combustion and exhaust modules; and investigate the factors affecting the design, performance and environmental impact of gas turbine powered aircraft operation.

Unit 99 Rocket Science

This unit covers the main principles affecting rocket flight, in particular some of the physical forces and restrictions. Students will learn how these factors affect design and operating characteristics of rocket powered vehicles, as well as materials used and why. They will learn about construction and testing processes, as well as health and safety concerns. Practical and theoretical understanding will be consolidated in a study of the existing equipment and applications for this kind of technology.

English for Academic Purposes

This module prepares students for the academic part of the programme, through research methods, understanding lectures note-taking, summarising, adding own ideas, structuring essays, preparing and giving seminars and presentations.

Reading

- Preparing for lectures
- Reading and understanding handouts / books / internet quotes / newspapers
- Identifying main points of text paragraphs
- Gist / Skimming for themes / Scanning for detail
- Developing opinions on the text
- Using text information for referencing/building a bibliography

Listening

- Note taking
- Identifying key points in lectures/seminars/videos/TV/Radio
- Following lines of discussion
- Listening for detail
- Following Cause/Effect arguments
- Understanding how examples support theories
- Identifying different opinions
- Adding own opinions
- Using auditory source information for referencing/building a bibliography

Speaking

- Working in teams:
- Prioritising
- People Management
- Resource Management
- Time Management
- Stress Management
- Crisis Management
- Discussion Skills
- Seminars and Presentations
- Group
- Individual
- Preparing
- Practising
- Presenting
- Evaluating
- Participating
- Structuring talks
- Formatting Slides

- Speaking from notes
- Developing an original style

Writing

- Structuring assignments
- Establishing a thesis statement
- Writing a methodology
- Writing a literature review
- Designing questionnaires
- Presenting graphs and tables
- Conducting primary/secondary research
- Analysing and interpreting data
- Triangulating data
- Upgrading vocabulary
- Efficient task achievement
- Developing cohesive arguments
- Referencing and Bibliography skills
- Using examples to support ideas
- Adding own opinion
- Introductions and conclusions
- Using cause / effect arguments
- Research skills
- Process writing – drafting and redrafting
- Reviewing original thesis

Vocabulary

- Predictive skills
- Decoding text - auditory and written
- Recycling new vocabulary
- Identifying register / range / genre
- Encoding text – spoken and written
- Word / sentence transformations

Language

- Grammar rules / forms / patterns
- Collocations
- Phonemes
- Fluency
- Stress / rhythm / intonation
- Phatic language
- Embedded words
- Ellipsis / elision / contractions / accents

6. APPENDIX 2: ETC Fair Assessment Policy (summary)

The ETC Fair Assessment Policy is designed to ensure that all candidates have equal and fair access to assessment procedures. It enables the delivery of internally verified assessments according to the learning outcomes at the level of your chosen course.

The full & updated version of this policy can be found on the ETC website. Below is a summary of the main points;

Assessments follow strict industry guidelines and do not allow discriminatory practices on the basis of race, gender, age, disability or other unique factors affecting candidates.

All assessments are written by qualified educational practitioners and are verified according to the fair assessment policy guidelines.

The fair assessment policy also operates according to the guiding principle of a variety of academic awarding bodies that continually monitor the quality of the college's systems and procedures.

The policy explains what you can do if you wish to dispute or appeal a result, as well as advising teachers on how to get students to the next step if they are unable to achieve at any stage of the assessment process.

Assessments

Assessments can take the form of formative or summative assessment whereby the former would consist of continuous assessment, homework, assignments, presentations, personal learning journals, essays, progress tests, reports, mind maps, projects, role plays etc. and the latter of exams or Spoken Question and Answer Sessions or end of term presentation.

You are normally given a minimum of 4 weeks to prepare the assessment depending on the length of the course with an opportunity for meeting the tutor prior to submission to discuss the first draft of the assessment or presentation. At this point, the tutor may give general guidance on how to improve the assessment / presentation but may not comment on specific details or actual answers to learning outcomes addressed by the assessment.

You then have a further 14 days to follow through the advice of the tutor and complete your assignments before handing them in to reception or other designated office and sending them electronically to the e-mail addresses on the front of the assessment.

Assessors are normally then given 7 working days to mark the assignments. You are immediately informed of the results by the tutor and told that the result is subject to internal and external verification, which may increase or decrease the value of the result.

The roles and responsibilities and expectations for students regarding assessments are detailed in the policy.

All students' work is expected to be their own, correctly referenced and free from any plagiarism or other infringement of college rules. Any suspicion of malpractice will be dealt with in line with college procedures and BTEC guidelines.

Assessment Boards

ETC holds assessment boards a minimum of each term for all BTEC Higher National programmes. The main purpose of ETC's Assessment Board is to make recommendations on:

- The grades achieved by students on the individual units
- Extenuating circumstances
- Cases of cheating and plagiarism
- Progression of students on to the next stage of the programme
- The awards to be made to students
- Referrals and deferrals.

ETC's Assessment Board may also monitor academic standards. The main boards are normally held at the end of each term

7. APPENDIX 3: Appeals Process

Students may appeal assessment decisions as outlined in the ETC Fair Assessment Policy. Students also have the right to appeal to Pearson and the Office of the Independent Adjudicator. The situations and methods of these processes are detailed on the Pearson website.

In addition, ETC has a Complaints Procedure, detailed in student induction and on the ETC website. Members of ETC staff will be able to direct students to the correct source of information.

1. The ETC Complaints Procedure covers the following steps;
2. Reporting
3. Investigation / processing
4. Action / resolution
5. Appeal
6. External – other actions that clients may wish to take

8. APPENDIX 4: Progression

Academic Counselling / Choice of University and Degree Course

ETC has formed links with several British and international colleges and universities.

Our team of academic counsellors will be delighted to help students to choose the course and institution most suited to them and assist them in their application to these organizations.

Students' choice of university and degree course will be determined by their own academic record and by the different specializations offered by each university. (Certain universities are famous for particular subjects, and some courses are only offered by a small number of universities).

Former ETC students have entered a great number of colleges and universities, in the UK and overseas, including the following:

Cambridge University London School of Economics UCL (London) Warwick University University of Derby. Nottingham University Oxford Brookes University. University of Manchester University of Birmingham Birmingham City University University of Brighton	University of Buckingham Cardiff University Bournemouth University Bournemouth and Poole College The Arts University College, Bournemouth University of Waikato, New Zealand Middlesex University Winchester University University of Chichester University of Plymouth

9. APPENDIX 5: Vocational Key Texts & Resources

Units have core texts and recommended reading, as well as other materials available in ETC library, the VLE or online generally. Academic staff will detail these resources in unit inductions. Through the process of completing units, tutorials and in general discussion, staff will be available to recommend further material, according to an individual student's needs.

The following is a summary of key texts & resources.

Year 1 Certificate

Unit 1 - Engineering Design

Textbooks

DUL, J. and WEERDMEESTER, B. (2008) Ergonomics for beginners. 3rd Ed. Boca Raton: CRC Press.

DYM, C.L., LITTLE, P. and ORWIN, E. (2014) Engineering Design: a Project Based Introduction. 4th Ed.

Wiley.

GRIFFITHS, B. (2003) Engineering Drawing for Manufacture. Kogan Page Science.

REDDY, K.V. (2008) Textbook of Engineering Drawing. 2nd Ed. Hyderabad: BS Publications.

Websites

www.epsrc.ac.uk Engineering and Physical Sciences Research Council (General Reference)

www.imeche.org Institution of Mechanical Engineers (General Reference)

Unit 2 - Engineering Maths

Textbooks

SINGH, K. (2011) Engineering Mathematics Through Applications. 2nd Ed.

Basingstoke: Palgrave Macmillan.

STROUD, K.A. and BOOTH, D.J. (2013) Engineering Mathematics. 7th Ed.

Basingstoke: Palgrave Macmillan.

Websites

https://www.khanacademy.org/ Khan Academy Physics (Tutorials)

Unit 3 - Engineering Science

Textbooks

BIRD, J. (2012) Science for Engineering. 4th Ed. London: Routledge.

BOLTON, W. (2006) Engineering Science. 5th Ed. London: Routledge.

TOOLEY, M. and DINGLE, L. (2012) *Engineering Science: For Foundation Degree and Higher National*. London: Routledge.

Journals

International Journal of Engineering Science.

International Journal of Engineering Science and Innovative Technology.

Websites

https://www.khanacademy.org/ Khan Academy Physics (Tutorials)

Unit 4 - Managing a Professional Engineering Project

Textbooks

PUGH, P. S. (1990) Total Design: Integrated Methods for Successful Product Engineering. Prentice Hall.

STRIEBIG, B., OGUNDIPE, A. and PAPADAKIS, M. (2015) Engineering Applications in Sustainable Design and Development. Cengage Learning.

ULRICH, K. and EPPINGER, S. (2011) Product Design and Development. 5th Ed. McGraw-Hill Higher Education.

Journals

Journal of Engineering Design.

Unit 24 - Aircraft Dynamics

Textbooks

ANDERSON Jr, J. D. (2016) Introduction to Flight. 8th International Student Ed. McGraw-Hill.

BARNARD, R. H. and PHILPOTT, D. R. (2010) Aircraft Flight. 4th Ed. Pearson.

DINGLE, L. and TOOLEY, M. (2013) Aircraft Engineering Principles. 2nd Ed. Routledge.

Journals

Aerospace (the magazine of the Royal Aeronautical Society), with articles on all areas of aerospace including innovation and design for flight.

The Aeronautical Journal. Cambridge University Press. Covering all aspects of aerospace engineering and research.

Websites

http://www.av8n.com/ AV8N See How It Flies (E-Book)

Unit 25 - Aircraft Electrical Power and Distribution System

Textbooks

EISMIN, T. (2013) Aircraft Electricity and Electronics. 6th Ed. McGraw-Hill Education. TOOLEY, M. and DINGLE, L. (2013) Aircraft Engineering Principles. Taylor & Francis Aerospace and Aviation Engineering.

TOOLEY, M. and WYATT, D. (2009) Aircraft Electrical and Electronic Systems. Butterworth-Heinemann.

Websites

https://www.faa.gov/ Aircraft Electrical Systems (FAA) AMT Airframe Handbook: Ch 9 Air Craft electrical Systems (E-Book)

http://www.mathworks.com MathWorks Aircraft Electrical Power Generation and Distribution (Simulation) (Development Tool)

http://www.maritime.org San Francisco Maritime National Park Association Aviation Electricity and Electronics—Power Generation and Distribution (E-Book) http://cdn.intechopen.com/ INTECH Power Generation and Distribution System for a More Electric Aircraft (MEA) – A Review (E-Book)

https://core.ac.uk CORE Dynamic Power Distribution Management for All Electric Aircraft (E-Book)

Unit 26 - Aircraft Mechanical Systems

Textbooks

MOIR, I. and SEABRIDGE, A. (2008) Aircraft Systems: Mechanical, Electrical and Avionics Subsystems Integration (Aerospace Series). 3rd Ed. Chichester: Wiley.

PARR, A. (2011) Hydraulics and Pneumatics: A technician and engineers guide. 3rd Ed. Imprint Butterworth Heinemann Ltd.

Journals

Aerospace (the magazine of the Royal Aeronautical Society), with articles on all areas of aerospace including airframe systems design and innovation.

Websites

https://www.faa.gov Federal Aviation Administration AMT Airframe Handbook (E-Book)

https://ocw.mit.edu MIT Open Courseware hydro-mechanical aircraft systems design and flight control systems engineering (Tutorials)

Unit 79 - Computer Aided Design (CAD for Engineering)

Textbooks

LIPSON, H. and KURMAN, M. (2013) Fabricated: The new world of 3D printing. John Wiley.

A range of online resources will be utilised, specific to proprietary CAD software used. Students will be encouraged to research, select and make use of resources that match their individual learning styles and level of understanding in this subject.

Year 2 Diploma

Unit 34 - Research Project

Textbooks

LEONG, E. C., LEE-HSIA, C. H. and WEE ONG, K. K. (2015) Guide to Research Projects for Engineering Students – Planning, Writing and Presenting. Apple Academic Press Inc.

OBERLENDER, G. D. (2014) Project Management for Engineering and Construction. 3rd Ed. McGraw-Hill Education.

Website

https://www.apm.org.uk/ Association for Project Management (General Reference)

Unit 35 - Professional Engineering Management

Textbooks

BURNS, B. (2014) Managing Change. 6th Ed. Pearson.

DEARDEN, H. (2013) Professional Engineering Practice: Reflections on the Role of the Professional Engineer. CreateSpace Independent Publishing Platform.

KARTEN, N. (2010) Presentation Skills for Technical Professionals. IT Governance Ltd.

LOCK, D. (2013) Project Management. 10th Ed. Routledge.

Websites

http://www.engc.org.uk/ Engineering Council UK-SPEC UK Standard for Professional Engineering Competence (E-Books)

http://www.ewb-uk.org/ Engineering without Borders (General Reference)

Unit 39 - Further Mathematics

Textbooks

BIRD, J. (2014) Higher Engineering Mathematics. 7th Ed. London: Routledge.

SINGH, K. (2011) Engineering Mathematics Trough Applications. Basingstoke: Palgrave Macmillan.

STROUD, K. A. and BOOTH, D. J. (2013) Engineering Mathematics. 7th Ed. Basingstoke: Palgrave Macmillan.

Journals

Communications on Pure and Applied Mathematics. Wiley.

Journal of Engineering Mathematics. Springer.

Journal of Mathematical Physics. American Institute of Physics.

Websites

http://www.mathcentre.ac.uk/ Maths Centre (Tutorials)

http://www.mathtutor.ac.uk/ Maths Tutor (Tutorials)

Unit 55 - Aircraft Flight Control Systems

Textbooks

MOIR, I. and SEABRIDGE, A. (2008) Aircraft Systems: Mechanical, Electrical and Avionics Subsystems Integration (Aerospace Series). 3rd Ed. Chichester: Wiley.

WYATT, D. (2015) Aircraft Flight Instruments and Guidance Systems. 1st Ed. Routledge.

Journals

Aerospace (the magazine of the Royal Aeronautical Society), with articles on all areas of aerospace including the latest innovations on the design of fly-by-wire and fly-by-light flight control systems.

Websites

https://www.faa.gov Federal Aviation Administration Advanced Avionics Handbook (E-Book)

Unit 56 - Aircraft Propulsion Principles and Technology

Textbooks

Royce, R. (2015) The Jet Engine. 5th edn. Chichester, West Sussex: John Wiley & Sons. SARAVANAMUTTOO, H. I. H., ROGERS, G. F. C., COHEN, H., STRAZNICKY, P. V. (2009) Gas Turbine Theory. 6th Ed. Pearson.

TOOLEY, M., and DINGLE, L. (2012) Engineering Science, Part III. Routledge.

Journals

The Aeronautical Journal. Cambridge University Press. Covering all aspects of aerospace.

Unit 57 - Aircraft Structural Integrity

Textbooks

ASHBY, M. F. (2010) Materials Selection in Mechanical Design. 4th Ed. Elsevier.

BAKER, A., DUTTON, S., KELLY, D., (2004) Composite Materials for Aircraft Structures. 2nd Ed. American Institute of Aeronautics and Astronautics (AIAA).

JANSSEN, M., ZUIDEMA, J., WANHILL, R., (2009) Fracture Mechanics. Spoon Press, imprint of Taylor & Francis.

MOURITZ, P. A. (2012) Introduction to Aerospace Materials. Woodhead Publishing.

Journals

The following professional journals of the Institute of Mechanical Engineers published by Sage provide useful high level information on aircraft materials and structures that could be made available for library reference:

Mechanical Engineers Part G Journal of Aerospace Engineering.

Mechanical Engineers Part L Journal of Materials Design and Applications.

Websites

https://www.faa.gov/ Federal Aviation Administration Aviation Maintenance Technician Handbook (E-Book)

Unit 59 - Aircraft Gas Turbine Engine Design and Performance

Textbooks

CUMPSTY, N. and HEYES, A. (2016) Jet Propulsion. 3rd Ed. Cambridge University Press. A simple guide to the aerodynamic and thermodynamic design and performance of jet engines.

Royce, R. (2015) The Jet Engine. 5th edn. Chichester, West Sussex: John Wiley & Sons. SARAVANAMUTTOO, H. I. H., ROGERS, G. F. C., COHEN, H. and STRAZNICKY, P. V. (2009) Gas Turbine Theory. 6th Ed. Pearson.

TOOLEY, M. and DINGLE, L. (2012) Engineering Science, Part III. Routledge.

Journals

The Aeronautical Journal. Cambridge University Press. Covering all aspects of aerospace.