

COURSE OUTLINE

(VERSION 2.00)

ELEC 4504: AVIONICS SYSTEMS - WINTER 2022

DEPARTMENT OF ELECTRONICS

CARLETON UNIVERSITY

1 INSTRUCTOR INFORMATION AND OFFICE HOURS

Tashfeen Karamat:

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Office: ME4248

Office Hours: By appointment (arranged via email)

TA Information: NA

2 LEARNING OBJECTIVES

The objective of this course is to provide an overview of Avionic systems technologies that enable aircraft to integrate and operate within the Domestic Airspace system and detail the method in which avionics systems are architected and designed as a part of complex aircraft systems.

3 PREREQUISITE(S)

Fourth-year status in Engineering. Not open to students in Electrical Engineering, Computer Systems Engineering, Engineering Physics or Communications Engineering.

Precludes additional credit for AERO 4504 (no longer offered).

4 COURSE TOPICS

This course will introduce students to various avionics subjects such as:

- Electromagnetic Spectrum and Wave Propagation
- Antenna Theory and Applications
- Communications Systems
- Navigation and Identification Systems
- Global Positioning System and Augmentation
- Inertial Navigation System and Navigation System Integration
- Pulsed Radar and Continuous Wave Radar
- Electronic Warfare
- Aircraft Power Systems
- Data Bus Networks

5 COURSE MATERIAL

5.1 TEXTBOOK

- Moir I, Seabridge A, Jukes M. Civil avionics systems 2nd Ed, AIAA, 2013.

5.2 REFERENCE BOOKS

- David Adamy, "EW101 - A First Course in Electronic Warfare", Artech House, 2002
- A. Noureldin, T, Karamat et al, "Fundamentals of Inertial Navigation, Satellite-based Positioning and their Integration", Springer 2014
- George W. Stimson et al, "Introduction to Airborne Radar (Radar, Sonar and Navigation)" 3rd Edition, Scitech Publishing, May 30, 2014

5.3 COURSE MANAGEMENT: BRIGHTSPACE

Course information, lectures, quizzes, assignments, and grades will be posted on the ELEC 4504 Brightspace site. Students are expected to regularly check the Brightspace site for course handouts, lecture notes and course announcements.

6 COURSE REQUIREMENTS

There will be two quizzes and one final exam. The final exam is for assessment purposes only and will not be returned to the students.

7 EVALUATION AND GRADING SCHEME

The overall grade will be calculated as follows:

Component	Weight
Quiz 1	25%
Quiz 2	25%
Final Exam	50%

Students who fail the final exam (achieve a grade of less than 50% on the final exam) will receive a course grade of F, regardless of their marks in the other components.

8 COURSE DELIVERY

The default course delivery mode is “In-Person section. Not suitable for online students”. However, this may change subject to the prevailing Covid-19 situation. The updated information will be conveyed to you whenever it is available.

E-Proctoring: In case of online course delivery, the tests and examinations in this course will use a remote proctoring service provided by Scheduling and Examination Services. You can find more information at <https://carleton.ca/ses/e-proctoring/>.

9 GENERAL REGULATIONS

Online Requirements:

In case course delivery changed to “Online”, **students are required** to have a stable and reliable internet connection. It will not be possible to accommodate for **missed Quizzes or Exam** due to a dropped internet connection. To reduce the chances of this impacting you it is recommended students use a wired internet connection where possible.

Copyright on Course Materials: The materials created for this course (including the course outline and any slides, notes, assignments, quizzes, exams and solutions) are intended for personal use and may not be reproduced or redistributed or posted on any website without prior written permission from the author(s).

Attendance: Students are expected to attend all lectures periods virtually. The University requires students to have a conflict-free timetable. For more information, see the current *Undergraduate Calendar, Academic Regulations of the University, Section 1.2, Course Selection and Registration and Section 1.5, Deregistration*.

Health and Safety: Every student should have a copy of our Health and Safety Manual. A PDF copy of this manual is available online: <http://sce.carleton.ca/courses/health-and-safety.pdf>

Deferred Term Work : Students who claim illness, injury or other extraordinary circumstances beyond their control as a reason for missed term work are held responsible for immediately informing the instructor concerned and for making alternate arrangements with the instructor and in all cases this must occur no later than three (3.0) working days after the term work was due. The alternate arrangement must be made before the last day of classes in the term as published in the academic schedule. For more information, see the current *Undergraduate Calendar, Academic Regulations of the University, Section 2.6, Deferred Term Work*. Since students are required to have a stable and reliable internet connection, a **poor internet connection will not be considered a sufficient reason to defer an online exam**.

Appeal of Grades : The processes for dealing with questions or concerns regarding grades assigned during the term and final grades is described in the *Undergraduate Calendar, Academic Regulations of the University, Section 2.7, Informal Appeal of Grade and Section 2.8, Formal Appeal of Grade*.

Academic Integrity: Students should be aware of their obligations with regards to academic integrity. Please review the information about academic integrity at:

<https://carleton.ca/registrar/academic-integrity/>. This site also contains a link to the complete Academic Integrity Policy that was approved by the University's Senate.

Plagiarism: Plagiarism (copying and handing in for credit someone else's work) is a serious instructional offense that will not be tolerated.

Academic Accommodation: You may need special arrangements to meet your academic obligations during the term. You can visit the Equity Services website to view the policies and to obtain more detailed information on academic accommodation at <http://www.carleton.ca/equity/>. For an accommodation request, the processes are as follows:

- **Pregnancy or Religious obligation:** Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details see <https://carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf>
- **Academic Accommodations for Students with Disabilities:** The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your *Letter of Accommodation* at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (*if applicable*). **Requests made within two weeks will be reviewed on a case-by-case basis.** After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website (www.carleton.ca/pmc) for the deadline to request accommodations for the formally-scheduled exam (*if applicable*).
- **Survivors of Sexual Violence:** As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and where survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit: <https://carleton.ca/sexual-violence-support/>.
- **Accommodation for Student Activities:** Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform at the national or international level. Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, see <https://carleton.ca/senate/wp-content/uploads/Accommodation-for-Student-Activities-1.pdf>