ASEN 3046 Syllabus

Fall 2025

# Instructor and Course Information

## Instructor Information

### Contact Information

**Name:** Dr. James Byrne

**Email:** james.byrne-1@colorado.edu

**Office Location:** 205 Lesser House (Lesser House is just across Colorado Avenue from the DLC)

**Student Hours:** Wednesdays, 11:30am – 1:00pm in my office in the Lesser House. Thursdays, 10:30am – 12:00pm in the Engineering Center Main Lobby (the area where the front desk and the Dean’s offices are). Or by appointment – send me an email or speak to me before or after class if you’d like to meet at a different time.

**Note on student hours:** These are for you! You don’t need an appointment, and you can come by anytime you’d like to talk to me. The only thing that I promise I’m qualified to help with is material for this class, but I’ll do my best to help with anything. You’re also welcome to come by just to chat – I like it when students come to tell me about cool things they’re doing! My Thursday office hours are in the Engineering Center lobby in case that’s more convenient for you. I like my office in the Lesser House, but it’s a little out of the way, and it’s not very accessible.

### Teaching Fellows

Rudolf Hansen (Rudolf.Hansen@colorado.edu)

Schelin Ireland (Schelin.Ireland@colorado.edu)

### Instructor Bio

I am a Teaching Assistant Professor in the Herbst Program for Engineering, Ethics, and Society. I’m still relatively new at CU Boulder - this is my second year at the university. I spent the last year in the history department at the U.S. Air Force Academy, and before that I was faculty at a small, liberal arts university in British Columbia called Quest University for eleven years. Academically, I'm a historian of science. I specialize in the history of medieval and early modern European science, and I'm working on a book on how astronomy was taught at medieval universities before Copernicus. I'm looking forward to seeing you all in ASEN 3046!

### Communication Policies

The preferred way to contact us is via email (rather than messages on Canvas. **For questions about assignment logistics, due dates, grading, or class attendance, please contact the Ts first. We will make every effort to respond within 24 hours.** If your questions is urgent and someone has not responded to you, please feel free to send a follow-up email.

If we need to send a communication to you individually, we will use email. If we’re sending a message to the entire class, we’ll use the Canvas announcement system, so be sure to check your Canvas notifications regularly.

## Course Information

### Course Description

This course investigates manned aviation and how it has impacted our lives.
We begin by reviewing the history of civilian manned aviation, starting in 1783 with the Montgolfier’s and proceed through the major historic events that have advanced aircraft developments. We consider how each new historic milestone in aircraft development has impacted society and our acceptance of manned flight.

We then consider the history military aviation, focusing on debates about the role and effectiveness of military airpower and its emphasis on strategic bombing.

Students will gain an understanding of just how rapidly aviation has developed over the last century and how challenging it has been to adapt our psychological and physiological limitations to such dangerous environment. We will do this by looking at aviation accidents from the position of human error.

We then explore current issues in aviation, focusing on ethical issues facing aviators, engineers, and policy makers.

### Course Objectives

####  Learning Goals

* Engineering students gain knowledge of how technological development, and especially flight technologies and systems, are a product of political, economic, and social change.
* Students gain an understanding of the current issues and debates in the ethical and social dynamics of aerospace development, including the impact of drones, AI, and climate change on the industry.
* Students interrogate relevant concepts and terms in the field of science and technology studies.

#### Measurable Outcomes

* Students practice forming persuasive and well-researched arguments in both written and discussion settings
* Students gain skills in evaluating and assessing different forms of evidence – including formal writing, statistical data, popular cultural texts, and others

### Required Texts

1. Either *Flight the Complete History of Aviation* By R.G. Grant, DK Publishing (2007). ISBN-10: 0756619025
**OR** *Flight: 100 Years of Aviation* By R.G Grant DK Publishing (2007) ISBN-10: 0756653460
(These are the same book under different titles. Copies are available at the campus bookstore)
2. *Handbook of Aviation Human Factors*, 2nd Edition (Human Factors in Transportation) Wise, Hopkins and Garland (hardcover 2009).
\*\*\*Digital copies are available via the CU Library \*\*\*
<http://dx.doi.org.colorado.idm.oclc.org/10.1201/b10401>

[Digital Edition (links to an external site).](http://dx.doi.org.colorado.idm.oclc.org/10.1201/b10401)

All other required texts will be available via the course Canvas site.

### Method of Instruction

This course will be taught in person, and attendance in class is expected. The class lectures will be recorded using CU’s Class Capture service – you’ll see a link for Lecture Videos on the left side of the course canvas page. This is my first time using this service, so I’m hoping that it works well for the class. It’s not intended as a substitute for attending class in person, and it won’t necessarily be a complete record of what happened during class. For example, we’ll frequently have short in-class discussions, and our classroom is only set up to capture the instructor, not anything that students say. I will also post the slides for class lectures to our Canvas page after class.

###  Accommodations and In-Class Exams

Those using extended time for in-class exams will have a separate room in which they can take the exam – I’m still working on securing a room, and I will update the syllabus when I know what it is. The extended exams will start at the same time as our normal class and last for an extra 45 minutes (until 6pm). On exam days, if you’re taking the extended-time exam, go straight to that classroom. There won’t be anything else happening in class on exam days, so once you’re finished with the exam, you’re welcome to leave as normal.

 All other graded assignments will happen outside of class. My goal is to make the goal as accessible as possible for everyone and to support each of you in your learning. If you have a need that I can address, please get in touch with me as soon as possible via email, and we can develop a solution that works for you. Note that there’s also a statement about accommodations in the policies section later in the syllabus. That’s the general university statement, and it applies here, too, but I also wanted to include something specifically about this course.

## Assignments and Grading

### Assignments

**In-class written participation (during class throughout the semester**): During many classes in the semester, we’ll look at a primary source – a historical document – and we’ll have some discussion of it in class. As part of that, you’ll often be asked to post your thoughts on the source to a Canvas discussion as an assignment. These won’t be graded on their quality – if you post something that’s a legitimate response to the source, you’ll get full credit. This is both a way of adding a participatory element to class and a way of practic3ing some of the skills you’ll draw on in the exams and writing assignments. We’ll do about 18 of these during the semester, but only your best 15 will count towards your final grade, so you’ll have some wiggle room if you miss a class.

**In-class exams (Sep. 18, Oct. 16, Nov. 20):** There will be three in-class exams during the course. These will be primarily multiple choice, but they may also have short discussion questions. The exams will focus on interpreting the primary sources that we have discussed and written about in class and on integrating them with the context from our lectures and textbooks.

**Writing assignment 1 – Scientific American article (Draft due Sep. 26 at 11:59pm; Revision due Oct. 3 at 11:59pm):** You’ll have two writing assignments for this class. For the first one, you’ll write an article for Scientific American, as if it’s 1957 or 1958, , focused on the Boeing 707, the first widely used jet airliner.

**Writing assignment 2 – US Air Forces Report (Draft due Oct. 24 at 11:59pm; Revision due Oct. 31 at 11:59pm):** For your second writing assignment, you’ll draw on material from the US Strategic Bombing Survey that was conducted for WWII to develop a report that makes a recommendation to the US Secretary of Defense, as if it is 1946, about the use of air forces in the US military.

**Final group video presentation (due Dec. 5 at 11:59pm):** For your final project, you will be in small groups. As a group, you will choose an aircraft accident and make a video presenting an Aircraft Incident Investigation. You’ll also submit a short written brief with your presentation.

### Final Grade Points

Your final grade will be calculated out of a total of 100 points. Each assignment is worth the following:

**In-class written participation: 15** points (1 point each; best 15 out of ~18)

**Three in-class exams:** 30 points (10 points each)

**Writing assignment 1 draft:** 3 points

**Writing assignment 1 revision:** 12 points

**Writing assignment 2 draft:** 5 points

**Writing assignment 2 revision:** 15 points

**Final group presentation:** 20 points

**Total:** 100 points

### Grading Scale

Grades will be assigned using the standard CU Boulder 100-point scale:

|  |  |
| --- | --- |
| **Letter Grade** | **Percentage Grade** |
| A | 94-100 |
| A- | 90-93 |
| B+ | 87-89 |
| B | 83-86 |
| B- | 80-82 |
| C+ | 77-79 |
| C | 73-76 |
| C- | 70-72 |
| D+ | 67-69 |
| D | 63-66 |
| D- | 60-62 |
| F | 0-59 |

### Drafts and Final Revision Grading

Both writing assignments have a mandatory draft. The class is too big for us to give you individual feedback on your draft, but the week after drafts are due, we will have a class in which we go over some common issues and have a peer feedback workshop. The drafts are assigned points in your final grade, but they won’t receive a separate letter grade. Instead, if you submit your draft complete and on time, it will receive the same grade as your final revision. If you submit your draft late, but before the in-class workshop day, or incomplete but still with substantial effort, you’ll receive a 50% on the draft. If you don’t submit the draft by the workshop class or submit a seriously incomplete draft, you will receive a zero. For example, if you submit your draft complete and on time, and you receive a 90% on the final revision, you’ll also receive a 90% on your draft.

### Late Assignments

Late assignments will receive a 5-point penalty, plus an additional five points for each 24 hours they are late. Note that there is a different policy for drafts – see the section above.

# Class Schedule

### Schedule

#### Week 1 - Intro

Thursday, August 21 – Class introduction

#### Week 2 – The Invention of Flight

*Reading*: Grant, Ch. 1

Tuesday, August 26 – Flight in the 19th century

Thursday, August 28 – The Wright Brothers and early aviation

#### Week 3 – Civil Aviation: The Rise of Civil Aviation

*Reading*: Grant, Ch. 3

Tuesday, September 2 – Innovation and air mail

Thursday, September 4 – The first airlines

#### Week 4 – Civil Aviation: The Jet Age

*Reading:* Grant, Ch. 7

Tuesday, September 9 – The postwar context

Thursday, September 11 – Jets take over

#### Week 5 – Civil Aviation: The Economics of Aviation

Tuesday, September 16 – Why Boeing and Airbus?

**Thursday, September 18 – Exam 1**

#### Week 6 – Military Aviation: WWI and its aftermath

*Reading:* Grant, Ch. 2

Tuesday, September 23 – Aviation in WWI

Thursday, September 25 – Interwar fears

**Friday, September 26 – Writing Assignment 1 draft due (due to Canvas at 11:59pm)**

#### Week 7 – Military Aviation: WWII

*Reading:* Grant, Ch. 4

Tuesday, September 30 – Writing workshop

Thursday, October 2 – WWII and strategic bombing

**Friday, October 3 – Writing Assignment 1 revision due (due to Canvas at 11:59pm)**

#### Week 8 – Military Aviation: A Revolution in Military Affairs?

*Reading:* Grant, Ch. 5

Tuesday, October 7 – Failures in Vietnam, successes in Iraq?

**\*Thursday, October 9 – No class (mid-semester reading day)\***

#### Week 9 – Military Aviation and Human Factors

Tuesday, October 14 – Military aviation and training

Guest Lecturers: Maj. Lisa Ventura and Maj. Ben Jones

**Thursday, October 16 - Exam 2**

#### Week 10 – Intro to Human Factors

*Reading:* Wise, Hopkin, and Garland, Chs. 1 & 5

Tuesday, October 21 – Human factors in complex systems

Thursday, October 23 – Organizational behavior

**Friday, October 24 – Writing Assignment 2 draft due (due to Canvas at 11:59pm)**

#### Week 11 – Human Performance

*Reading:* Wise, Hopkin, and Garland, Chs. 11 & 12

Tuesday, October 28 – Writing workshop

Thursday, October 30 – Human performance and aviation safety

**Friday, October 31 – Writing Assignment 2 revision due (due to Canvas at 11:59pm)**

#### Week 12 – Leadership and Culture

*Reading:* Wise, Hopkin, and Garland, Chs. 9 & 10

Tuesday, November 4 – Leadership and culture

Thursday, November 6 – Flex (Dave Laslo)

#### Week 13 – Contemporary Issues in Aviation

Tuesday, November 11 – Flex

Thursday, November 13 – Aviation and the environment

#### Week 14 – Contemporary Issues in Aviation

Tuesday, November 18 – The ethics of drone warfare

**Thursday, November 20 – Exam 3**

#### Week 15

**\*Fall Break - No class Nov 24-28\***

#### Week 16 – Wrap-up

Tuesday, December 2 - Flex

Thursday, December 4 – Class conclusion

**Friday, December 5 – Final Group Presentation due (due to Canvas at 11:59pm)**

## Course and University Policies

## Honor Code

All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the[Honor Code](https://www.colorado.edu/sccr/media/229). Violations of the Honor Code may include but are not limited to: plagiarism (including use of paper writing services or technology [such as essay bots]), cheating, fabrication, lying, bribery, threat, unauthorized access to academic materials, clicker fraud, submitting the same or similar work in more than one course without permission from all course instructors involved, and aiding academic dishonesty. Understanding the course's syllabus is a vital part in adhering to the Honor Code.

All incidents of academic misconduct will be reported to Student Conduct & Conflict Resolution: StudentConduct@colorado.edu. Students found responsible for violating the[Honor Code](https://www.colorado.edu/sccr/media/229) will be assigned resolution outcomes from the Student Conduct & Conflict Resolution as well as be subject to academic sanctions from the faculty member. Visit [Honor Code](https://www.colorado.edu/sccr/media/229) for more information on the academic integrity policy.

### Specific Honor Policies for this Class

This is a writing class, so most graded work you’ll submit for this class will be written assignments. Here is some more specific information about how to adhere to honor guidelines for your work in this class:

* In your assignments, you must follow guidelines for properly citing or crediting sources (these will be explained in each assignment’s information sheet).
* You do not need to cite information that I tell the class (consider it common knowledge for the purposes of this course).
* You must follow academic norms for quotation, paraphrase, and summary (i.e., quotations must be the author’s exact words and be indicated as such; paraphrases and summaries must be your own words and must not be “patchwritten”).
* Assignments that you submit must be your original work, meaning that the claims and analysis that they make must fundamentally be the result of your own thinking about the evidence and sources you have available, rather than someone else’s ideas.
* You may, however, discuss your ideas with others and receive feedback on your work from others. Indeed, you are encouraged to do so. If you receive feedback from anyone other than me or a classmate in class, please include a brief acknowledgement of that at the beginning or end of your writing.
* Any use of generative AI in the course must adhere to the course policy on acceptable AI use (given below). This includes acknowledging and describing your use of AI if you’ve done so.
* You must fact-check your work to ensure your references (including things such as quotations and summaries) are factual, *especially* if you are using generative AI (see the guidelines below for more on this).
* Unless you have received clearance from me to do otherwise, work that you submit for this course must be unique to this course – you may not use all or portions of assignments submitted for other courses.

In general, when assessing academic integrity, I will distinguish between plagiarism (passing off others’ work as your own) and misuse of sources (trying to acknowledge others’ work, but doing so improperly, for example by failing to cite properly or “patchwriting” a paraphrase or summary). Plagiarism is a violation of academic integrity and will be treated as such following university policies. Misuse of sources, unless it’s egregiously sustained (e.g., we work together on fixing the issue more than once, and it’s still repeated), will be treated as a teaching and learning problem – it’ll be reflected in your grade, but not treated as an academic integrity issue.

## Acceptable Use of AI

In general, you must use AI in this course in a way that is consistent with course learning goals and CU’s Honor Code. During Week 5 of the class, we’ll have a session focused on the use of AI in writing, but it’s important that you adhere to this policy throughout the course. Here are the specific guidelines:

*You MAY:*

* Use proofreaders and spellcheckers such as Word’s built-in functions or Grammarly’s basic review function.
* Use LLMs (such as GPT, Claude, or Gemini) to generate ideas or offer feedback on your writing. If you do this, you must also submit a short explanation of how you used the AI along with your assignment. If you do this, it would also be wise to do a sanity check on anything the AI generates - LLMs can produce both obvious and subtle mistakes.
* Use LLMs to generate ideas or sources for further research. Again, if you do this, it would be wise to do a sanity check.

*You MAY NOT:*

* Directly submit text that was written by an LLM as your own work.
* Use LLMs (including Grammarly’s generative AI function) to rewrite your words directly (e.g., by using the “Improve It” function on Grammarly, or feeding all or part of your writing into Chat-GPT and prompting it to rewrite it). You should be careful doing this in general, even in situations when it is permitted! Even when prompted to rephrase, LLMs will frequently change the meaning of what you’ve written in both overt and subtle ways.

*If you use generative AI, you MUST:*

* Check any references the AI generates to ensure they are correct – this includes things like quotations, paraphrases, and summaries sources (both primary and secondary) and references to historical figures or events. AIs can and do “hallucinate,” even when you ask for quotations. **Including “hallucinated” material in your submitted assignments is grounds for an F**, even if you followed the other guidelines for using AI. This doesn’t mean that you’ll fail if you misunderstand or misinterpret a source, or if you struggle with its context. It means that if you, for example, include a “quotation” that isn’t actually in the source, say that it discusses something that it doesn’t, or reference a historical figure or event that didn’t happen, you’re committing an academic integrity violation by failing to take responsibility for the basic factual integrity of your work.
* Include a brief statement explaining how you used the AI. It’s not necessary to submit the prompts that you gave and the responses the AI gave, but it would be wise to save these (both for my course and any others in which you’re using AI) in case questions arise about how you’ve used AI or what the AI has told you.

Finally, note that you are ultimately the one who is responsible for your work. I don’t think it’s reasonable or feasible to forbid you from using AI entirely, so I’ve tried to set guidelines for its use that I think are compatible with you doing the learning you’re meant to achieve in this course. But you’re the human, so you’re the one with judgment and agency. Be wary of how you’re using AI, even if it’s within the acceptable bounds for the class. AI can make all manner of mistakes, and while it might be easy to catch obvious “hallucinations,” subtle mistakes can be especially pernicious. Likewise, part of the nature of taking a class is that I’ve got a lot more expertise than you do on most of the subjects you’ll be writing about (otherwise I wouldn’t be teaching the course!). That means that AI-generated mistakes that are clear to me might not be immediately obvious to you. But you’re the one who’s submitting the assignment, so you’re the one who’s responsible for everything in it. “The AI told me it was ok” isn’t a reasonable excuse for anything that’s gone wrong in an assignment. Use your own judgment and take responsibility for what you produce!

### My Use of AI

For the most part, I won’t use AI in generating course materials. I’ll never use it to generate assignments or for assessing or giving feedback for your work. There are two main areas in which I may use AI: first, to aid in producing written descriptions of visual sources for accessibility purposes. If I do this, the description will always say that it was produced with the aid of AI, and I’ll always edit it to ensure that it’s correct and sufficient. Second, at several points of the course, we’ll have some in-class discussion about using AI for academic work. I’ll use samples of prompts and AI-generated responses for teaching purposes in these sessions, so that we can discuss the results.

## Accommodation for Disabilities, Temporary Medical Conditions, and Medical Isolation

If you qualify for accommodations because of a disability, please submit your accommodation letter from Disability Services to your faculty member in a timely manner so that your needs can be addressed.  Disability Services determines accommodations based on documented disabilities in the academic environment.  Information on requesting accommodations is located on the [Disability Services website](https://www.colorado.edu/disabilityservices/). Contact Disability Services at 303-492-8671 or DSinfo@colorado.edu  for further assistance.  If you have a temporary medical condition, see [Temporary Medical Conditions](https://www.colorado.edu/disabilityservices/students/temporary-medical-conditions) on the Disability Services website.

If you have a temporary illness, injury or required medical isolation for which you require adjustment, contact me via email as soon as you’re able. If you’re only missing one class, it will likely be sufficient to talk to a classmate about what we covered and come see me in Student Hours for extra instruction if necessary. If you’re going to miss an extended period, we’ll work together to develop a plan that meets your needs and lets you meet the course requirements.

## Accommodation for Religious Obligations

Campus policy requires faculty to provide reasonable accommodations for students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. Please communicate the need for a religious accommodation in a timely manner. For this class, please examine the schedule due dates in the syllabus at the beginning of the course and check to see whether you anticipate any conflicts. If you do, please email me by the end of day 2 of the course, and I will work with you to develop a plan that meets your needs. If a conflict arises unexpectedly, please contact me via email as soon as you are able. See the [campus policy regarding religious observances](https://www.colorado.edu/compliance/policies/observance-religious-holidays-absences-classes-or-exams) for full details.

## Preferred Student Names and Pronouns

CU Boulder recognizes that students' legal information doesn't always align with how they identify. Students may update their preferred names and pronouns via the student portal; those preferred names and pronouns are listed on instructors' class rosters. In the absence of such updates, the name that appears on the class roster is the student's legal name.

## Classroom Behavior

Students and faculty are responsible for maintaining an appropriate learning environment in all instructional settings, whether in person, remote, or online. Failure to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, marital status, political affiliation, or political philosophy.

For more information, see the [classroom behavior policy](https://www.colorado.edu/compliance/policies/student-classroom-course-related-behavior), the[Student Code of Conduct](https://www.colorado.edu/sccr/media/230), and the [Office of Institutional Equity and Compliance](https://www.colorado.edu/oiec/).

## Sexual Misconduct, Discrimination, Harassment and/or Related Retaliation

CU Boulder is committed to fostering an inclusive and welcoming learning, working, and living environment. University policy prohibits [protected-class](https://www.colorado.edu/oiec/policies/discrimination-harassment-policy/protected-class-definitions) discrimination and harassment, sexual misconduct (harassment, exploitation, and assault), intimate partner abuse (dating or domestic violence), stalking, and related retaliation by or against members of our community on- and off-campus. The Office of Institutional Equity and Compliance (OIEC) addresses these concerns, and individuals who have been subjected to misconduct can contact OIEC at 303-492-2127 or email CUreport@colorado.edu. Information about university policies, [reporting options](https://www.colorado.edu/oiec/reporting-resolutions/making-report), and [OIEC support resources](https://www.colorado.edu/oiec/support-resources) including confidential services can be found on the [OIEC website](http://www.colorado.edu/institutionalequity/).

Please know that faculty and graduate instructors are required to inform OIEC when they are made aware of incidents related to these concerns regardless of when or where something occurred. This is to ensure that individuals impacted receive outreach from OIEC about their options and support resources. To learn more about reporting and support for a variety of concerns, visit the [Don’t Ignore It](https://www.colorado.edu/dontignoreit/) page.

## Mental Health and Wellness

The University of Colorado Boulder is committed to the well-being of all students. If you are struggling with personal stressors, mental health or substance use concerns that are impacting academic or daily life, please contact [Counseling and Psychiatric Services (CAPS)](https://www.colorado.edu/counseling/) located in C4C or call (303) 492-2277, 24/7.

Free and unlimited telehealth is also available through [Academic Live Care](https://www.colorado.edu/health/academiclivecare). The [Academic Live Care](https://www.colorado.edu/health/academiclivecare) site also provides information about additional wellness services on campus that are available to students.