

**Aerospace Engineering
Honors Program
Student & Faculty Handbook
2017-2018**

**Department of Aerospace Engineering
3179 Glenn L. Martin Hall
University of Maryland, College Park
301.405.2376**

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Contact Information

Dr. Raymond J. Sedwick
Associate Professor and Director Aerospace Engineering Honors Program
3146 Glenn L. Martin Hall
301.405.0111; sedwick@umd.edu

Ms. Briana O'Neal
Undergraduate Programs Coordinator
3179P Glenn L. Martin Hall
301.405.1519; bnoneal@umd.edu

Ms. Aileen Hentz
Assistant Director Aerospace Engineering Undergraduate Studies
3179G Glenn L. Martin Hall
301.405.1980; anhentz@umd.edu

Dr. Norman Wereley
Professor and Department Chair
3179J Glenn L. Martin Hall
301.405.1927; wereley@umd.edu

Honors Program Committee:

Dr. Christopher Cadou
Dr. Alison Flatau
Dr. Raymond Sedwick
Dr. Norman Wereley
Dr. Stuart Laurence

Mission Statement

The Honors Program in the Department of Aerospace Engineering at the University of Maryland (UMCP) is intended to provide rigorous and comprehensive education for a career in technical leadership and scientific or engineering research. The program is intensive and is intended only for students with the top undergraduate grade point averages in the Department of Aerospace Engineering.

Provisional Acceptance into the Honors Program

All Aerospace undergraduate students will be evaluated after completion of 30 credits and registration for ENAE283, Introduction to Aerospace Systems. Provisional acceptance into the Program by the Undergraduate Committee will be based on their UMCP cumulative grade point average, and progress towards a bachelor's degree in Aerospace Engineering.

Typically, students will have at least a 3.7 GPA, although the GPA cutoff may be higher in any given year. Students (including transfer students) not invited to the Aerospace Engineering Honors Program, may request admission into the Aerospace Engineering Honors Program. Historically, the top 15-20% of the aerospace sophomore-level class is invited to join the Aerospace Honors Program.

Students must have completed the following coursework (or its equivalent) to be considered for invitation to the program:

- MATH140 & 141, Calculus I and II
- CHEM135 Chemistry to Engineers or CHEM113 Chemistry II
- PHYS161 Physics I
- ENES100 Introduction to Engineering Design
- ENES102 Statics
- ENAE100 The Aerospace Engineering Profession (may be waived for transfer students)
- ENAE202 Aerospace Computing
- 2 Gen Ed program requirements (6 credits, 3 credits of which should be Academic Writing)

Upon posting of spring semester grades, the Honors Program Committee meets to review all eligible students. An email invitation is sent to the prospective honors students inviting them to join the program. This invitation directs students to switch their ENAE283 registration to ENAE283H; both sections are offered at the same time in the schedule of classes.

Requirements of Program

Once accepted into the aerospace department's honors program, students must complete the prescribed coursework (or its equivalent) for a degree in aerospace engineering at the University of Maryland.

Sophomore Year

Completion of the following classes:

- MATH240 or 461 Linear Algebra
- MATH241 Calculus III
- MATH246 Differential Equations
- PHYS260/261 Physics II with lab
- PHYS270/271 Physics III with lab
- ENAE200 - The Aerospace Profession II
- ENES220 - Mechanics of Materials
- ENES232 - Thermodynamics
- 2 Gen Ed program requirements (6 credits)

Aerospace honors students must also have successfully completed (grade of 2.0) ENAE283H Introduction to Aerospace Systems (Honors section), and students must have a cumulative GPA of at least 3.50 by the end of their sophomore level coursework.

Students not able to take 283H due to transfer status or other circumstances may request a special exception and admission into the Aerospace Engineering Honors Program.

Junior Year

Completion of the following classes:

- ENGL393 Technical Writing
- ENAE301 Dynamics of Aerospace Systems
- ENAE324 Aerospace Structures
- ENAE362 Aerospace Instrumentation and Experiments
- ENAE380 Flight Software Systems
- ENAE432 Control of Aerospace Systems (or Honors section if available)
- Aeronautical Track: ENAE414 Aerodynamics II
- Astronautical Track: ENAE404 Space Flight Dynamics
- 2 Gen Ed program requirements (6 credits)

AND successful completion (grade of 2.0) of the following honors classes:

- ENAE311H Aerodynamics I (Honors section)
- ENAE398H, Honors Research Project (1 credit, faculty advisor section), provided the student wishes to receive an Aerospace Honors citation (see below).

Students must have a cumulative GPA of at least 3.50 by the end of their junior level coursework.

Senior Year

Completion of the following classes:

- ENAE464 Aerospace Engineering Lab
- Any remaining Gen Ed
- All Technical and Aerospace Electives

EITHER Completion of the following classes in the Aeronautical Track

- ENAE403 Aircraft Flight Dynamics
- ENAE455 Aircraft Propulsion and Power
- ENAE481 Principles of Aircraft Design
- ENAE482 Aeronautical Systems Design

OR Completion of the following classes in the Astronautical Track

- ENAE441 Spacecraft Navigation and Guidance
- ENAE457 Space Propulsion and Power
- ENAE483 Principles of Space Systems Design
- ENAE484 Space Systems Design

AND Completion of the following honors classes:

- ENAE423H Vibration and Aeroelasticity (Honors section)
- ENAE398H Honors Project & Thesis (2 credits, faculty advisor section), provided the student wishes to receive an Aerospace Honors citation (see below).

Completion of the program requires a cumulative GPA of at least 3.50 and no repeats of ENAE courses. If at any time, an Honors student's cumulative GPA falls below the required GPA, the student must meet with the Honors Program Director to discuss his or her course work, and provide a plan to improve his/her GPA.

Discontinuation and Dismissal

- If a citation-seeking Honors student chooses to discontinue in the Aerospace Honors Program, he or she must meet with the Honors Program Director to discuss this decision.
- If a student fails to maintain a 3.50 GPA after implementing his/her improvement plan, the Honors Program Director will provide a letter dismissing the student from the program.
- Honors students who violate the university's Code of Academic Integrity at any point are immediately dismissed from the program.
- Honors students who violate the terms of the signed Aerospace Honors Contract at any point may be dismissed from the program.

Graduating with Aerospace Honors

Completion of the program requires a cumulative GPA above or equal to 3.50, and no repeats of ENAE courses.

For those students wishing to pursue the Aerospace Honors Citation

Students who have completed all prescribed coursework for a degree in aerospace engineering, all prescribed aerospace honors coursework and requirements, maintained the required GPA, **and completed the research requirement** (see pages 9-11) will be identified to the School of Engineering and the University of Maryland's Office of the Registrar as 'Graduating with Aerospace Honors'. This distinction will be made on the student's transcript, and in the Commencement Program.

In the spring of the student's graduation calendar year, he/she is invited to participate in the Aerospace Engineering Honors Convocation, typically held the afternoon of University-wide commencement. August and December graduates may participate in the May convocation given they have completed their honors project and thesis by that date. At this ceremony, students will be presented with a certificate of completion and a medallion that can be worn during commencement activities.

Students will receive a black tassel with their mortar board cap from the University Bookstore; however Aerospace Honors tassels (red in color) will be distributed by the Clark School of Engineering's Office of Undergraduate Advising & Academic Support. Students will receive notification by email when these tassels are available for pick-up.

For those students NOT wishing to pursue the Aerospace Honors Citation

Starting in the Summer of 2017, provisional invitation into the honor program will be extended to the top 25 Sophomores and top 30 Juniors in the Aerospace Engineering program. While all of these students are considered as participants of the honors program, only those students who choose to conduct, and successfully complete, an honors research project with a faculty advisor or an approved mentor will officially graduate *with aerospace honors* and be invited to participate in the convocation ceremonies. The purpose of this change is to extend the opportunity to participate in the honors courses to a larger group of students than it may be possible for the faculty to support in research, and to provide flexibility to the students to still participate in these courses even if conducting research is not of interest to them. The choice and the *responsibility* to transition from a provisional to a fully citation-seeking honors student is entirely that of the individual student. Once a student begins approved research they are no longer considered provisional, however failure to meet any of the requirements or deadlines of the research program will make the student ineligible for the honors citation and return them to provisional status.

Research Project and Thesis
ENAE398H

Choosing a Topic and a Faculty Honors Advisor

The Honors Project & Thesis provides students with a valuable experience that relates to students' interests and career goals. The abilities developed during the process of completing this thesis/project: researching; creating; analyzing and evaluating data; and writing and speaking about the knowledge and conclusions are highly advantageous to the student's future success.

Students should carefully consider their decision regarding the selection of their faculty honors project advisor and research topic. In addition to aerospace and other technical academic coursework, internships, co-ops, or other research experience, can help to select a focused topic area. Past academic activities, such as short papers and readings from a variety of courses, may also help to determine a starting point.

A faculty honors project and thesis advisor might be an instructor in a previous course or someone who has supervised another research experience. Students should review faculty profiles (<http://www.aero.umd.edu/faculty>), Aerospace Department research labs (<http://www.aero.umd.edu/research-labs>), professional journals, and conference proceedings, and to talk with other students, especially those who are at the next level of their coursework or have worked with a proposed faculty honors advisor. This should be done starting in the Fall of the Sophomore year.

It is the responsibility of the student to conduct the background research and meet with prospective faculty advisors to make their final selection of advisor and topic.

Once you have narrowed down your area of research to two or three possible advisors and topics, make an appointment with these faculty members to discuss your ideas and their ability to mentor and advise you on a research topic. The faculty honors advisor should be qualified in the topic area, have a significant interest in the field, and be willing to work with you.

After a topic idea has been developed, students fill out the Aerospace Engineering Honors Project and Thesis Approval form (located [here](#)) which will be automatically submitted to Briana O'Neal. Preliminary identification of a faculty advisor and a potential research topic must be completed by the **end of the Fall semester of Junior year**. Depending on the agreement between the student and the faculty advisor, the research component could start as early as the Summer following the Sophomore year, but must begin **no later than the start of the Spring semester of the Junior year**.

Aerospace Honors Research Project (ENAE398H)

Students in the aerospace honors program who wish to graduate with the honors citation are required to register for one credit of ENAE398H over three semesters for a total of three credits, which together will fulfill the aerospace degree requirements for the aerospace elective. Those completing the program on the nominal four-year schedule can register for 398H starting in the Fall semester of their Junior year, but must register for the first credit no later than the Spring semester of their Junior year, followed by the Fall and Spring semesters of their Senior year. Students who have pursued co-op, internship, or study abroad opportunities, or who have had other extenuating circumstances, and may be graduating in August or December may need to register for

398H on a different schedule, but should plan on registering for one credit in each of their final three semesters.

Honors students will register for the section number of 398H corresponding to their faculty research advisor, following approval of their honors project/thesis topic. The grade for each credit of 398H will be given by the research advisor, based on the performance of the student during that semester. Once the proposed honors research project has been decided upon and approved, students and their faculty advisors should set-up a timeline for project and thesis completion. This timeline should include regular meetings with, and progress updates presented to, the advisor; this also allows for a forum in which questions can be asked and answered by both the student and the advisor.

It is often the case that students will work on their honors research project over the Summer between their Junior and Senior years, and occasionally between their Sophomore and Junior years. Historically, students that do this produce a much better overall research product, since their efforts over the summer can be more focused. In some cases, it may be possible for the student to conduct this research for pay, provided that funds are available for the project. However, this is often contingent upon the student demonstrating a strong commitment to the project during the regular academic semesters, so it is in the best interest of the student to meet (or exceed) the expectations set forth during these semesters.

While graduate students and/or post-doctoral or other research staff can provide guidance and feedback in the honors research, the faculty advisor is the sole advisor and should serve as such. If an honors student feels that he/she is not receiving guidance and direction on their research project or thesis, he/she should discuss his/her concerns with the faculty advisor, and if not resolved he/she should then discuss these concerns with Honors Program Director as soon as possible.

Students may be exempt from registering for ENAE398H if they complete external research and present it at a professional conference as part of an independent program (e.g. fellowship). Students will still be required to submit the research paper they produce to fulfill the honors requirement. Students who choose to do this may still register for ENAE398H to count as their aerospace elective or may select another elective course to replace it. Please contact the Honors Program Director prior to the Fall of your Junior year if you are considering this option

Aerospace Honors Thesis & Presentation

The Honors thesis is written on research performed at or with the University of Maryland's aerospace department and an approved faculty member. Students should begin their honors project research as soon as possible, but at the latest by the start of the Spring semester of their Junior year. A completed copy of the [honors project approval form](#) with uploaded e-mail approval from your honor's adviser must be submitted to Briana O'Neal in order to register for the faculty honors advisor's section of ENAE398H. Once this project is approved, students will not be allowed to change faculty honors advisors without meeting with the Honors Program Director and must have justified reasons for this change.

The final thesis must be thorough, typed, and can be related to either experimental or analytical work. The Honors Thesis should follow the standard format and the stylistic

conventions of the engineering profession. Examples of previous honors theses are located on the aerospace engineering website. Because the research must be presented at the AIAA Regional Student Conference in the Spring of the student's Senior year, a manuscript must be prepared according to the formatting rules of the AIAA. Templates can be found at <https://www.aiaa.org/Secondary.aspx?id=4597> for both MS Word and LaTeX.

This manuscript can serve as the basis of the thesis document, however as the manuscript will often present a summary of the research effort, it may need to be supplemented with one or more appendices that will include additional data or analysis that is not submitted as part of the conference manuscript itself. The extent of the thesis beyond what is presented at the conference will be at the discretion of the faculty advisor.

A 20 minute oral presentation of the research must also be prepared and given at the conference. If there is a compelling reason that the student cannot present at the AIAA regional student conference, a public presentation of the thesis project must be agreed upon by the faculty advisor and the Honors Program Director.

An electronic copy (PDF or doc) of the final thesis must be received by Briana O'Neal by the end of the student's last completed semester at the University of Maryland. This will be housed in the aerospace engineering department's library and online. If the student cannot meet this deadline, the student must notify Briana O'Neal.

Library and Research Resources

The University of Maryland Librarian Subject Specialists may be consulted for help in locating information in their areas of expertise. Robin Dasler is the aerospace engineering librarian, 301-405-9155, rdasler@umd.edu

An excellent resource for acquiring digital copies of most papers is the University of Maryland Library Research Port (<http://www.lib.umd.edu/>). Many journal or professional society conference proceedings that require payment for online access to manuscripts can be accessed for free through the UMD Library Research Port.