MSU DENVER Individualized Degree Program
Center for Individualized Learning

Aerospace Physics Major

Bachelor of Science (B.S.)
Faculty Designed IDP

The degree is offered through the Individualized Degree Program and is not yet a permanent major.

Program Description

This major is for students who are interested in pursuing a Bachelor of Science in the field of Aerospace Physics through the Individualized Degree Program (IDP). With a combination of coursework from multiple departments, including Physics, Aerospace, and Math, the degree provides students with a solid foundation in this interdisciplinary field.

Faculty Liaison from Key Department:

- Dr. Kamran Sahami, Physics
- Dr. Michael Botyarov, Aviation and Aerospace Sciences

IDP Contact:

- Dr. Sara L. Jackson Shumate, Director of Center for Individualized Learning

Recommended General Studies Coursework

All students must complete the General Studies requirements for their catalog year.

Composition/Written Communication (GT-CO, 6 credits required of all students):

- ENG 1010: Composing Arguments (3 credits)
- ENG 1020: Research & Argument Writing (3 credits)

Math/Quantitative Literacy (GT-MA, 3 credits required of all students):

- Any course that meets requirement (3 credits)

Oral Communications (3 credits required of all students)

- Any course that meets requirement (3 credits)

Historical (GT-HI, 3) credits required of all students

- Any course that meets requirement (3 credits)

Arts and Letters/Humanities (GT-AH, 6 credits required of all students):

- Any combination of courses (6) that meets requirements

Social and Behavioral Sciences (GT-SS, 6 credits required of all students):

- Any combination of courses (6) that meets requirements

Natural and Physical Sciences (GT-SC, 6 credits required of all students):

- Any combination of courses (6) that meets requirements

Global Diversity (3 credits)

- Students may fulfill the Global Diversity requirement by taking approved courses within one of the following categories: Arts and Humanities; Historical; Natural and Physical Sciences; Or Social and Behavioral Sciences

Total of required credits for General Studies: 33 to 39 credits

Degree/Graduation Requirements

Ethnic Studies and Social Justice Course (3 credits)

- Students may fulfill this requirement by taking approved courses within one of the following categories: Arts and Humanities; Historical; Natural and Physical Sciences; Or Social and Behavioral Sciences

Senior Experience (3 credits)

- PHY 4611: Computational Physics (2 credits) and PHY 4921: Physics Senior Seminar (1 credit)

Recommended Coursework for IDP

Total credit hours in IDP: 60+ credits

- Core courses (60+ credits)
- Elective courses (additional credits needed to reach 120 total credits)

Highly Recommended Core Courses 60+ credit hours, 34 upper division credit hours

Courses that are critical to the field of study, and which are likely to become required in an eventual curriculum proposal.

- AES 2050: Av. History & Aerospace History Dev (3 credits)
- AES 2607: Intro to Aerospace Sys Sim (3 credits)*
- AES 3530: Aerodynamics (3 credits)
- AES 3600: Space Flight Operations I (3 credits)*
- AES 4601: Space Flight Operations II (3 credits)*
- AES 4602: Aerospace Comm Ops (3 credits)*
- AES 4603: Aerospace Ops Syst Anal & Design (3 credits)*
- JMP 2610: Intro to Technical Writing (3 credits)
- MTH 1210: Introduction to Statistics (4 credits)
- MTH 2410: Calculus II (4 credits)
- MTH 2420: Calculus III (4 credits)
- MTH 3420: Differential Equations (4 credits)
- PHY 2311: General Physics I (4 credits)
- PHY 2321: General Physics I Lab (1 credit)
- PHY 2331: General Physics II (4 credits)
- PHY 2341: General Physics II Lab (1 credit)
- PHY 3231: Vibrations, Waves, and Mathematical Methods (4 credits)
- PHY 3111: Modern Physics I (4 credits)
- PHY 3711: Junior Physics Laboratory (2 credits)
- PHY 3121: Modern Physics II (3 credits)
- PHY 3311: Analytical Mechanics (4 credits)
- PHY 4611: Computational Physics (2 credits)
- PHY 4921: Physics Senior Seminar (1 credit)
- PHY 4950: General Relativity (3 credits) OR PHY 4040: Planetary Physics (3 credits)
- Other courses as suggested by your IDP Faculty Advisor

Major Elective Courses

Students will need to take electives not listed here to meet the 120 credit hours and 39 upper division credits to complete the degree requirements. Talk to your IDP Advisor about how many additional credits you may need to meet the graduation requirements.

Space Commercialization Certificate

Students completing AES 2607, 3600, 4601, 4602, and 4603 (see * in above list) will also earn an MSU Denver certificate in Space Commercialization. This certificate will provide the student with the knowledge to seek opportunities in an important and expanding part of the Colorado and national economy, as well as expand opportunities for those currently employed in the industry.

Total Major Credits: 60+ credit hours, 30+ upper division credit hours

Total Credits to graduate: 120+ credit hours, 39 upper division credit hours

Optional Academic Plan: Aerospace Engineering Technician B.S.

Semester 1 – Fall

- COMM 1010 Presentational Speaking (3 credits) (GS)
- ENG 1010 Composing Arguments (3 credits) (GS)
- MTH 1410 Calculus (4 credits) (GS)
- MTH 1210 Introduction to Statistics (4 credits)
- ESSJ course (3 credits)

Total Credit Hours 17

Semester 2 – Spring

- AES 2050 Av. History & Aerospace History Dev (3 credits)
- CHE 1100 Principles of Chemistry (4 credits) (GS)
- CHE 1150 Principles of Chemistry Lab (1 credit) (GS)
- ENG 1020 Research & Argument Writing (3 credits) (GS)
- MTH 2410 Calculus II (4 credits)

Total Credit Hours 15

Semester 3 – Fall

- PHI 1030 Ethics (3 credits) (GS)
- ECO Principles of Macroeconomics (3 credits) (GS)
- PHY General Physics I (4 credits)
- PHY 2321 General Physics I Lab (1 credit)
- MTH 2420 Calculus III (4 credits)

Total Credit Hours 15

Semester 4 – Spring

- ECO 2020 Principles of Microeconomics
- (3 credits) (GS)
- JMP 2610 Intro to Technical Writing (3 credits)
- PHY 2331 General Physics II (4 credits)
- PHY General Physics II Lab (1 credit)
- Global Diversity course (3 credits)

Total Credit Hours 14

Semester 5 – Fall

- AES 3600 Space Flight Operations I (3 credits)
- MTH 3420 Differential Equations (4 credits)
- PHY 2711 Waves and Vibrations (4 credits)
- PHY Modern Physics I (4 credits)

Total Credit Hours 15

Semester 6 – Spring

- Arts and Humanities Course (3 credits)
- AES 3530 Aerodynamics (3 credits)
- AES 4601 Space Flight Operations II (3 credits)
- PHY Modern Physics II (3 credits)
- PHY 3711 Physical Lab I (2 credits)

Total Credit Hours 14-15

Semester 7 – Fall

- AES 4602 Aerospace Comm Ops (3 credits)
- AES 4603 Aerospace Ops Syst Anal & Design (3 credits)
- History Course (3 credits)
- PHY 3211 Analytical Mechanics (4 credits)
- PHY XXXX (3 credits)

Total Credit Hours 16

Semester 8 – Spring

- AES 2607 Intro to Aerospace Sys Sim (3 credits)
- AES XXXX (3 credits)
- PHY 4611 Computational Physics (2 credits)
- PHY 4921 Physics Senior Seminar (1 credit)
- PHY General Relativity (3 credits)
- Ethnic Studies and Social Justice course (3 credits)

Total Credit Hours 15