

MS in Medical Physiology
Area of Concentration in Aerospace Physiology (AOC in AP)
Resident and/or Online

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Definition of Aerospace Physiology

Aerospace physiology is the study of the physical and cognitive impact of an extreme and/or austere environment upon an individual. Those studies provide the foundation to develop strategies conferring mental and physical resilience against extreme environmental conditions, thereby optimizing performance of the aerospace traveler.

Need

The rapidly emerging aerospace and space tourism industry is enabling “tourists” to travel to suborbital locations, the International Space Station, and potentially, the “Artemis” Moon base, Mars and beyond. Sponsors of those projects range from government agencies such as NASA, the FAA and the European Space agency, to private industries which include Virgin Galactic, Space-X, to the US Space Force, Air Force, Navy and Marines.

Those commercial (civilian) space tourism industries, as well as the rapidly expanding federal and military aero- and space initiatives are hampered by an absence of scientists, physicians, educators and physiologists with first-hand experience of high-performance aviation. There is especially a dearth of physicians and scientists who have experienced both the physical challenges of aerospace aviation (hyper- and hypo- gravity, supersonic speeds, etc.) as well as subsequent outcomes. This creates a significant void in trained personnel; a void that we in the Department of Physiology & Biophysics are uniquely poised to fill.

Stakeholders/Career Opportunities

- Physician Careers
 - Civilian- Government Physician (Aerospace Medicine)
 - Aerospace Medicine Specialist Physician (Air National Guard, USAF, USN, NASA)
- Research Physiologist Careers
 - NASA Human Research Program
 - Navy Research Physiologist
- Department of Transportation--Federal Aviation Administration
 - Medical Examiner
 - Aerospace & Environmental Physiology research team
- Commercial space companies
 - Virgin Galactic Research coordinator
 - SpaceX—medical support
- Aerospace Operational Physiologist (USAF, USN)

Program Description:

The AOC in AP is available to both resident and online MSMP students who have completed their first year of core MSMP courses.

All students in the AOC in AP program must satisfy all the requirements of the MS in Medical Physiology program to earn the MSMP degree. For all MSMP students, the degree will officially be “MS in Medical Physiology” but students can indicate, and the Aerospace Physiology Administration Committee will acknowledge in all correspondence and letters of recommendation, that the student has completed an Area of Concentration in Aerospace Physiology.

Application Process for the AOC in AP program:

By the first day of August following their first year of study, MSMP students interested in the AOC in AP must:

1. Be in good academic standing; i.e. have a GPA greater than or equal to 3.0 (to earn the MSMP degree, students **must** have a final GPA in the program GREATER than 3.0);
2. Have passed the 1st year Comprehensive Examination over the two first year Medical Physiology courses;
3. Provide an excellent statement to the Director of the AOC in AP program explaining why they want to be part of this AOC. This statement should be sent to Dr. Nosek at: Thomas.Nosek@Case.edu
4. Receive a favorable recommendation from their Academic Advisor sent to Dr. Nosek.

AOC in AP Curriculum

Year 2 of the MSMP program - after completing the core physiology courses:

All students in the AOC in AP program must complete at least 12 hours of elective courses which must include:

1. Two courses chosen from the 3 Clinical Reasoning courses (PHOL 479, 492, and 493) and the 2 Physiological Basis of Disease courses (PHOL 402A and 402B)
2. **Either** the Exercise Physiology for Health and Disease (PHOL 487) course Fall semester **or** the Sleep Physiology course (PHOL 614) Spring semester.
3. The Introduction to Aerospace Physiology II course (PHOL 421) Spring semester

Students who choose to take Exercise Physiology for Health and Disease course as one of their required electives:

Fall Semester:

1. Exercise Physiology (PHOL 487) – 3 credit hours
2. Choose one course from Clinical Reasoning I (PHOL 479) or Physiological Basis of Disease I (PHOL 402A) – 3 credit hours

Spring Semester:

1. Choose one course from Clinical Reasoning II (PHOL 492) or Physiological Basis of Disease II (PHOL 402B) – 3 credit hours

Description of the Revised AOC in AP 7/3/2023

2. Introduction to Aerospace Physiology II (PHOL 422) - 3 credit hours

Students who choose to take Sleep Physiology as one of their required electives:

Fall Semester:

1. Clinical Reasoning I (PHOL 479) and Physiological Basis of Disease I (PHOL 402A) – 3 credit hours

Spring Semester:

1. Introduction to Aerospace Physiology II (PHOL 422) – 3 credit hours
2. Sleep Physiology (PHOL 614) – 3 credit hours