THE UNIVERSITY OF NORTH CAROLINA ASHEVILLE
FACULTY SENATE

Senate Document Number SD2223S
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Statement of Faculty Senate Action:

APC Document 13 (ATMS): Change course title and course description for ATMS 305; Change course description for ATMS 455

Effective Date: Fall 2023

1. Delete: On page 94, entry for **ATMS 305, Atmospheric Thermodynamics and Statics**:

> **305 Atmospheric Thermodynamics and Statics (3)**
> A study of the gaseous composition of the earth's atmosphere, its modification by radiative processes and the application of the gas laws to the atmospheric statics. Prerequisites: ATMS 204; PHYS 221. Pre-or corequisite: MATH 192. Fall.

Add: On page 94, in place of deleted entry:

> **305 Atmospheric Thermodynamics and Hydrostatics (3)**
> The thermodynamics of atmospheric gases, with emphasis on energy conservation, energy transfer, the importance of water vapor, the equation of state, and hydrostatics and atmospheric stability. Prerequisites: ATMS 204; PHYS 221. Pre- or corequisite: MATH 192. Fall.

Impact: *Thermodynamics and Hydrostatics* remains the foundational upper-level required course for all atmospheric sciences majors. There is no change to the pre- and corequisites, the timing of the course, or the actual course content. Changes to the course title and catalog description will have no impact on current students, funding, or staffing needs.

Rationale: The first third of the ATMS 305 course covers the thermodynamics of dry air, the second third covers the thermodynamics of moist air, and the final third of the course focuses on hydrostatics and atmospheric stability. It therefore remains important to keep a mention of the latter topic in the course title. However, the current course title has bothered the instructor for many years. Statics is a branch of classical mechanics that encompasses many more subtopics than are covered in this course. Hydrostatics is a special subtopic that describes fluids (and by extension, atmospheric gases) at rest. This is a critical element of meteorology that has applications in atmospheric stability, the vertical coordinate system, the structure of weather systems, thunderstorms, cloud formation, numerical modeling, and weather forecasting, all of which are mentioned in class. The revised course title simply captures a more accurate representation of the course.

The revised course description reflects the topics covered in the course as taught by Dr. Christopher Godfrey since 2009, fixes typographical errors, and more appropriately describes the course content of a typical thermodynamics course within a modern atmospheric sciences curriculum. The details of atmospheric composition and radiative processes are instead covered more completely in ATMS 455 (*Physical Meteorology*).

All faculty in the atmospheric sciences department agree with this change.

2. **Delete:** On page 95, the course description for **ATMS 455, Physical Meteorology**:

> **455 Physical Meteorology (3)**
> Physical processes of condensation, radiation and radiative transfer, atmospheric sound and light propagation, atmospheric electrical phenomena and principals of weather modification. Prerequisite: ATMS 305. Spring.

Add: On page 95, in place of deleted entry:

> **455 Physical Meteorology (3)**
> The composition of the atmosphere, atmospheric optics, solar and terrestrial radiation and radiative transfer, cloud microphysics, meteorological acoustics, and atmospheric electricity. Prerequisite: ATMS 305. Spring.

Impact: *Physical Meteorology* remains a required course for all atmospheric sciences majors. There is no change to the prerequisite, the timing of the course, or the actual course content. Changes to the catalog description will have no impact on current students, funding, or staffing needs.

Rationale: While the current course description is a fair characterization of the course content, it fails to mention the composition of the atmosphere—a topic which constitutes 10% of the course—or the more involved topic of cloud microphysics. In addition, weather modification is discussed in the context of cloud microphysics, but is not a primary focus of the course. The revised course description appropriately reflects the main topics covered in the course as taught by Dr. Christopher Godfrey since 2008 and by Dr. Douglas Miller prior to that. The general topic of cloud microphysics encompasses atmospheric aerosols, cloud droplet growth (i.e., condensation), warm and cold cloud microphysics, and meteorological radar principles. The remaining topics in the old course description are simply reframed in the new description to match the terminology presented in the course, though "light and optics" is a specific GS-1340 occupational requirement for federal employment in the meteorology sector. The new course description will help employers to recognize more clearly the important elements of this course.

All faculty in the atmospheric sciences department agree with this change.