AMS Short Course: UAS for Atmospheric Research

This workshop will give a comprehensive view of uncrewed aircraft systems (UAS) or drones as an observation tool for atmospheric research, primarily for profiling of the atmosphere. The goals encompass system selection, sensor integration, flight operations, and data analysis. Observations will focus on kinematic (wind) and thermodynamic (pressure, temperature, humidity) but also include other observations such as imaging, particles, and chemistry. Students will be provided case studies to demonstrate system and operational design as well as sample data to consider analytical methods.

Materials provided will include presentations, analysis codes, and sample data sets.

Activity/Method	**Content Description**	**Support Materials**	**Estimated Time**
Introductions	Introductions and class goals	Handouts: Instructor contact info Participant list	15 min
Lecture	UAS as tools: past, present, and future benefits. Platform selection, COTS vs. custom platforms	Handouts: Slides	30 min
Lecture and Hands-on exercise	Thermodynamic and wind observations	Handouts: Slides url containing the codes and datasets (students can use their laptops to interact if desired)	1 hr Multiple examples during this time
Lecture and Hands-on exercise	Imaging and photogrammetry	Handouts: Slides url containing the codes and datasets (students can use their laptops to interact if desired)	45 min

Lecture and Hands-on exercise	Particle imaging and chemistry introduction	Handouts: Slides url containing the codes and datasets (students can use their laptops to interact if desired)	45 min
Course wrap-up	Review the take-away concepts that were demonstrated in case studies. Solicit feedback from the hands-on exercise. Answer any remaining questions. End course.	Handout of key concepts	15 min (30 min slack for break and extra time)