



Summer 2022 Workshop Agenda: Maine

Outcomes: Participants will be able to...

- assemble an Arduino microcontroller and sensors.
 - program an Arduino and collect data from the sensors.
 - assemble a CubeSat frame with an Arduino microcontroller.
 - integrate CubeSats onto a balloon launch platform.
 - launch, communicate with, and recover a balloon mission.
 - communicate with CubeSats on suborbital and orbital missions.
 - collect, present, and disseminate data collected from CubeSat missions.
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Day 0 - 8/14 - Sun - Meet & Greet Flight Deck Brewing 5:00 pm

Day 1 - 8/15 - Mon - Microcontrollers & Sensors

Breakfast	8:30 am
TIS & Partner Introductions	9:00 am
Intro to Working with Arduino	9:15 am
• Arduino IDE	15 min.
• Arduino Board Parts	15 min.
• Breadboard & Connections	15 min.
Arduino Programming Language	10:00 am
• LED Wiring & Programming	15 min.
• Arduino Libraries & where to find them	15 min.
Sensor Install & Programming	10:30 am
• Photosensor	15 min.
• Soldering Components	60 min.

Dr. Barbie Buckner, Education Specialist for NASA EPDC	11:45 am
• Building a Satellite Classroom Activity	45 min.
Lunch	12:30 pm
Dr. Barbie Buckner, Education Specialist for NASA EPDC	1:30 pm
• Building a Satellite Classroom Activity (Cont.)	45 min.
Sensor Install & Programming	2:15 pm
• UV Sensor	15 min.
Onsite Experience - bluShift Aerospace Tour	2:30 pm
Kristine Logan - Midcoast Regional Development Authority	4:00 pm
• Brunswick Landing Redevelopment	60 min.
Wrap-up	5:00 pm

Day 2 - 8/16 - Tue - Arduino & CubeSats

Breakfast	8:30 am
Sensor Install, Programming, & Soldering	9:00 am
• Temperature	30 min.
• Real-time Clock	60 min.
• Air Quality Sensor	45 min.
• Gyroscope/Accelerometer	30 min.
Dr. Barbie Buckner, Education Specialist for NASA EPDC	11:45 am
• Launching a Satellite Classroom Activity	45 min.
Lunch	12:30 pm
Dr. Barbie Buckner, Education Specialist for NASA EPDC	1:30 pm
• Launching a Satellite Classroom Activity (Cont.)	45 min.
Sensor Install, Programming & Soldering	2:15 pm
• SD Storage Expansion	15 min.
• Heart Rate Monitor	45 min.
• Cube Frame Build	45 min.
Hasshi Sudler - Villanova University	4:00 pm
• Blockchain in Space	60 min.
Wrap-up	5:00 pm

Day 3 - 8/17 - Wed - Airplane Rides/CubeSat Integration

Breakfast	7:45 am
• Airplane Rides	8:00 am
• AOPA Presentation	
Lunch	TBD

Arduino & Sensors Wrap-up	1:30 pm
Anne Chinnery - Firefly Aerospace	2:00 pm
Experimental Development in the Classroom	3:00 pm
• CubeSats in the classroom brainstorm	60 min.
Integrating CubeSats onto Balloon Launches	4:00 pm
• Planning	15 min.
• Payload	15 min.
• Launch	15 min.
• Tracking & Recovery	15 min.
Wrap-up	5:00 pm

Day 4 - 8/18 - Thu - Balloon Mission

Balloon Mission	TBD
Lunch	TBD

Day 5 - 8/19 - Fri - Balloon Data/Satellite Communication

Breakfast	8:30 am
Licensing Orbital Satellites	9:00 am
Satellite Communications	9:15 am
• Basic Radio Communications	30 min.
• APRS & Ground Stations	15 min.
• Celestial Mechanics	20 min.
• Satellite ID & Tracking	20 min.
• Factors Affecting Communication	20 min.
• Building a Simple Ground Receiver	60 min.
Lunch	12:00 pm
Satellite Communications	1:00 pm
• Communicating with ISS	10 min.
• Serenity Satellite	30 min.
• Working with Data from Satellites	20 min.
Balloon Mission Data	2:00 pm
• Retrieving Data	15 min.
• Data Formats	15 min.
• Making Sense of Data	15 min.
• Creating Visual Representations	15 min.
Commercial Space Stations & Orbital Debris Discussion	3:00 pm
Q&A/Post Surveys/Wrap Up	4:00 pm