DACUM Research Chart for Unmanned Aircraft Systems Operations Technician (UAS)

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Produced & Facilitated by
Jennifer Stevens
President & Chief Executive Officer
Virginia Advanced Study Strategies
## DACUM Research Chart for Unmanned Aircraft Systems Operations Technician (UAS)

<table>
<thead>
<tr>
<th>DUTIES</th>
<th>TASKS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Plan the UAS Operation</strong></td>
<td>A.01 Identify mission objectives</td>
</tr>
<tr>
<td><strong>B. Prepare for the UAS operation</strong></td>
<td>B.01 Charge UAS batteries</td>
</tr>
<tr>
<td><strong>C. Perform UAS Flights</strong></td>
<td>C.01 Complete preflight checklist</td>
</tr>
<tr>
<td><strong>D. Perform UAS post-flight procedures</strong></td>
<td>D.01 Conduct post-flight inspection</td>
</tr>
<tr>
<td><strong>E. Maintain the UAS</strong></td>
<td>E.01 Perform periodic inspection procedures</td>
</tr>
<tr>
<td><strong>E.14 Lubricate drive-train</strong></td>
<td>E.15 Repair/replace UAS components</td>
</tr>
<tr>
<td><strong>E. Maintain professional proficiency</strong></td>
<td>F.01 Maintain FAA certificate</td>
</tr>
</tbody>
</table>

* Denotes task is performed multiple times in various duties

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<table>
<thead>
<tr>
<th>Worker Behaviors</th>
<th>General Knowledge &amp; Skills</th>
<th>Tools/Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organized</td>
<td>Electronics</td>
<td>Sunscreen</td>
</tr>
<tr>
<td>Attention to detail</td>
<td>Battery technology</td>
<td>Truck/van</td>
</tr>
<tr>
<td>Emotional intelligence</td>
<td>Fuel technology</td>
<td>Fire extinguisher</td>
</tr>
<tr>
<td>Able to follow checklists</td>
<td>Physics</td>
<td>Mobile office</td>
</tr>
<tr>
<td>Level headed/&quot;cool and collected&quot;</td>
<td>Electrical engineering</td>
<td>Ground station</td>
</tr>
<tr>
<td>Able to handle sensitive situations</td>
<td>Voltage</td>
<td>LAANC</td>
</tr>
<tr>
<td>Problem solver</td>
<td>Current</td>
<td>UAS zone</td>
</tr>
<tr>
<td>Integrity</td>
<td>Communications</td>
<td>Wind anonometer</td>
</tr>
<tr>
<td>Safety oriented</td>
<td>FAA regulations</td>
<td>Air horn</td>
</tr>
<tr>
<td>Punctual</td>
<td>FCC regulations</td>
<td>Air radio</td>
</tr>
<tr>
<td>Proactive</td>
<td>Crew resource management</td>
<td>SD cards</td>
</tr>
<tr>
<td>Spatial awareness</td>
<td>Aeronautical decision making</td>
<td>Thumb drives</td>
</tr>
<tr>
<td>Situational awareness</td>
<td>RF communications</td>
<td>Lighting equipment</td>
</tr>
<tr>
<td>Eye/hand coordination</td>
<td>Surveying/mapping – GIS</td>
<td>Cellular/wireless hotspot</td>
</tr>
<tr>
<td>Team player</td>
<td>Airspace authorizations</td>
<td>Bucket/sand</td>
</tr>
<tr>
<td>Manage expectations</td>
<td>Privacy policies- NTIA and state</td>
<td>FPV goggles</td>
</tr>
<tr>
<td>Ambassador for company</td>
<td>State mapping laws</td>
<td>Ground control targets</td>
</tr>
<tr>
<td>Takes responsibility</td>
<td>Basic cybersecurity</td>
<td>Surveying equipment</td>
</tr>
<tr>
<td>Honest</td>
<td>Liabilities/consequences</td>
<td>Laser height gauge</td>
</tr>
<tr>
<td>Resourceful</td>
<td>Insurance requirements</td>
<td>Field cases</td>
</tr>
<tr>
<td>Project management</td>
<td>Mission planning</td>
<td>Cones</td>
</tr>
<tr>
<td>Learns from mistakes</td>
<td>Post processing data</td>
<td>Caution tape</td>
</tr>
<tr>
<td>Assertive</td>
<td>PWM</td>
<td>Vest</td>
</tr>
<tr>
<td>Leadership skills</td>
<td>General mechanical torque skills</td>
<td>Walkie talkies</td>
</tr>
<tr>
<td>Clear/concise communicator</td>
<td>Flight controllers</td>
<td>First aid kit</td>
</tr>
<tr>
<td>Understanding of security in field</td>
<td>PID control tuning</td>
<td>Monitors</td>
</tr>
<tr>
<td>Security clearance</td>
<td></td>
<td>Aeronautical charts</td>
</tr>
<tr>
<td>Able to pass background check</td>
<td></td>
<td>Land use paperwork</td>
</tr>
<tr>
<td>Initiative</td>
<td></td>
<td>Payloads</td>
</tr>
<tr>
<td>Respect for authority</td>
<td></td>
<td>Camera</td>
</tr>
<tr>
<td>Humble</td>
<td></td>
<td>Thermal camera</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LIDAR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Computer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cell phone</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fire cabinet</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fire gloves</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Spare parts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Generator</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cooler</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Table/chairs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GPS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>chairs</td>
</tr>
</tbody>
</table>

**General Knowledge & Skills cont.**

- Aircraft fundamentals
- Airspace
- Aeronautical knowledge
- GPS
- Weather
- Solder
- IT knowledge
- Cameras
- Sensors
- Resistance
- Amateur radio license
- Research land use/ownership
- Photogrammetry
- Remote sensing
- Electronics
- Battery technology
- Fuel technology
- Physics
- Electrical engineering
- Voltage
- Current
- Communications
- FAA regulations
- FCC regulations
- Crew resource management
- Aeronautical decision making
- RF communications
- Surveying/mapping – GIS
- Airspace authorizations
- Part 107
- Privacy policies– NTIA and state
- State mapping laws
- Basic cybersecurity
- Liabilities/consequences
- Insurance requirements
- Mission planning
- Post processing data
- PWM
- General mechanical torque skills
- Flight controllers
- PID control tuning

**Tools/Equipment cont.**

- UAS
- PPE
- Soldering iron
- Multimeter
- Batteries
- Chargers
- Package release mechanisms
- Spotlight
- Speaker
- Magnetometer
- Gas spectrometer
- Ag. chemicals/treatments
- Biological detection equipment
- Multispectral/hyperspectral imager
- Plotter
- 3D printer
- Mechanical tools
- Spectrum analyzer
- Sunscreen
- Truck/van
- Fire extinguisher
- Mobile office
- Ground station
- LAANC
- UAS zone
- Wind anonometer
- Air horn
- Air radio
- SD cards
- Thumb drives
- Lighting equipment
- Cellular/wireless hotspot
- Bucket/sand
- FPV goggles
- Ground control targets
- Surveying equipment
- Laser height gauge
- Field cases
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- Caution tape
- Vest
- Walkie talkies
- First aid kit
- Monitors
- Aeronautical charts
- Land use paperwork
- Payloads
- Camera
- Thermal camera
- LIDAR
- Computer
- Cell phone
- Fire cabinet
- Fire gloves
- Spare parts
- Generator
- Cooler
- Table/chairs
- GPS
- IMU
Future trends/ Concerns

Automation
Artificial intelligence
Ability to request authorization automatically
Machine learning
Detect and avoid (DAA)
Beyond/extended visual line of sight
Being pilot in command of multiple aircraft
UTM integration
Coordination with military/LAANC
Operations over people
Operations at night
Part 135/121
Privacy - public and operators- 4th amendment
RTK system on UAV
Public acceptance of use of UAS
Workforce implications - loss of jobs due to increased use of UAS
Adding new types of jobs
Issues with wireless interference - places you cannot fly UAS
Real time onboard data processing
Real time delivery of products
Inspections by UAS
More efficiency/less cost using UAS
Manned/ unmanned teaming
Cybersecurity - concern with spy equipment and protection of data
Counter UAS
Terrorist attacks/weaponization
Protection of critical infrastructure
Existence of geofences

Recommendations from the Field

Require workplace experience as part of training program
Join ASSURE (for schools to test/stay abreast of new technologies)
Higher degrees may be in mission-specific industry (not UAS)
Minimum degree/requirements
- Certificate in UAS
- 2-year degree - mission specific
- Minimum hours of flight time (25+ hours)
- Need to fly non-GPS mode comfortably
- Capstone project or portfolio