

**Addendum 6 to the 2024 Sonoran Desert Institute Catalog
Effective 10/01/2024**

Throughout the catalog – all references to unmanned technology are changed to uncrewed technology

Addendum 5 – Remove the following section

Tuition, Fees, and Completion Time by Program

The following is a listing of the current program offerings. SDI reserves the right to cancel or postpone courses or programs as necessary. Completion times may differ from agency or other funding eligibility.

Program	Credit Hours	Tuition Per Credit Hour	Education Resource Fee per Semester*	Total Program Cost	CA STRF Fee**	Expected Completion Terms ***
Associate of Science in Firearms Technology	60	\$360	\$700	\$24,400.00	\$0	4
Certificate in Firearms Technology – Gunsmithing	32	\$360	\$700	\$12,920.00	\$0	2
Certificate in Firearms Technology – Handgun Specialist	16	\$530	\$700	\$9,180.00	\$0	1
Certificate in Unmanned Technology – Aerial Systems	16	\$360	\$700	\$6,460.00	\$0	1
School of Firearms Technology Optional/Individual Courses	1-4 Varies	\$360 per credit hour	\$700	Varies	Varies	8weeks/ 4 weeks- Labs
School of Unmanned Technology Optional/Individual Courses	4	\$360 per credit hour	\$700	Varies	Varies	8 weeks

* The Associate of Science in Firearms Technology Educational Resource Fee is billed at \$700 per semester, not to exceed 4 semesters. The Certificate in Firearms Technology - Gunsmithing Educational Resource Fee is billed at \$700 per semester, not to exceed 2 semesters. The Certificate in Unmanned Technology - Aerial Systems and Certificate in Firearms Technology - Handgun Specialist Educational Resource Fee is billed at \$700 per semester, not to exceed one semester.

** California law mandates the collection of a Student Tuition Recovery Fund (STRF) fee: \$0 per \$1,000 of institutional charges. Only California residents were required previously to pay the fee. See California Students Only section for more information.

***Students may complete the program in less time based on year-round enrollment opportunities. Part-time students may take longer to complete.

Replace with

Tuition, Fees, and Completion Time by Program

The following is a listing of the current program offerings. SDI reserves the right to cancel or postpone courses or programs as necessary. Completion times may differ from agency or other funding eligibility.

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Associate of Science in Firearms Technology	60	\$360	\$700	\$24,400.00	\$0	4
Associate of Science in Uncrewed Technology	60	\$360	\$700	\$24,400.00	\$0	4
Certificate in Firearms Technology – Gunsmithing	32	\$360	\$700	\$12,920.00	\$0	2
Certificate in Firearms Technology – Handgun Specialist	16	\$530	\$700	\$9,180.00	\$0	1
Certificate in Uncrewed Technology – Aerial Systems	16	\$360	\$700	\$6,460.00	\$0	1
School of Firearms Technology Optional/Individual Courses	4	\$360	\$700	Varies	Varies	Varies

* The Associate of Science in Firearms Technology and the Associate of Science in Uncrewed Technology Educational Resource Fee is billed at \$700 per semester, not to exceed 4 semesters. The Certificate in Firearms Technology - Gunsmithing Educational Resource Fee is billed at \$700 per semester, not to exceed 2 semesters. The Certificate in Uncrewed Technology - Aerial Systems and Certificate in Firearms Technology - Handgun Specialist Educational Resource Fee is billed at \$700 per semester, not to exceed one semester.

** California law mandates the collection of a Student Tuition Recovery Fund (STRF) fee: \$0 per \$1,000 of institutional charges. Only California residents were required previously to pay the fee. See California Students Only section for more information.

***Students may complete the program in less time based on year-round enrollment opportunities. Part-time students may take longer to complete.

Catalog Page 73 – Add the following pages between current catalog pages 72 and 73

Uncrewed Technology Programs

Currently, Sonoran Desert Institute offers an Associate of Science in Uncrewed Technology degree and a Certificate in Uncrewed Technology – Aerial Systems.

ASSOCIATE OF SCIENCE IN UNCREWED TECHNOLOGY

The Associate of Science in Uncrewed Technology degree program provides the student with a thorough understanding of concepts focusing on operating, maintaining, and managing small uncrewed aircraft systems (sUAS). This associate program has a strong focus on uncrewed systems supported by basic general education courses. This is a four-semester program consisting of 60 semester credit hours of college-level study. There are 15 general education credits, 32 discipline specific credits, 12 discipline specific elective credits, and one student success credit. Students study historical, technical, and operational knowledge of uncrewed aircraft systems and technology.

Program Specific Admissions Requirements

For SDI Uncrewed Technology programs and courses, the following requirements are in place:

- Students will need access to a legal and safe space to fly drones to complete assignments in some of the coursework.
- The FAA requires drone pilots to be in a physical and mental condition that allows them to safely fly a drone. This involves being physically capable of operating the drone controls and mentally alert to handle any situations that may arise during flight.

Graduate Employment Opportunities

Some of the many areas within the Uncrewed and Autonomous Aircraft Industry where a student may apply the knowledge gained from the Certificate in Uncrewed Technology at the entry-level include:

- Project Manager
- Systems Engineering Management Apprentice
- UAS Assistant Manager
- UAS Aviation Management Apprentice
- UAS Technician
- UAS Technologist
- UAS Remote Pilot

The Classification for Instructional Programs (CIP) associated with this program is 15.0407, titled “Mechatronics, Robotics, and Automation Engineering Technology/Technician.”. The Standard Occupation Classification (SOC) 17-3024.00, Electro-Mechanical and Mechatronics Technologists and Technicians and 17-3024.01, Robotics Technicians. Sonoran Desert Institute does not guarantee job placement or employment.

Tools and Equipment

Tools and equipment are provided by the Institute and included in the total program cost. These items are shipped to the student with other learning materials and will belong to the student. Students need to have access to a safe, legal space to fly for certain courses and may need additional supplies to complete certain projects. Please visit the following link www.sdi.edu/current-students/lab-tools/ for a comprehensive list of supplies required for completion of assignments, per current course offerings.

Completion Requirements

To earn an Associate of Science in Uncrewed Technology degree, a student must do the following:

- Successfully Complete all coursework required in the degree program
- Complete at least 44 credit hours of discipline-specific coursework
- Complete at least 15 credit hours of general education coursework
- Complete at least one credit hour of student success coursework
- Complete the program with a minimum grade point of 2.0 or above

Program Outcomes

With the successful completion of this program, a student will be able to do the following:

- Describe the knowledge, skills, and practical experience necessary to contribute to UAS operations in roles such as remote pilots, sensor operators, technicians, data analysts, mission planners, or program/project managers.
- Demonstrate proficiency in operating, maintaining, and troubleshooting uncrewed aircraft systems.
- Discuss important system elements of UAS technology, including airframes, flight controls, propulsion, sensors, and communication systems.
- Explain the multidisciplinary nature of UAS technology with respect to regulations, aviation principles, aeronautics, electronics, remote sensing, wireless communications, data analysis, and computer science, enabling them to approach UAS operations from a comprehensive perspective.

- Plan UAS missions to collect data for post-flight analysis.
- Analyze UAS mission data using industry-standard tools/software to make informed recommendations or decisions.
- Demonstrate professional integrity and ethical conduct in all UAS-related work and explain federal regulations, industry standards, and ethical guidelines for UAS operations in the U.S. National Air Space.
- Use effective verbal and written communication skills to clearly and concisely articulate technical concepts to supervisors, team members, stakeholders, and customers and compose well-written findings, recommendations, and reports.
- Demonstrate a safety focus to identify and assess potential risks, implement appropriate safety protocols, and effectively manage risks associated with all UAS operations.
- Explain aviation authorities' legal requirements and guidelines and apply their knowledge to design compliant missions for legal operations throughout the United States.
- Practice problem-solving and critical-thinking skills to analyze operational scenarios, identify issues, and devise solutions for UAS operations; Demonstrate adaptability to unexpected challenges, including making justifiable decisions during real-time scenarios.
- Advocate “Drones are Good” concepts and defend the industry's safe, legal, ethical, and responsible use of UAS.

Required Courses – Associate of Science in Uncrewed Technology

CATEGORY	COURSE	CREDIT HOURS	LENGTH IN WEEKS
Student Success	SDI 101: Success in Distance Learning	1	5
	Total Student Success	1	
Uncrewed Technology	UAS 101: UAS Fundamentals*	4	5
	UAS 201: sUAS Sensors and Remote Sensing	4	5
	UAS 213: sUAS Design, Build, and Fly	4	5
	UAS 231: UAS Flight Test and Evaluation	4	5
	UAS 234: sUAS Thermography Level 1	4	5
	UAS 250: FAA sUAS Professional Remote Pilot	4	5
	UET 102: Fundamentals of Electronics	4	5
	SYS 212: Project Management for UAS Engineering and Technology	4	5
	Total Uncrewed Technology Discipline Specific	32	
	UAS 202: UAS Aviation Management	4	5
	UAS 205: Introduction to Geographical Information Systems	4	5
	SYS 201: UAS Systems Engineering Management	4	5
	Total Uncrewed Discipline Specific Electives	12	
General Education	Arts and Humanities	3	5
	Communication Arts	3	5
	Mathematics	3	5
	Natural and Physical Sciences	3	5
	Social and Behavioral Sciences	3	5
	Total General Education	15	
TOTAL PROGRAM SEMESTER CREDIT HOURS		60	80

*UAS 101 is a prerequisite to all other discipline-specific courses in the Associate of Science in Uncrewed Technology Degree.

CERTIFICATE IN UNCREWED TECHNOLOGY – AERIAL SYSTEMS

Program Summary

The Certificate in Uncrewed Technology - Aerial Systems program provides students with a solid foundation of historical, technical, and operational knowledge about uncrewed aircraft systems. Students learn how uncrewed aircraft systems are used by commercial businesses to make their operations more efficient, cost effective, and safe.

Program Specific Admissions Requirements

For SDI Uncrewed Technology programs and courses, the following requirements are in place:

- Students will need access to a legal and safe space to fly drones to complete assignments in some of the coursework.
- The FAA requires drone pilots to be in a physical and mental condition that allows them to safely fly a drone. This involves being physically capable of operating the drone controls and mentally alert to handle any situations that may arise during flight.

Graduate Employment Opportunities

Some of the many areas within the Uncrewed and Autonomous Aircraft Industry where a student may apply the knowledge gained from the Certificate in Uncrewed Technology at the entry-level include:

- Project Manager
- Systems Engineering Management Apprentice
- UAS Assistant Manager
- UAS Aviation Management Apprentice
- UAS Technician
- UAS Technologist

CIP/SOC Classifications & Summary

The Classification for Instructional Programs (CIP) associated with this program is 15.0407, titled Mechatronics, Robotics, and Automation Engineering Technology/Technician. The Standard Occupational Classifications (SOCs) are 17-3024.00, Electro-Mechanical and Mechatronics Technologists and Technicians and 17-3024.01, Robotics Technicians.

Tools & Equipment

Tools and Equipment are provided by the Institute and included in the total program cost. These items are shipped to the student with other learning materials, where applicable, and will belong to the student. Students need to have access to a drone for certain courses. Please visit the following link <https://sdi.edu/sdi-lab-tools-list> for a comprehensive list of supplies required for completion of assignments, per current course offerings.

Completion Requirements

To earn a Certificate in Uncrewed Technology – Aerial Systems, a student must:

- Complete all coursework required in the certificate program
- Complete 16 credit hours of major coursework
- Complete the program with a minimum grade point average of 2.0 or above

Program Outcomes

Upon successful completion of this certificate program, students will be prepared to:

- Describe the knowledge, skills and practical experience necessary to contribute to UAS operations in roles such as remote pilots, sensor operators, technicians, data analysts, mission planners or program/project managers.
- Demonstrate proficiency in operating, maintaining, and troubleshooting uncrewed aircraft systems.
- Discuss important system elements of UAS technology, including airframes, flight controls, propulsion, sensors, and communication systems.
- Explain the multidisciplinary nature of UAS technology with respect to regulations, aviation principles, aeronautics, electronics, remote sensing, wireless communications, data analysis, and computer science, enabling them to approach UAS operations from a comprehensive perspective.
- Demonstrate professional integrity and ethical conduct in all UAS-related work and explain federal regulations, industry standards, and ethical guidelines for UAS operations in the U.S. National Air Space.
- Use effective verbal and written communication skills to clearly and concisely articulate technical concepts to supervisors, team members, stakeholders, and customers and compose well-written findings, recommendations and reports.

- Demonstrate a safety focus to identify and assess potential risks, implement appropriate safety protocols, and effectively manage risks associated with all UAS operations.

Required Courses - Certificate in Uncrewed Technology – Aerial Systems

CATEGORY	COURSE	CREDIT HOURS	LENGTH IN WEEKS
Uncrewed Technology Discipline	UAS 101: UAS Fundamentals*	4	5
	UAS 201: sUAS Sensors and Remote Sensing	4	5
	UAS 202: UAS Aviation Management	4	5
	UAS 250: FAA sUAS Professional Remote Pilot	4	5
	Total Uncrewed Technology - Aerial Systems	16	
TOTAL PROGRAM SEMESTER CREDIT HOURS		16	

*UAS 101 is a prerequisite to all other UAS courses in the Certificate in Uncrewed Technology – Aerial Systems.

COURSE DESCRIPTIONS – SCHOOL OF UNCREWED TECHNOLOGY

Course availability may vary each semester. Not all courses may be offered each term.

UAS 101: UAS Fundamentals

4 Credit Hours

This first course in uncrewed aircraft systems introduces the history and evolution of the uncrewed aerial vehicle (UAV). The course provides a technical introduction to the subsystems of an uncrewed aerial system (UAS) to include the aircraft, payload, propulsion, navigation, wireless communications and control, autonomy, ground control station, and support systems/equipment. The topics of man-machine interface, system design, FAA regulations and UAS operations in the national airspace are also introduced. Students are introduced to how uncrewed aircraft systems are used in the commercial/civil, public service, and military sectors.

UAS 201: sUAS Sensors and Remote Sensing

4 Credit Hours

This course provides a comprehensive exploration of remote sensing technologies and sUAS sensors. Students learn the principles, applications, and practical skills necessary to capture remotely sensed data using a small, uncrewed aircraft system (sUAS) and how to analyze that data. Students will learn about the different types of remote sensors used in the uncrewed industry and how these sensors operate. Students learn how to evaluate remote sensing scenarios and how to choose a suitable sensor for the mission. By the end of this course, students have a solid foundation in aerial sensors and remote sensing and are prepared to apply this knowledge in real-world scenarios.

Prerequisite: UAS 101.

UAS 202: UAS Aviation Management

4 Credit Hours

This course provides the student with a comprehensive knowledge of a professional aviation organization model with special focus on the key pillars of safety, operations, maintenance, and culture in the context of the current regulations and specific requirements to operate an UAS in the national airspace for commercial use. UAS operations, operational risk management, aeronautical decision making, training, scheduling, standardization/evaluation (STANEVAL), maintenance, remote pilot in command responsibilities, and key federal regulations and guidance for flying commercially in the national airspace.

Prerequisite: UAS 101.

UAS 205: Introduction to Geographical Information Systems

4 Credit Hours

This course will provide students with the necessary knowledge and skills to conduct flight operations using a UAV for Geographical Information System (GIS) data collection, post-processing, and analysis of the collected data using appropriate software tools. The student will complete the course to understand the full process for using UAVs as a tool for collecting and then post-processing the collected data.

Prerequisite: UAS 101.

UAS 213: sUAS Design, Build, and Fly

4 Credit Hours

This course will introduce the students to building, assembling, powering, and configuring components of a small uncrewed aircraft system into an aircraft that will be capable of stable flight that students can use for this and future classes. This course will detail the assembly requirements of each component and subsystem. Once assembly is completed the aircraft will be powered on and sensors and autopilot configured as required to ensure stable flight. Students will gain additional skills such as soldering, hardware assembly, ground control station software basics, and telemetry setup. *Prerequisite: UAS 101.*

UAS 231: UAS Flight Test and Evaluation

4 Credit Hours

This course provides an introduction into how Uncrewed Aircraft Systems (UAS) are flight tested and their performance is evaluated. This course provides students with the background and knowledge to understand the fundamental principles of flight test engineering. The topics covered include Introduction to Flight Test Engineering, Test and Evaluation Fundamentals, UAS Test Management, UAS Performance Testing, UAS Flying and Handling Qualities Testing, and UAS Systems Testing.

Prerequisite: UAS 101.

UAS 234: sUAS Thermography Level 1

4 Credit Hours

This is an introductory thermography course with infrared and heat transfer science training. This course is focused on how aerial inspections and thermal scans using sUAS infrared cameras can support several industries to be safer, more efficient, and more effective. The course provides students with the theory and science of infrared radiation and how infrared measurements are used to determine thermal patterns. The course covers the theoretical background, knowledge, and skills to properly capture, tune, and interpret thermal images collected from an sUAS platform and infrared sensor. Students learn to select the proper camera and

lens combinations for their application's needs. Students are provided with a handheld infrared camera to conduct practical assignments and experiments that reinforce the concepts learned during the course. This infrared camera is theirs to keep and use after the course. After successfully completing this course, students have the knowledge, skill, and ability to enter the workforce as entry-level and/or apprentice thermographers.

Prerequisites: UAS 101 and UAS 201.

UAS 250: FAA sUAS Professional Remote Pilot

4 Credit Hours

This course provides students with a comprehensive education in the knowledge areas covered by the Remote Pilot sUAS Airman Certification standards. Students learn to fly drones and develop safe flying skills in a state-of-the-art drone flight simulator and hands on application. The course presents instruction on the components of a modern multi-rotor drone, fundamentals of flight, navigation, communication, sensors, human factors, and risk management. The course includes a comprehensive overview of the U.S. National Air Traffic Control System using 3D animations and describes how it affects remote pilots and drone operations. This course provides comprehensive review of subjects included in the FAA Remote Pilot sUAS Airman Certification Exam. After completing the course, the student may seek to attempt the FAA exam which is administered at an FAA exam center.

Prerequisite: UAS 101.

UET 102: Fundamentals of Electronics

4 Credit Hours

This course introduces students to the basic electronics knowledge that they will need to understand for Uncrewed Aircraft Systems (UAS). This is an introductory course with hands-on elements and simulation of electronic circuits used in robotics. Topics include Ohm's Law and theorems used in electrical circuits for batteries, switches, wiring, resistors, capacitors, inductors, semiconductors, and an introduction to microcontrollers. Students will also be conducting circuit builds with the Arduino microcontroller as a practical portion of the class. *Prerequisite: UAS 101*

SYS 201: UAS Systems Engineering Management

4 Credit Hours

This course introduces students to systems thinking and concepts. Students learn what comprises a system and study systems engineering management principles used to develop new systems. The course examines case studies related to UAS ethical considerations to facilitate student understanding of and appreciation for public and private concerns with uncrewed aircraft systems. *Prerequisite: UAS 101.*

SYS 212: Project Management for UAS Engineering and Technology

4 Credit Hours

The Project Management for UAS Engineering and Technology course explores project management theory and best practices that can be used in the uncrewed and autonomous aircraft systems industry. Students learn the elements required to develop general and technical projects. The course discusses the five phases of project management and how each phase is utilized in the official project plan. *Prerequisite: UAS 101.*

COURSE DESCRIPTIONS – STUDENT SUCCESS

SDI 101: Success in Distance Learning

1 Credit Hour

This course is designed to equip SDI students with the essential skills and strategies needed to succeed in a distance learning environment. The primary purpose of the course is to empower students to navigate the challenges and leverage the opportunities presented by online education, specifically within the SDI virtual classroom. Included in this course are topics on business productivity applications, learning management system use, academic integrity, student support applications, and exposure to other distance learning resources.

COURSE DESCRIPTIONS – GENERAL EDUCATION

ARTS AND HUMANITIES

AGT 100: American Government

3 Credit Hours

This course introduces students to the fundamentals of American government and politics, focusing on the historical evolution of government and policies, and the major institutions and processes. Course goals include developing an interest in and understanding of today's government, policy development, and politics, as well as developing critical thinking and information literacy skills in the areas of government and politics. Topics include the Constitution; federalism; civil rights and liberties; the structure and processes of the three branches of government; political socialization; interest groups and public opinion; political parties and the election process; and basic U.S. social, economic, and foreign policy. Students will examine institutional structures and how they interact with each other to explain the processes of government and how the historical development of the United States has affected the contemporary political environment. Instruction includes an analysis of the formal and

informal processes by which public policy is made; how individual actors impact the contemporary political environment; and application of informational literacy skills in the study of politics.

COMMUNICATION ARTS

ENG 101: English Composition I

3 Credit Hours

This course develops written communication skills with an emphasis on understanding the writing process, analyzing text, and practicing writing for personal and professional applications. Students will learn to implement the steps of the writing process; identify essay components; and write effective and grammatically correct paragraphs and essays. Instruction includes how to analyze the role of reading and writing in academic and professional careers; apply strategies to achieve clarity and effective style in writing; differentiate between writing patterns; identify sentence types and parts of speech; discriminate between proper and improper use of punctuation; and to implement correct spelling. The student will also examine and then apply strategies and guidelines for writing an effective research paper.

MATHEMATICS

MAT 101: Mathematics for Technical Trades

3 Credit Hours

This course applies math fundamentals to technical applications. Topics include a basic math review, geometric principles including angles, lines, and shapes, understanding basic algebraic concepts as applied to real-world problems, and trigonometric functions applied to angles and distances. Students will learn to solve mathematical problems; apply mathematical concepts to various technical and industry-based problems; and analyze mechanical problems using mathematical equations.

NATURAL and PHYSICAL SCIENCE

SCI 101: Introduction to Physical Science

3 Credit Hours

This course introduces students to the foundational ideas and concepts of physical science to gain a better understanding of the world. Topics covered include measurement, motion, force and motion, atomic and nuclear physics, elements of chemistry, work and energy, temperature and heat, and waves and optics. Direct application of some of these topics will be made to provide students with further context and real-world application.

SOCIAL AND BEHAVIORAL SCIENCES

PSY 101: Introduction to Psychology

3 Credit Hours

This course is designed to give students a broad overview of some of the perspectives from which psychologists try to understand and predict human experience, thought, and behavior. Students will actively analyze and explore fundamental principles of psychology in the context of their lives, careers, and academic pursuits. Topics for the course include the development of psychology as a science; learning, memory, and cognition, personality and social dimensions of psychology, and the relationship between physical and mental health.