Aviation Technology
Mississippi Curriculum Framework

Air Traffic Control (Program CIP: 49.0105 – Air Traffic Controller)
Airport Operations (Program CIP: 49.0104 – Aviation/Airway Management and Operations)
Aviation Security (Program CIP: 43.0301 – Homeland Security)
Unmanned Aerial Systems (Program CIP: 49.0101 Aeronautics/Aviation/Aerospace Science and Technology, General)

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ADOPTION OF NATIONAL STANDARDS

Due to the nature of this program, adoption of national standards is not possible. However, the following standards were used as a framework and guide when developing the curriculum.

Federal Aviation Regulations   (Part 61, 65, 91, 141, 139)
        https://www.faa.gov/regulations_policies/faa_regulations/

FAA Compliance Manual (Related Components)
        http://www.faa.gov/airports/resources/publications/orders/compliance_5190_6/

International Civil Aviation Organization (ICAO) Part 14, 17, and Airport Operations
        http://www.icao.int/Pages/default.aspx

National Fire Protection Association 407
        http://www.nfpa.org/codes-and-standards/document-information-pages?mode=code&code=407

INDUSTRY JOB PROJECTION DATA

Aviation technology occupations require an education level of short-term, moderate-term and long-term on the job training. There is 5% increase in occupational demand at the regional level and a 19.51% increase at the state level. Median annual income for workers is $48,165.87 at the state level and $54,984.80 at the regional level. A summary of occupational data from the State Workforce Investment Board Data Center is displayed below:

Table 1:   Education Level

Program Occupations	Education Level
Air Traffic Controllers	Long-Term on-the-job training
Airfield Operations Specialists	Long-Term on-the-job training

Table 2:   Occupational Overview

	Region	State	United States
2010 Occupational Jobs	20	41	30410
2020 Occupational Jobs	21	49	34281
Total Change	1	8	3871
Total % Change	5.00%	19.51%	12.73%
2010 Median Hourly Earnings	$26.44	$23.16	$31.76
2010 Median Annual Earnings	$54,984.80	$48,165.87	$66,060.80
Annual Openings	0	0	387

Table 3:   Occupational Breakdown

Description	2010 Jobs	2020 Jobs	Annual Openings	2010 Hourly Earnings	2010 Annual Earnings 2,080 Work Hours
Air traffic controllers	<10	<10	0	$36.27	$75,441.60
Airfield operations specialists	16	17	0	$16.60	$34,528.00

Table 4:   Occupational Change

Description	Regional Change	Regional % Change	State % Change	National % Change
Air traffic controllers	0	0.00%	27.27%	11.73%
Airfield operations specialists	1	6.25%	16.67%	16.25%

ARTICULATION

Because of the nature of this postsecondary program, there are no Secondary Career Pathway programs that articulate to the Postsecondary Aviation Technology Program.

TECHNICAL SKILLS ASSESSMENT

Colleges should report the following for students who complete the program with a career certificate, technical certificate, or an Associate of Applied Science Degrees for technical skills attainment:

MS-CPAS2 Core Assessment of the following courses:

1. ANT 1113   Introduction to Aviation
2. ANT 1123   Aviation Systems
3. ANT 1213   Private Pilot Ground I
4. ANT 2113   Applied Meteorology
5. ANT 1313   Airport Management and Operations
6. ANT 1513   Aviation Security

ONLINE AND BLENDED LEARNING OPPORTUNITIES

Course content included lecture and laboratory semester credit hours. Faculty members are encouraged to present lecture related content to students in an online or blended learning environment. Training related to online and blended learning will be available to faculty members through the MS Community College Board.

INSTRUCTIONAL STRATEGIES

Throughout the first year of implementation, instructors will develop a CANVAS course that includes instructional strategies.

ASSESSMENT STRATEGIES

Throughout the first year of implementation, instructors will develop a CANVAS course that includes assessment strategies.

CREDIT BY EXAMINATION

Each exam will serve as the state recommended exam to reward credit for prior learning experiences. Colleges have the local autonomy to create a college-level exam when awarding credit.

Course	Assessment Information
ANT 1213	Recreational Pilot and Private Pilot http://www.faa.gov/training_testing/testing/test_standards/media/FAA-S-8081-14B.pdf
ANT 2343	Airport Certified Employee – Operations of the American Association of Airport Executives (AAAE)
ANT 2513	Airport Certified Employee – Security of the American Association of Airport Executives (AAAE)

PROGRAM DESCRIPTION

The Aviation Technology program consists of a 18 semester hour core that consists of general knowledge and skill preparation that will enhance students overall knowledge of aviation technology. Additionally, the program consists of four program concentrations:
1. Air Traffic Control
2. Airport Operations
3. Aviation Security
4. Unmanned Aerial Systems

The Air Traffic Control Technology concentration prepares students for employment in air traffic control careers. There are no restrictions on age or physical condition of students entering the program. However, students desiring employment with the Federal Aviation Administration should be aware of FAA employment requirements, such as the air traffic control specialist medical examination and a 31-year-old maximum age restriction for students anticipating employment in terminal or en route options.

The Airport Operations Technology concentration prepares students for employment in airport operations, airport management, ramp service, aircraft services, airline services, flight attendant services, cargo services, and other positions within the aviation industry. The concentration provides a general knowledge of the aviation industry relating to airports. The concentration focuses on preparing the student to take the operations segment of the Airport Certified Employee (ACE) test. This test is administered by the American Association of Airport Executives to ensure that airport operators and inspectors meet industry standards

The Aviation Security Technology concentration prepares students for employment in airport security and other aviation security positions. It also prepares students for employment in the Transportation Security Administration of the U.S. Department of Homeland Security. The student obtains a general knowledge of the aviation industry relating to airports. The concentration focuses on preparing the student to take the security segment of the Airport Certified Employee (ACE) test. This test is administered by the American Association of Airport Executives to ensure that airport operators and security specialists meet industry standards.

The Unmanned Aerial Systems concentration prepares students for employment as unmanned aerial vehicle operators and coordinators. The concentration involves hands-on operation of UAV and it involves full-scale simulator software/hardware systems for operating Remotely Piloted Vehicles (RPV). It takes students from the basic stages to the advanced stages and includes launch/recovery techniques, autopilot operation, construction/repair, risk awareness, data link and sensors, and rotary aircraft. The concentration includes commercial applications such as aerial photography, agriculture, and surveying industries.

SUGGESTED COURSE SEQUENCE

Career Certificate Required Courses

Course Number	Course Name	Semester Credit Hours	SCH Breakdown			Total Clock Hours	Clock Hour Breakdown		
			Lecture	Lab	Clinical/ Internship		Lecture	Lab	Clinical/ Internship
ANT 1113	Introduction to Aviation	3	3			45	45	0	0
ANT 1123	Aviation Systems	3	3			45	45	0	
ANT 1213	Private Pilot Ground I	3	3	0		45	45	0	0
ANT 2113	Applied Meteorology	3	3	0		45	45	0	0
ANT 1313	Airport Management and Operations	3	3			45	45	0	
ANT 1513	Aviation Security	3	3			45	45	0	0
	Technical Electives	12							
	TOTAL	**30**							**0**

Technical Certificate Required Courses – Air Traffic Control Concentration

Course Number	Course Name	Semester Credit Hours	SCH Breakdown			Total Clock Hours	Clock Hour Breakdown		
			Lecture	Lab	Clinical/ Internship		Lecture	Lab	Clinical/ Internship
ANT 2133	Tower Operations and Procedures	3	2	2		60	30	30	0
ANT 2143	Radar Operations and Procedures	3	2	2		60	30	30	0
ANT 2153	Tower Applications	3	2	2		60	30	30	0
ANT 2163	Radar Applications	3	2	2		60	30	30	0
	Technical Elective	3				0	0	0	0
	TOTAL	**15**							

Technical Certificate Required Courses – Airport Operations Concentration

Course Number	Course Name	Semester Credit Hours	SCH Breakdown			Total Clock Hours	Clock Hour Breakdown		
			Lecture	Lab	Clinical/ Internship		Lecture	Lab	Clinical/ Internship
ANT 2323	Airport Safety and Inspection	3	3			45	45	0	0
ANT 2333	Air Transportation	3	3			45	45	0	0
ANT 2343	Airport Certified Employee Preparation - Operations	3	3			45	45	0	0
ANT 2923	Supervised Work Experience	3			9	135	0	0	135
	Technical Elective	3				0	0	0	0
	TOTAL	**15**							

Technical Certificate Required Courses – Aviation Security Concentration

Course Number	Course Name	Semester Credit Hours	SCH Breakdown			Total Clock Hours	Clock Hour Breakdown		
			Lecture	Lab	Clinical/ Internship		Lecture	Lab	Clinical/ Internship
ANT 2513	Aviation Security and Inspection	3	3			45	45	0	0
ANT 2553	Airport Certified Employee Preparation – Security	3	2	2		60	30	30	0
ANT 2523	Introduction to Homeland Security	3	3			45	45	0	0
ANT 2533	Intelligence Analysis and Security Management	3	3			45	45	0	0
ANT 2543	Transportation and Border Security	3	3			45	45	0	0
	TOTAL	**15**							

Technical Certificate Required Courses – Unmanned Aerial Systems Concentration

Course Number	Course Name	Semester Credit Hours	SCH Breakdown			Total Clock Hours	Clock Hour Breakdown		
			Lecture	Lab	Clinical/ Internship		Lecture	Lab	Clinical/ Internship
ANT 2613	Basic Flight Skill Development – UAS	3	2	2		60	30	30	0
ANT 2623	Intermediate Flight Skill Development – UAS	3	2	2		60	30	30	0
ANT 2633	Advanced Flight Skill Development – UAS	3	2	2		60	30	30	0
ANT 2643	Autonomous Systems – UAS	3	2	2		60	30	30	0
	Technical Elective	3				0	0	0	0
	TOTAL	**15**							

General Education Core Courses

To receive the Associate of Applied Science Degree, a student must complete all of the required coursework found in the Career Certificate option, Technical Certificate option and a minimum of 15 semester hours of General Education Core. The courses in the General Education Core may be spaced out over the entire length of the program so that students complete some academic and Career Technical courses each semester.   Or, they may be completed within the last semester. Each community college will specify the actual courses that are required to meet the General Education Core Requirements for the Associate of Applied Science Degree at their college. The Southern Association of Colleges and Schools (SACS) Commission on Colleges Standard 2.7.3 from the Principles of Accreditation: Foundations for Quality Enhancement[1] describes the general education core.

[1]

Section 2.7.3   In each undergraduate degree program, the institution requires the successful completion of a general education component at the collegiate level that (1) is substantial component of each undergraduate degree, (2) ensures breadth of knowledge, and (3) is based on a coherent rationale. For degree completion in associate programs, the component constitutes a minimum of 15 semester hours or the equivalent. These credit hours are to be drawn from and include at least one course from the following areas: humanities/fine arts, social/behavioral sciences, and natural science/mathematics. The courses do not narrowly focus on those skills, techniques, and procedures specific to a particular occupation or profession.

Technical Electives

Course Number	Course Name	Semester Credit Hours	SCH Breakdown			Total Clock Hours	Clock Hour Breakdown		
			Lecture	Lab	Clinical/ Internship		Lecture	Lab	Clinical/ Internship
ANT 2713	Fixed Wing Airframe Setup and Maintenance – UAS	3	2	2		60	30	30	0
ANT 2723	Rotary Airframe Setup and Maintenance – UAS	3	2	2		60	30	30	0
ANT 2853	Linux Essentials - UAS	3	3	0		45	45	0	0
ANT 2863	Linux System Administration I - UAS	3	3	0		45	45	0	
ANT 2873	Linux System Administration II - UAS	3	3	0		45	45	0	
ANT 2813	Commercial Applications I – UAS	3	2	2		60	30	30	0
ANT 2823	Commercial Applications II – UAS	3	2	2		60	30	30	0
ANT 2911	Special Problems in Aviation Technology	1		2		30	0	30	0
ANT 2912	Special Problems in Aviation Technology	2		4		60	0	60	0
ANT 2913	Special Problems in Aviation Technology	3		6		90	0	90	0
ANT 2914	Special Problems in Aviation Technology	4		8		120	0	120	180
ANT 2915	Special Problems in Aviation Technology	5		10		150	0	150	225
ANT 2916	Special Problems in Aviation Technology	6		12		180	0	180	270
ANT 2921	Supervised Work Experience	1			3	45	0	0	45
ANT 2922	Supervised Work Experience	2			6	90	0	0	90

Southern Association of Colleges and Schools Commission on Colleges. (2012). *The principles of accreditation: Foundations for quality enhancement*. Retrieved from http://www.sacscoc.org/pdf/2012PrinciplesOfAcreditation.pdf

ANT 2923	Supervised Work Experience	3			9	135	0	0	135
ANT 2924	Supervised Work Experience	4			12	180	0	0	180
ANT 2925	Supervised Work Experience	5			15	225	0	0	225
ANT 2926	Supervised Work Experience	6			18	270	0	0	270
AVM 2213	Human Factors	3	3			45	45	0	0
AVM 2313	Aircraft Engine Operations	3	3			45	45	0	0
AVM 2413	Private Pilot Flight I	3	3			45	45	0	0
AVM 2423	Private Pilot Flight II	3	3			45	45	0	0
	Other Instructor Approved Electives								

CAREER CERTIFICATE REQUIRED COURSES

Course Number and Name: ANT 1113   **Introduction to Aviation**

Classification: Career Certificate Core Requirement

Description: The development of aviation from early attempts of flight to space travel, including career opportunities in the aviation industry. This course includes a brief survey of the National Airspace System, the airport environment, and the air traffic control environment.

Hour Breakdown:

Scheduled Hours	Lecture	Lab	Clock Hours
3	3	0	45

National Assessment: Not Applicable

Prerequisite: None

Student Learning Outcomes:

1. Define the aviation environment and the air traffic control environment.

2. Investigate career opportunities as it relates to aviation technology.

3. Describe the history and development of the National Airspace System (NAS).

4. Describe the airport environment.

5. Become oriented with the various navigation systems including ground and satellite based systems.

6. Discuss the basics of aviation communications.

7. Identify aircraft recognition factors (single engine, multi-engine, transport, etc.).

Course Number and Name: **ANT 1123**   **Aviation Systems**

Classification: Career Certificate Core Requirement

Description: This course is a study of the structure of the aviation system and its functions, including familiarity with the language of air traffic control, the operating principles of navigational equipment, and the federal rules affecting the movement of aircraft.

Hour Breakdown:

Scheduled Hours	Lecture	Lab	Clock Hours
3	3	0	45

National Assessment: Not Applicable

Prerequisite/Co-Requisite: ANT 1113 – Introduction to Aviation _or_ Instructor Approval

Student Learning Outcomes:

1.   Identify and discuss systems within the aviation industry including the aviation traffic control system (ATC) and the National Airspace System (NAS).

2.   Discuss orders, manuals, standard operating practices and the Federal Aviation Regulations (FARs).

3.   Interpret airspace and aviation charting within the NAS.

4.   Describe the principles of flight and the pilot's environment.

5.   Synthesize the critical phases of flight including the approach to landing.

6.   Understand and identify the role of the various components of the aviation system that include, but is not limited to:
    a.   Aviation Terminology
    b.   Aircraft Types (single engine, multi-engine, transport, etc.)
    c.   Air Space
    d.   Charting
    e.   Communication System
    f.   Security
    g.   Landing

Course Number and Name: ANT 1213   **Private Pilot Ground I**

Classification: Career Certificate Core Requirement

Description: This course includes principles of flight; the flight environment; aircraft systems; and, performance.

Hour Breakdown:

Scheduled Hours	Lecture	Lab	Clock Hours
3	3	0	45

National Assessment: Not Applicable

Prerequisite: Instructor Approved

Student Learning Outcomes:

1.   Comprehend and demonstrate understanding of:
    a.   Airplane systems
    b.   Power plants and related systems
    c.   Flight instrument
    d.   Four forces of flight and the aerodynamics of flight
    e.   Airports, aeronautical charts, and airspace
    f.   Radar and ATC services, radio procedures, and sources of flight information

Course Number and Name: **ANT 2113**   **Applied Meteorology**

Classification: Career Certificate Core Requirement

Description: Basic weather theory and information services available, including how to interpret various reports and forecasts provided by the National Weather Service and the Federal Aviation Administration.

Hour Breakdown:

Scheduled Hours	Lecture	Lab	Clock Hours
3	3	0	45

National Assessment: Not Applicable

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Demonstrate knowledge and an understanding of:
   a. Basic weather theory including air masses and weather patterns.
   b. Hazardous weather conditions and its effects on aviation.
   c. Weather data, including routine weather reports and forecasts.
   d. Controller responsibilities regarding the presentation of current weather conditions.
   e. Techniques for providing weather information to the flying public.

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Course Number and Name: ANT 1313 **Airport Management and Operations**

Classification: Career Certificate Core Requirement

Description: Examines the administration of public airports and their relationship with airlines, fixed-base operators, and the FAA. Federal airport standards for security, fuel handling and storage, noise abatement, bird control, clear zones, lighting, and federal and state financial aid programs to airports for improvements and upgrades.

Hour Breakdown:

Scheduled Hours	Lecture	Lab	Clock Hours
3	3	0	45

National Assessment: Not Applicable

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Identify general structure and discuss the components of:
   a. Commercial airports
   b. General aviation airports

2. Describe airport operations management under 14 CFR Part 139.

3. Explain components of the airport terminal design.

4. Explain airport security requirements and relationships with federal agencies.

5. Discuss airport planning, capacity, and delays.

Course Number and Name: **ANT 1513   Aviation Security**

Classification: Career Certificate Core Requirement

Description: This course is a study of the security framework of commercial airports including familiarity with the process of balancing security needs with economic needs of an airport. Provides a broader view of aviation security beyond the airport.

Hour Breakdown:

Scheduled Hours	Lecture	Lab	Clock Hours
3	3	0	45

National Assessment: Not Applicable

Prerequisite: Instructor Approved

Student Learning Outcomes:

1.   Discuss the history and development of aviation security regulations.

2.   Demonstrate an understanding of:
   a.   Security measures related to aviation security
   b.   Screening process for passengers and cargo at airports
   c.   Security technology
   d.   Access controls and perimeter security

TECHNICAL CERTIFICATE COURSES – AIR TRAFFIC CONTROL TECHNOLOGY CONCENTRATION

Course Number and Name: **ANT 2133   Tower Operations and Procedures**

Classification: Air Traffic Control Technology Concentration Requirement; Technical Elective

Description: Provides an understanding of the operation of an airport control tower. The student will achieve a working knowledge of the various components of the tower and positions of operation, the phraseologies, the separation criteria, the flight data process, the equipment and the rules and procedures for each component.

Hour Breakdown:

Scheduled Hours	Lecture	Lab	Clock Hours
3	2	2	60

National Assessment: Not Applicable

Prerequisite: ANT 1123 or Instructor Approved

Student Learning Outcomes:

1.   Interpret aviation charting and identify data pertinent to airport control duties.

2.   Apply air traffic control systems and duties to pertinent airport situations.

3.   Interpret orders, manuals, standard operating practices and the FARs.

4.   Apply the principles of flight and the pilot's environment.

5.   Apply the appropriate rules regarding critical phases of flight in the airport environment.

6.   Interpret and apply procedures to aircraft and vehicle emergencies.

Course Number and Name: **ANT 2143   Radar Operations and Procedures**

Classification: Air Traffic Control Technology Concentration Requirement; Technical
                                 Elective

Description: This course provides an understanding of the operation of an approach
                                 control facility or en route control facility. The student will achieve a working
                                 knowledge of the various components of the facilities and the positions of
                                 operation, the phraseologies, and separation criteria, the flight data process,
                                 the equipment and the rules.

Hour Breakdown:

Scheduled Hours	Lecture	Lab	Clock Hours
3	2	2	60

National Assessment: Not Applicable

Prerequisite: Instructor Approved

Student Learning Outcomes:

1.   Interpret aviation charting and identify data pertinent to radar control duties.

2.   Apply air traffic control systems and duties to pertinent situations.

3.   Interpret orders, manuals, standard operating practices and the FARs.

4.   Apply the principles of flight and the pilot's environment.

5.   Apply the appropriate rules regarding critical phases of flight in the radar environment.

6.   Interpret and apply procedures to airborne aircraft in emergencies and distress.

Course Number and Name: **ANT 2153   Tower Applications**

Classification: Air Traffic Control Technology Concentration Requirement; Technical Elective

Description: This course will allow the student to apply the various facets of air traffic control that were learned in the prerequisite courses to a simulated tower environment.

Hour Breakdown:

Scheduled Hours	Lecture	Lab	Clock Hours
3	2	2	60

National Assessment: Not Applicable

Prerequisite: Instructor Approved

Student Learning Outcomes:

1.   Prioritize the separating and sequencing of airport traffic.

2.   Utilize judgment in prioritizing airport control actions, i.e., timely and appropriate.

3.   Analyze adverse and emergency situations and take timely corrective actions.

4.   Comprehend equipment capabilities and requirements.

5.   Listens effectively and applies solutions to situations.

6.   Utilize prescribed tower phraseology.

Course Number and Name: **ANT 2163**   **Radar Applications**

Classification: Air Traffic Control Technology Concentration Requirement; Technical Elective

Description: This course will allow the student to apply the various facets of air traffic control that were learned in the prerequisite courses to a simulated radar environment.

Hour Breakdown:

Scheduled Hours	Lecture	Lab	Clock Hours
3	2	2	60

National Assessment: Not Applicable

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Prioritize the separating of radar arrivals and departures.
2. Initiate, coordinate, and utilize traffic management procedures appropriately.
3. Utilize judgment in prioritizing radar control actions, i.e., timely and appropriate.
4. Analyze adverse and emergency radar situations and takes timely corrective actions.
5. Comprehend equipment capabilities and requirements.
6. Listens effectively and applies solutions to situations.
7. Utilize prescribed phraseology.

TECHNICAL CERTIFICATE COURSES – AIRPORT OPERATIONS TECHNOLOGY CONCENTRATION

Course Number and Name: **ANT 2323**   **Airport Safety and Inspection**

Classification: Airport Operations Technology Concentration Requirement; Technical Elective

Description: Provides an overview of aviation safety programs and systems including trends in aviation safety practices with emphasis on future safety enhancements. Provides a workable knowledge of the safety inspection of airports as prescribed in Federal Aviation Regulation 139.

Hour Breakdown:

Scheduled Hours	Lecture	Lab	Clock Hours
3	3	0	45

National Assessment: Not Applicable

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Identify and understand the role of each element of FAR Part 139 regulations:
   a. Aviation safety related to flight and to airports
   b. Aircraft Rescue and Fire Fighting (ARFF)
   c. The process of inspecting airports for safety of operation
   d. Airport safety requirements related to air carrier operations
   e. Federal requirements related to aircraft accidents
   f. Ground Operations
   g. Notice to Airmen (NOTAM)
   h. Training requirements and records management

Course Number and Name: **ANT 2333**   **Air Transportation**

Classification: Airport Operations Technology Concentration Requirement; Technical Elective

Description: Provides an overview of the aviation industry. Describes the economic aspects of passenger and cargo air transportation, including practices, problems, and regulations.

Hour Breakdown:

Scheduled Hours	Lecture	Lab	Clock Hours
3	3	0	45

National Assessment: Not Applicable

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Demonstrate a general knowledge of the:
   a. Aerospace industry
   b. Air transportation industry
   c. General aviation industry
   d. Air cargo industry
   e. Airline industry to include scheduling, pricing, and regulation
   f. International aviation

Course Number and Name: **ANT 2343   Airport Certified Employee Preparation - Operations**

Classification: Airport Operations Technology Concentration Requirement; Technical Elective

Description: Provides for assessment and skill enhancement for preparation for the Airport Certified Examination (ACE), the national certifying examination for Airport Operations Specialists. The ACE is administered by the American Association of Airport Executives (AAAE).

Hour Breakdown:

Scheduled Hours	Lecture	Lab	Clock Hours
3	3	0	45

National Assessment: Not Applicable

Prerequisite: Instructor Approved

Student Learning Outcomes:

1.   Discuss the characteristics of airport operations and airport safety inspections.

2.   Demonstrate the knowledge and understanding of the following:
   a.   Components of 14 CFR Part 139, Airport Certification and Inspection
   b.   Components of Advisory Circular 150/5200-18C, Airport Safety Self- Inspection
   c.   Components of an Airport Certification Manual (ACM)
   d.   Components of an Airport Emergency Plan (AEP)
   e.   Modules of the Airport Certified Employee – Operations of the American Association of Airport Executives (AAAE)

TECHNICAL CERTIFICATE COURSES – AVIATION SECURITY TECHNOLOGY CONCENTRATION

Course Number and Name: **ANT 2513   Aviation Security and Inspection**

Classification: Aviation Security Technology Concentration Requirement; Technical Elective

Description: Provides an overview of aviation security programs and systems including trends in aviation security practices with emphasis on future security enhancements. Provides a workable knowledge of the security process at airports as prescribed in Transportation Security Regulations 1542, 1544, and 1546.

Hour Breakdown:

Scheduled Hours	Lecture	Lab	Clock Hours
3	3	0	45

National Assessment: Not Applicable

Prerequisite: Instructor Approved

Student Learning Outcomes:

    1.   Demonstrate the knowledge and understanding of the following:
   a. Characteristics of aviation security and aviation security inspections
   b. Components of 49 CFR Part 1542 Transportation Security Regulations – Airport Security
   c. Components of 49 CFR Part 1544 Transportation Security Regulations – Aircraft Operator Security
   d. Components of 49 CFR Part 1546 Transportation Security Regulations – Foreign Air Carrier Security
   e. Components of an Airport Security Program (ASP)
   f. Components of ICAO Annex 17

Course Number and Name: **ANT 2553**   **Airport Certified Employee Preparation - Security**

Classification: Aviation Security Technology Concentration Requirement; Technical Elective

Description: Provides assessment and skill enhancement to prepare for the Airport Certified Examination (ACE), the national certifying examination for Airport Security. The ACE is administered by the American Association of Airport Executives (AAAE).

Hour Breakdown:

Scheduled Hours	Lecture	Lab	Clock Hours
3	2	2	60

National Assessment: Not Applicable

Prerequisite: Instructor Approved

Student Learning Outcomes:

1.   Demonstrate the knowledge and understanding of the following:
   a.   Characteristics of security and inspections.
   b.   Components of 49 CFR Part 1542 Transportation Security Regulations – Airport Security
   c.   Components of 49 CFR Part 1544 Transportation Security Regulations – Aircraft Operator Security.
   d.   Components of 49 CFR Part 1546 Transportation Security Regulations – Foreign Air Carrier Security
   e.   Modules of the AAAE Airport Certified Employee – Security

Course Number and Name: **ANT 2523**   **Introduction to Homeland Security**

Classification: Aviation Security Technology Concentration Requirement; Technical Elective

Description: Introduces students to the vocabulary and important components of Homeland Security. Explores the state, national, and international laws impacting Homeland Security. Includes an examination of the most critical threats confronting Homeland Security.

Hour Breakdown:

Scheduled Hours	Lecture	Lab	Clock Hours
3	3	0	45

National Assessment: Not Applicable

Prerequisite: Instructor Approved

Student Learning Outcomes:

1.   Discuss the history of the Department of Homeland Security.

2.   Discuss the statutory authority related to the threat to aviation.

3.   Describe the Emergency Management Reform Act.

4.   Describe the federal organizational structure related to homeland security.

5.   Describe the terrorist-related hazards.

Course Number and Name: **ANT 2533   Intelligence Analysis and Security Management**

Classification: Aviation Security Technology Concentration Requirement; Technical Elective

Description: Examines intelligence analysis and its indispensable relationship to the security management of terrorist attacks and other threats. Explores vulnerabilities of our national defense and private sectors, as well as the threats posed to these institutions by terrorists, man-made disasters, and natural disasters. Students will discuss substantive issues regarding intelligence support of Homeland Security.

Hour Breakdown:

Scheduled Hours	Lecture	Lab	Clock Hours
3	3	0	45

National Assessment: Not Applicable

Prerequisite: Instructor Approved

Student Learning Outcomes:

1.   Discuss the agencies involved in aviation safety and security.

2.   Discuss methods of intelligence flow in the United States.

3.   Discuss the process for intelligence collection.

4.   Discuss processes for analyzing intelligence.

5.   Describe covert action and counter-intelligence.

6.   Discuss accountability and civil liberties.

Course Number and Name: **ANT 2543   Transportation and Border Security**

Classification: Aviation Security Technology Concentration Requirement; Technical Elective

Description: Provides an in-depth view of modern border and transportation security. Specific topics include security for seaports, ships, aircraft, trains, trucks, pipelines, buses, etc. Focuses on the technology need to detect terrorists and their weapons as well as includes discussion on legal, economic, political, and cultural aspects of the problem.

Hour Breakdown:

Scheduled Hours	Lecture	Lab	Clock Hours
3	3	0	45

National Assessment: Not Applicable

Prerequisite: Instructor Approved

Student Learning Outcomes:

1.   Discuss legal aspects of border crossings.

2.   Discuss processes for mitigating risks of security breaches.

3.   Discuss processes for prevention and preparedness.

4.   Discuss processes for analyzing intelligence.

5.   Describe procedures for response and recovery.

TECHNICAL CERTIFICATE COURSES – UNMANNED AERIAL SYSTEMS TECHNOLOGY CONCENTRATION

Course Number and Name: **ANT 2613**   **Basic Flight Skill Development - UAS**

Classification: Unmanned Aerial Systems Technology Concentration Requirement

Description: Orientation and familiarization with Remotely Piloted Vehicle (RPV) simulator software and hardware systems to include basic flight maneuvers and flight dynamics; practical application of pilot skills of UAS micro-light aircraft including aircraft setup, tuning, troubleshooting, and testing.

Hour Breakdown:

Scheduled Hours	Lecture	Lab	Clock Hours
3	2	2	60

National Assessment: Not Applicable

Prerequisite: Instructor Approval

Student Learning Outcomes:

1. Discuss basic concepts of UAS Operations that include:
   a. Flight operations
   b. General aviation safety standards and guidelines
   c. Pre- and post-flight checklist
   d. FAA guidelines in airspace

2. Using computer based flight simulation, train on fixed wing and multi-rotor using flight simulator training.

Course Number and Name: **ANT 2623**   **Intermediate Flight Skill Development - UAS**

Classification: Unmanned Aerial Systems Technology Concentration Requirement

Description: Orientation and familiarization with full-scale aircraft simulation software and hardware systems; intermediate flight skills training to include aircraft preflight and systems check, recovery from unusual attitudes, and flight dynamics of heavily-loaded, high-performance aircraft; practical application in external flight training of basic and advanced UAS aircraft.

Hour Breakdown:

Scheduled Hours	Lecture	Lab	Clock Hours
3	2	2	60

National Assessment: Not Applicable

Prerequisite: ANT 2613 or Instructor Approval

Student Learning Outcomes:

1. Identify the differences between a multi-rotor and fixed wing simulator.

2. Demonstrate operational proficiency in using computer based multi-rotor and fixed wing _flight simulators_ using the following procedures:
   a. Taxing
   b. Flying
   c. Landing
   d. Hovering (only for multi-rotor)

3. Demonstrate operational proficiency in using computer based multi-rotor and fixed wing _aircraft_ using the following procedures:
   a. Taxing
   b. Flying
   c. Landing
   d. Hovering (only for multi-rotor)

Course Number and Name: **ANT 2633   Advanced Flight Skill Development - UAS**

Classification: Unmanned Aerial Systems Technology Concentration Requirement

Description: Advanced UAS systems overview including video and data link operation; introduction to First Person View (FPV) in basic and advanced UAS aircraft; launch/recovery techniques and UASA operations in airport environment.

Hour Breakdown:

Scheduled Hours	Lecture	Lab	Clock Hours
3	2	2	60

National Assessment: Not Applicable

Prerequisite: ANT 2623 or Instructor Approved

Student Learning Outcomes:

1. Successfully perform advanced flight maneuvering with a fixed wing and a multi-rotor aircraft (heavier, faster, higher performance aircraft).
    a. Practice obstacle and collision avoidance.
    b. Practice emergency or evasive flight maneuvering.

2. Demonstrate flight proficiency in first person view utilizing fixed wing and multi-rotor aircraft.

3. Practice and recover from unusual attitude exercises.

4. Perform corrective actions needed to resolve emergency situations.

Course Number and Name: **ANT 2643   Autonomous Systems - UAS**

Classification: Unmanned Aerial Systems Technology Concentration Requirement

Description: Introduction of autonomous systems theory including UAS autopilot operation, setup, tuning, and troubleshooting; practical application of UAS mission planning and aircraft flight testing including launch/recovery, flight following, situational awareness, Crew Resource Management, risk awareness and emergency procedures.

Hour Breakdown:

Scheduled Hours	Lecture	Lab	Clock Hours
3	2	2	60

National Assessment: Not Applicable

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Demonstrate an understanding of the components associated with the autopilot system that include, but are not limited to:
    a. GPS
    b. Compass
    c. Camera and Various Sensors
    d. Mission Planning
    e. Flight Monitoring

2. Demonstrate the ability to set-up, tune, and troubleshoot the autopilot system.

3. Demonstrate the practical application of:
    a. Autonomous mission planning
    b. Aircraft test system including launch and recovery
    c. Flight following
    d. Situational awareness
    e. Crew resource management
    f. Risk awareness
    g. Emergency procedures.

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Course Number and Name: **ANT 2713   Fixed Wing Airframe Setup and Maintenance - UAS**

Classification: Unmanned Aerial System Technology Concentration

Description: Airframe construction and repair techniques, aircraft tuning, weight/balance considerations; installation of data link, sensors, and autopilot systems.

Hour Breakdown:

Scheduled Hours	Lecture	Lab	Clock Hours
3	2	2	60

National Assessment: Not Applicable

Prerequisite: ANT 2613 or Instructor Approved

Student Learning Outcomes:

1.   Construct and repair autonomous fixed wing flight vehicles.

2.   Tune autonomous fixed wing flight vehicles.

3.   Proficiently operate autonomous fixed wing flight vehicles.

Course Number and Name: **ANT 2723   Rotary Airframe Setup and Maintenance - UAS**

Classification: Technical Elective

Description: Emphasis on rotary airframe construction and repair techniques, aircraft tuning, and weight/balance considerations; installation of data link, sensors, and autopilot systems.

Hour Breakdown:

Scheduled Hours	Lecture	Lab	Clock Hours
3	2	2	60

National Assessment: Not Applicable

Prerequisite: ANT 2613 or Instructor Approved

Student Learning Outcomes:

1.   Construct and repair autonomous rotorcraft flight vehicle.

2.   Tune autonomous rotorcraft flight vehicle.

3.   Proficiently operate autonomous rotorcraft flight vehicle.

Course Number and Name: **ANT 2813   Commercial Applications I - UAS**

Classification: Technical Elective

Description: Commercial applications of UAS technology within the agricultural, surveying, and film and videography industries.

Hour Breakdown:

Scheduled Hours	Lecture	Lab	Clock Hours
3	2	2	60

National Assessment: Not Applicable

Prerequisite: ANT 2643 or Instructor Approved

Student Learning Outcomes:

1.   Create an operational mission plan for the following commercial applications:
        a.   Precision Agriculture
        b.   Surveying
        c.   Film and Videography

2.   Demonstrate control of the multi-rotor and fixed wing aircraft to execute missions for precision agriculture, surveying, and film and videography.

3.   Download, process, and interpret the data received from the UAS mission.

4.   Using the data received from the UAS mission, produce and present findings.

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Course Number and Name: **ANT 2823**   **Commercial Applications II - UAS**

Classification: Technical Elective

Description: Commercial applications of UAS technology including: aerial photography, film, and videography; structural inspections; law enforcement; search and rescue (SAR); sports video; and, real estate marketing.

Hour Breakdown:

Scheduled Hours	Lecture	Lab	Clock Hours
3	2	2	60

National Assessment: Not Applicable

Prerequisite: ANT 2813 or Instructor Approved

Student Learning Outcomes:

1.   Create an operational mission plan for the following commercial applications:
    a.   Aerial photography
    b.   Film and videography
    c.   Structural inspections
    d.   Law enforcement
    e.   Search and rescue
    f.   Sports video
    g.   Real estate marketing

2.   Demonstrate control of the multi-rotor and fixed wing aircraft to execute missions for precision agriculture, surveying, and film and videography.

3.   Download, process, and interpret the data received from the UAS mission.

4.   Using the data received from the UAS mission, produce and present findings.

Course Number and Name: **ANT 2853   Linux Essentials - UAS**

Classification: Technical Elective

Description: The fundamentals of the Linux operating system and command line. Students will understand Linux as an operating system, basic open source concept, and how it is used. Students will become familiar with the application of Linux to autopilot technology.

Hour Breakdown:

Scheduled Hours	Lecture	Lab	Clock Hours
3	3	0	45

National Assessment: LPI Linux Essentials Certificate of Achievement

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Understand Linux as an operating system; explain considerations for the system.

2. Understand the basics of open source software and licensing.

3. Acquire knowledge and basic Linux skills for:
    a. command line; navigation help systems; files and directories
    b. searching and extracting data; scripting
    c. components of desktop and server computers
    d. location of stored data

4. Identify various types of users on a Linux system; create users and groups.

5. Manage file permissions and ownership: understand special directories and files.

6. Understand the utilization of Linux software in UAS operations.

Course Number and Name: **ANT 2863**   **Linux System Administration I - UAS**

Classification: Technical Elective

Description: Provides the knowledge necessary to perform basic Linux server administration at a professional level. Install, configure and administer Linux systems; process text and build complex commands. Students will learn to perform flight data processing and retrieval applications.

Hour Breakdown:

Scheduled Hours	Lecture	Lab	Clock Hours
3	3	0	45

National Assessment: LPIC-1 Linux Server Professional Certification Exam 101

Prerequisite: Instructor Approved

Student Learning Outcomes:

1.   Determine and configure hardware settings; boot the system.

2.   Change run levels and shutdown or reboot system.

3.   Acquire knowledge and Linux skills for:
   a.   Design hard disk layout; install a boot manager; manage shared libraries.
   b.   Use Debian package management; use RPM and YUM package management.
   c.   Work on the command line; process text streams; perform file management.
   d.   Create, monitor, and kill processes; modify execution priorities; search files.
   e.   Perform file editing using vi; create partitions and file systems.
   f.   Manage disk quotas; manage file permissions and ownership.
   g.   Implement updated controls to facilitate ground-based UAV operations.

4.   Create and change hard and symbolic links.

5.   Find system files and place files in the correct location.

Course Number and Name: **ANT 2873**   **Linux System Administration II - UAS**

Classification: Technical Elective

Description: Provides the knowledge necessary to perform basic Linux server administration at a professional level. Write shell scripts, manage databases, work with user desktop interface settings, perform administration tasks, configure and run essential services, configure and trouble shoot networking and security tasks. Students will learn to perform telemetry management.

Hour Breakdown:

Scheduled Hours	Lecture	Lab	Clock Hours
3	3	0	45

National Assessment: LPIC-1 Linux Server Professional Certification Exam 102

Prerequisite: Instructor Approved

Student Learning Outcomes:

1.   Customize and use the shell environment and write scripts.

2.   Manage SQL data; install and configure X11; setup a display manager.

3.   Acquire knowledge and Linux skills for:
   a.   Managing user and group accounts; scheduling jobs; maintain system time
   b.   System logging; Mail Transfer Agent (MTA) basics; manage printers
   c.   Internet protocols; network configuration and troubleshooting
   d.   Configure client side DNS
   e.   Applying Linux applications to UAS equipment and operations

4.   Perform Security administration tasks:
   a.   Setup host security
   b.   Secure data with encryption

TECHNICAL ELECTIVES

Course Number and Name: **ANT 291(1-6)   Special Problems in Aviation Technology**

Classification: Technical Elective

Description: This course provides students with an opportunity to utilize skills and knowledge gained in other Aviation Technology courses. The instructor and student work closely together to select a topic and establish criteria for completion of the project.

Hour Breakdown:

Scheduled Hours	Lecture	Lab	Clock Hours
1	0	2	30
2	0	4	60
3	0	6	90
4	0	8	120
5	0	10	150
6	0	12	180

National Assessment: Not Applicable

Prerequisite: Instructor Approved

Student Learning Outcomes:

1.   Develop a written plan which details the activities and projects to be completed.
   a.   Use a written plan which details the activities and projects to be completed.
   b.   Perform written occupational objectives in the special problem.

2.   Assess accomplishment of objectives.
   a.   Prepare daily written assessments of accomplishment of objectives.
   b.   Present weekly written reports to the instructor of activities performed and objectives accomplished.

3.   Use and follow a set of written guidelines for the special problem.
   a.   Develop and follow a set of written guidelines for the special problem.

Course Number and Name: ANT 292(1-6)   **Supervised Work Experience**

Classification: Technical Elective

Description: This course provides an internship opportunity in area of specialization. Supervised work in government or industry to gain experience in the aviation fields.

Hour Breakdown:

Scheduled Hours	Lab/Lecture	Clinical/Internship	Clock Hours
1	0	3	45
2	0	6	90
3	0	9	135
4	0	12	180
5	0	15	225
6	0	18	270

National Assessment: Not Applicable

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Follow a set of instructor-written guidelines for the supervised work experience program.

2. Apply skills needed to be a viable member of the workforce.
    a. Prepare a description of skills to be developed in the supervised work experience program.
    b. Practice skills needed to be a viable member of the workforce.

2. Practice human relationship skills in the supervised work experience program.

3. Practice positive work habits, responsibilities, and ethics.

4. Develop written occupational objectives in the supervised work experience program.

6. Assess performance of occupational skills.
    a. Prepare daily written assessments of work performance as specified in the occupational objectives.
    b. Present weekly written reports to the instructor of activities performed and objectives accomplished.

RECOMMENDED TOOLS AND EQUIPMENT

Capitalized Items

1. Eclipse Flight Yokes (4)
2. ProPedals (USB) (4)
3. Table Top Display Board (Airport Layout)
4. Communications Simulator (mixer, microphones, headsets)
5. Desktop Computers (6)
6. Laptop Computers (2)

Non-Capitalized Items

1. Web Cameras (4)
2. Head Set (microphone and speaker)

Recommended Instructional Aids

It is recommended that instructors have access to the following items:

1. Computer with CD/DVD (1)
2. Printer (1)
3. Screen, Data Projector (1)
4. DVD Player (1)
5. Web Camera (1)
6. Laptop Computer (1)
7. Head set (microphone and speaker) (1)

Recommended Software

1. Flight Simulator software
2. GFD (Guided Flight Discovery)

CURRICULUM DEFINITIONS AND TERMS

- Course Name – A common name that will be used by all community colleges in reporting students

- Course Abbreviation – A common abbreviation that will be used by all community and junior colleges in reporting students

- Classification – Courses may be classified as the following:
    - Career Certificate Required Course – A required course for all students completing a career certificate.
    - Technical Certificate Required Course – A required course for all students completing a technical certificate.
    - Technical Elective – Elective courses that are available for colleges to offer to students.

- Description – A short narrative that includes the major purpose(s) of the   ?????

- Prerequisites – A listing of any courses that must be taken prior to or on enrollment in the course

- Corequisites – A listing of courses that may be taken while enrolled in the course

- Student Learning Outcomes – A listing of the student outcomes (major concepts and performances) that will enable students to demonstrate mastery of these competencies

The following guidelines were used in developing the program(s) in this document and should be considered in compiling and revising course syllabi and daily lesson plans at the local level:
- The content of the courses in this document reflects approximately 75% of the time allocated to each course. The remaining 25% of each course should be developed at the local district level and may reflect the following:
    - Additional competencies and objectives within the course related to topics not found in the state framework, including activities related to specific needs of industries in the community college district
    - Activities that develop a higher level of mastery on the existing competencies and suggested objectives
    - Activities and instruction related to new technologies and concepts that were not prevalent at the time the current framework was developed or revised
    - Activities that include integration of academic and career–technical skills and course work, school-to-work transition activities, and articulation of secondary and postsecondary career–technical programs
    - Individualized learning activities, including work-site learning activities, to better prepare individuals in the courses for their chosen occupational areas

- Sequencing of the course within a program is left to the discretion of the local college. Naturally, foundation courses related to topics such as safety, tool and equipment usage, and other fundamental skills should be taught first. Other courses related to specific skill areas and related academics, however, may be sequenced to take advantage of seasonal and climatic conditions, resources located outside of the school, and other factors. Programs that offer an Associate of Applied Science Degree must include all of the required Career Certificate courses, Technical Certificate courses **AND** a minimum of 15 semester hours of General Education Core Courses. The courses in the General Education Core may be spaced out over the entire length of the program so that students complete some academic and Career Technical courses each semester. Each community college specifies the actual courses that are required to meet the General Education Core Requirements for the Associate of Applied Science Degree at their college.

- In order to provide flexibility within the districts, individual courses within a framework may be customized by doing the following:

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- Adding new student learning outcomes to complement the existing competencies and suggested objectives in the program framework.
- Revising or extending the student learning outcomes
- Adjusting the semester credit hours of a course to be up 1 hour or down 1 hour (after informing the Mississippi Community College Board [MCCB] of the change)