AVIATION TECHNOLOGY I

MIS03 17812

Students are provided with an understanding of the science of flight and include the history and possible career paths within the aviation industry. Aviation covers physics, the relationships of weight and balance, principles of navigation and flight control, ground and airport operations and services, and Federal Aviation Administration regulations.

Credit 1 or 2 credit

Level Grades 10-12

Standard 1	BAS	ICS AND CONTROL SYSTEMS	
Topic 1.1	Aircraft Basics		
		Student Competencies	
	1.1.1	Identify the components of different types of aircraft, both exterior and interior.	
	1.1.2	Compare and contrast categories and classes of aircraft: airplane, rotorcraft, glider, powered-lift, and lighter-than-air.	
	1.1.3	Compare and contrast the various categories into which aircraft are organized during certification: normal, experimental, restricted, acrobatic, utility, and transport.	
Topic 1.2	Aircraft Flight Instruments		
		Student Competencies	
	1.2.1	Identify the seven basic/standard instruments.	
	1.2.2	Describe the operation/limitations of the pitot-static system.	
	1.2.3	Describe the operation/limitations of the gyroscopic system.	
	1.2.4	Describe the operation/limitations of the magnetic system.	
Topic 1.3	Flight Syst	tems	
		Student Competencies	
	1.3.1	Explain the function of the battery, alternator, and magneto.	
	1.3.2	Discuss fuel systems.	

	1.3.3	Explain the cycle of an internal combustion engine.
	1.3.4	Describe common errors with the induction system.
	1.3.5	Compare differences between fixed pitch and constant speed propellers.
	1.3.6	Explain the operation and limitations of the flight control system (primary and secondary).
	1.3.7	Explain the operation and limitations of the powerplant.
	1.3.8	Explain the operation and limitations of the gear system.
	1.3.9	Explain the operation and limitations of the gear system. Explain the operation and limitations of the environmental system.
	1.3.7	Explain the operation and initiations of the environmental system.
Standard 2	SCII	ENCE OF FLIGHT
Topic 2.1	Aerodyna	mics of Flight
		Student Competencies
	2.1.1	Describe and explain the relationship the four forces of flight.
	2.1.2	Define the angle of attack and critical angle of attack.
	2.1.3	Describe the types of drag, both parasite and induced.
	2.1.4	Explain various wing shapes and how wing tip vortices are created.
	2.1.5	Discuss and compare the four main types of wing flaps and the advantages and disadvantages to their uses.
	2.1.6	Explain how Newton's Third Law and Bernoulli's principle affect lift.
	2.1.7	Identify the parts of an airfoil (e.g., chord line, relative wind, camber, leading edge, trailing edge).
	2.1.8	Describe the aerodynamics of a stall.
	2.1.9	Define static and dynamic stability.
Topic 2.2	Weather T	
	2.2.1	Student Competencies
	2.2.1	Identify the gases and ratios found within the atmosphere.
	2.2.2	Describe factors that affect atmospheric weather patterns.
	2.2.3	Identify and explain the various family of clouds.
	2.2.4	Explain the formation of clouds and the conditions necessary to form each type.
	2.2.5	Explain and compare the various types of precipitation.
	2.2.6	Explain the importance of atmospheric stability and cloud formation.
	2.2.7	Compare dew point and humidity.
	2.2.8	Identify the various stages of thunderstorms and the hazards to flight.
Topic 2.3	Weather I	Products and Reports Student Competencies
	2.3.1	Identify Terminal Aerodrome Forecast (TAF) codes (e.g., TEMPO, FM).
	2.3.2	Explain, analyze, and apply TAFs.
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	2.3.3	Explain the importance of a winds aloft forecast.
	2.3.4	Identify abbreviations (e.g., RA, BR, and SN) used in METAR weather reports.
	2.3.5	Decode, analyze, and apply METARs.
	2.3.6	Analyze weather graphics.
	2.3.7	Determine weather products issuance and valid times.
Topic 2.4	Weight an	
	_	Student Competencies
	2.4.1	Define weight and balance terms (e.g., center of gravity, basic empty, weight and useful load).
	2.4.2	Identify the methods of calculating weight and balance.
	2.4.3	Explain the effects of weight on aircraft performance.
	2.4.4	Explain the effects of forward/aft center of gravity on aircraft performance.
	2.4.5	Determine the center of gravity using the computation method.
Topic 2.5	E6B Fligh	t Computer
		Student Competencies
	2.5.1	Calculate Time/Distance/Rate problems.
	2.5.2	Compute groundspeed and wind correction angle.
Topic 2.6		nce Calculations
1 υρις 2.υ	1 CHOHIII	Student Competencies
	2.6.1	Determine aircraft performance problems.
	2.6.2	Determine aircraft performance problems. Determine aircraft performance predictions using current aircraft information and atmospheric conditions.
	2.6.3	Compare predicted aircraft performance vs. actual aircraft performance (actual or simulated).
	2.6.4	
	2.0.4	Determine predicted aircraft performance changes if a modification to airframe or powerplant occurs.
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Standard	CDC	OUND AND INFLIGHT OPERATIONS
3	OAC	OND AND INFLIGHT OF ENAITONS
Topic 3.1	Airport O	nerations
Topic 3.1	An port O	
		Student Competencies
	2 1 1	Student Competencies Discuss and available and standard and reported and traffic metterns
	3.1.1	Discuss and explain each leg of standard and nonstandard traffic patterns.
	3.1.2	Discuss and explain each leg of standard and nonstandard traffic patterns. Describe how runway numbers are determined.
		Discuss and explain each leg of standard and nonstandard traffic patterns.

	3.1.5	F1-1-4
		Explain the purpose of a blast pad.
T	3.1.6	Recognize visual aids and their purpose (e.g., signs, lights, and markings).
Topic 3.2	Airspace	
		Student Competencies
	3.2.1	Compare the classes of controlled and uncontrolled airspaces and airports.
	3.2.2	Identify the airspace dimensions needed for each class of airspace.
	3.2.3	Recognize various classes of airspace on sectional charts.
	3.2.4	Identify the minimum weather requirements for each class of airspace.
	3.2.5	Categorize the pilot qualifications needed for each class of airspace.
	3.2.6	Explain the aircraft requirements for each class of airspace.
	3.2.7	Determine when it would be necessary to request a special VFR clearance.
Topic 3.3	Flight Con	nmunication
		Student Competencies
	3.3.1	Demonstrate use of the phonetic alphabet and numbers.
	3.3.2	Convert local times to Zulu time and vice versa.
	3.3.3	Discuss the purpose of the following facilities/frequencies: ground control, tower, CTAF, Unicom, FSS,
	3.3.3	approach/departure control, ATIS and enroute center.
	3.3.4	Describe the purpose of an airplane's transponder.
	3.3.5	Explain the standard and emergency squawk codes.
	3.3.6	Explain light gun signals and their purpose.
Topic 3.4	Navigation	1
		Student Competencies
	3.4.1	Identify pilotage and dead reckoning techniques.
	3.4.2	Explain when radio navigation would be beneficial.
	3.4.3	Plan a flight using VOR navigation techniques.
	3.4.4	Plan a flight using GPS navigation techniques.
	3.4.5	Demonstrate appropriate radio navigation techniques using VOR and GPS.
Topic 3.5	Cross Cou	ntry Flight Planning
	_	Student Competencies
	3.5.1	Demonstrate use of flight planning tools (e.g., AFD, E6B, and Plotter Sectional charts).
	3.5.2	Plan a XC flight using multiple navigation techniques.
	3.5.3	Complete nav-log for preflight planning.

Standard	PEO	PLE, TRENDS, AND CAREERS IN
4		ATION
Topic 4.1	Events and	l Trends in Aviation
		Student Competencies
	4.1.1	Discuss important people in aviation history and their contribution to the field of aviation.
	4.1.2	Determine the progression of aviation technology (e.g., Pre-Heavier than air flight, gliders (pre-Wright brothers), World War I and II, the jet age, and NextGen aviation).
	4.1.3	Identify and explain current issues (including socio-economic challenges) in aviation.
Topic 4.2	Aviation T	raining Requirements
		Student Competencies
	4.2.1	Describe flight training processes.
	4.2.2	Determine the period of time for medical certificate validity.
	4.2.3	Identify the mission of aviation organizations (e.g., AOPA, EAA, CAP).
	4.2.4	Determine FAA Pilot certificate requirements.
Topic 4.3	Flight Phy	rsiology
		Student Competencies
	4.3.1	Explain the PAVE checklist.
	4.3.1	Explain the TAVE electrist.
	4.3.1	Discuss the IMSAFE checklist.
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