







# Multiple Category Scope and Sequence: Scope and Sequence Report For Course Standards and Objectives, Content, Skills, Vocabulary

Wednesday, August 20, 2014, 1:22PM



Unit	Course Standards and Objectives	Content	Skills	Vocabulary
District Intermediate <a href="#">Aircraft Systems (District)</a> 2014-2015 <a href="#">Readicker, Carl</a>	<a href="#">Aircraft Instruments</a>  (Week 1, 3 Weeks) 	<p><b><u>What are the basic 6 instruments</u></b></p> <ul style="list-style-type: none"> <li>▪ Airspeed indicator</li> <li>▪ Attitude indicator</li> <li>▪ Altimeter</li> <li>▪ Turn coordinator</li> <li>▪ Heading indicator</li> <li>▪ Vertical speed indicator</li> </ul> <p><b><u>What are pitot static instruments</u></b></p> <ul style="list-style-type: none"> <li>▪ Airspeed indicator</li> <li>▪ Altimeter</li> <li>▪ Vertical speed indicator</li> </ul> <p><b><u>What are gyroscopic instruments</u></b></p> <ul style="list-style-type: none"> <li>▪ Heading indicator</li> <li>▪ Attitude indicator</li> <li>▪ Turn coordinator</li> </ul>	<ul style="list-style-type: none"> <li>▪ Name basic six instruments</li> <li>▪ Differentiate between pitot static and gyroscopic instruments</li> <li>▪ Formulate a plan for instrument failure</li> </ul>	<ul style="list-style-type: none"> <li>▪ Instrument</li> <li>▪ Systems</li> <li>▪ Pilotage</li> <li>▪ Pitot-Static System</li> <li>▪ Auxiliary Instruments</li> <li>▪ Dynamic Air Pressure</li> <li>▪ Ambient Air Pressure</li> <li>▪ Flight Instruments</li> <li>▪ Indicated Airspeed</li> <li>▪ True Airspeed</li> <li>▪ Machmeter</li> <li>▪ Airspeed Indicator</li> <li>▪ Attitude Indicator</li> <li>▪ Altimeter</li> <li>▪ Turn Coordinator</li> <li>▪ Heading Indicator</li> <li>▪ Vertical Speed Indicator</li> </ul>
	<a href="#">Structures and Flight Controls</a>  (Week 3, 3 Weeks) 	<p><b><u>Basic Aircraft Structure</u></b></p> <ul style="list-style-type: none"> <li>▪ Fuselage</li> <li>▪ Empennage</li> </ul> <p><b><u>Basic Aircraft Flight Controls</u></b></p> <ul style="list-style-type: none"> <li>▪ Ailerons</li> <li>▪ Flaps</li> <li>▪ Elevator</li> <li>▪ Rudder</li> <li>▪ Trim Tabs</li> </ul>	<ul style="list-style-type: none"> <li>▪ Distinguish flight controls and effects of each</li> <li>▪ Compare different manufacturers</li> <li>▪ Investigate power to weight ratio</li> </ul>	<ul style="list-style-type: none"> <li>▪ Flight controls</li> <li>▪ Monocoque</li> <li>▪ Semi-monocoque</li> <li>▪ Structural Loads</li> <li>▪ Stress</li> <li>▪ Spar</li> <li>▪ Pushrods</li> <li>▪ Pressurized Cabin</li> <li>▪ Aileron</li> <li>▪ Rudder</li> <li>▪ Elevator</li> <li>▪ Yaw</li> <li>▪ Pitch</li> <li>▪ Roll</li> </ul>

## Aircraft Propellers and

Governors  (Week 4, 3 Weeks)



### Basic Propeller Design and Operation

- Constant Speed Propeller
- Fixed Pitch Propeller
- Forces Acting on a Rotating Propeller

### Governor Operation

- Constant Speed Propeller
- Fixed Pitch Propeller

- Compare propeller operation Constant speed/ Fixed pitch
- Evaluate the forces acting on a propeller

- Propeller
- Governor
- Pitch
- Pusher Propeller
- Tractor Propeller
- Feathering
- Constant-speed propeller
- Unfeathering

## Engine Lubrication and Cooling

 (Week 6, 3 Weeks) 

### How are Aircraft Engines Cooled

- Cowl flaps
- Cowling
- Air-cooled
- Augmenters
- Thermal shock

### How are Aircraft Engines Lubricated

- Wet-sump lubrication system
- Dry-sump lubrication system

- Assess proper preheat methods before flight
- Display an understanding of proper engine cool down after flight

- Cooling
- Engine Lubrication
- Cushion
- Friction
- Cleansing
- Viscosity
- Flash point
- Cloud point
- Cowling
- Cylinder cooling fins
- Cowl Flaps
- Thermocouple
- Thermal Shock

## Reciprocating Engine Theory

 (Week 8, 3 Weeks) 

### What are the operating principles of a four-cycle engine

- Four cycles of an airplane engine
- Engine gages and trouble shooting

### What are the internal working parts of an aircraft engine

- Piston
- Crankshaft
- Valves
- Cam-shaft
- Top dead center
- Bottom dead center

- Label all parts of a reciprocating engine
- Evaluate options in engine failure in flight
- Check operation of magneto's before flight

- Reciprocating engine
- Cylinder
- Stroke
- Combustion Chamber
- Four-Stroke Cycle
- Compression
- Preignition
- Spark Plug

## Aircraft Engine Type and

### What are the most common

- Predict engine performance

- Turboprop

**Construction**  (Week 11, 2 Weeks) 

**configurations of aircraft engines**

- Horizontal opposed engine
- Radial engine
- V-type engines
- In-line engines

- Distinguish engine internal parts
- Recite the cycles of reciprocating engines
- Use tools to disassemble engines and rebuild
- Demonstrate skill in naming parts of a carburator
- Reciprocating
- Turbojet
- Fanjet
- Opposed Engine
- Radial Engine
- V-type engine
- Crankshaft
- Connecting Rod
- Piston
- Camshaft

**What are the most common types of engines used for aviation application**

- Reciprocating engines
- Turbojet engines
- Turboprop engines
- Ramjet
- Pulse-jet
- Rocket

**Pneumatic and Deicing System**  (Week 13, 3 Weeks) 

**What are basic and more complex pneumatic systems used today**

- Full pneumatic system
- Low pressure pneumatic system,

- Differentiate between anti-icing and deicing
- Check and evaluate weather conditions before flight
- Categorize ice encounter options
- Evaluate an out incase a flight can not be completed
- Pneumatic
- Deicing
- Anti-icing
- Weeping Wing
- Boots
- Vacuum System
- Electric anti-icing

**How is ice build up prevented or removed from aircraft**



- Anti-icing
- Deicing
- Thermal anti-icing
- Electric anti-icing

**Electrical Components**  (Week 15, 2 Weeks) 

**Basic understanding of the aircraft electrical system**

- Series and Parallel circuits
- Voltage and current measuring instruments
- Function of the busbar
- Battery

- Cite emergency checklist and prioritize events
- Analyze effects of loss of electrical components
- Detect changes in electrical components
- Assess options incase of electrical failure
- Battery
- Load
- Voltmeter
- Ammeter
- Busbar
- Ignition System
- Magneto System
- Ignition Lead

**Inspections, Maintenance and Weight and Balance**  (Week 17, 3 Weeks) 

**Weight and balance**

- Importance of keeping an aircraft within weight and balance

- Consider the advantages of aircraft ownership
- Know what the challenges of aircraft ownership would be
- Plan on a pathway that might
- Weight and Balance
- Center of Gravity
- Tail Down Force
- Datum

- The difference between weight and balance
- Using FAA charts to figure problems with weight and balance

#### **Inspections**

- 50 hour inspection
- 100 hour inspection
- Annual inspection
- TBO

#### **Pilot maintenance**

- What can a pilot do on his/her own airplane

- be of interest
- Differentiate between performance in hot and cold weather
- Plan for periods of high density altitude

- Station
- Takeoff Weight
- Landing Weight
- Preflight Inspection
- Annual Inspection
- Log Book
- Maintenance

