Aircraft Pilot Training I

8731 36 weeks / 140 hours

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Acknowledgments

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Nathan K. Pope, Writer/Editor
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Virginia Department of Education Staff
Course Description

Suggested Grade Level: 10 or 11

Students participate in flight training, ground school, and simulator instruction to support the flight syllabus while studying meteorology, aerodynamics, navigation, physiology, airfield and flight environments, aircraft maneuvers, and aircraft weight and balance.

As noted in Superintendent's Memo #058-17 (2-28-2017), this Career and Technical Education (CTE) course must maintain a maximum pupil-to-teacher ratio of 20 students to one teacher, due to safety regulations. The 2016-2018 biennial budget waiver of the teacher-to-pupil ratio staffing requirement does not apply.

Task Essentials Table

- Tasks/competencies designated by plus icons (⊕) in the left-hand column(s) are essential
- Tasks/competencies designated by empty-circle icons (○) are optional
- Tasks/competencies designated by minus icons (⊖) are omitted
- Tasks marked with an asterisk (*) are sensitive.

<table>
<thead>
<tr>
<th>Task Number</th>
<th>8731</th>
<th>Tasks/Competencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examining the Forces that Act on Aircraft</td>
<td></td>
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</tr>
<tr>
<td>39</td>
<td>⊕</td>
<td>Describe the aerodynamic forces acting on an aircraft during flight.</td>
</tr>
<tr>
<td>40</td>
<td>⊕</td>
<td>Explain Bernoulli’s principle.</td>
</tr>
<tr>
<td>41</td>
<td>⊕</td>
<td>Explain center of gravity as it relates to aircraft.</td>
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<tr>
<td>-------------</td>
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</tr>
<tr>
<td>42</td>
<td>+</td>
<td>Define <em>longitudinal stability</em>.</td>
</tr>
<tr>
<td>43</td>
<td>+</td>
<td>Describe airfoil, center of pressure, and mean camber line.</td>
</tr>
<tr>
<td>44</td>
<td>+</td>
<td>Explain airspeed, air density, lift, and drag as related to the aircraft.</td>
</tr>
<tr>
<td>45</td>
<td>+</td>
<td>Explain the importance of planform design as related to the overall aerodynamic characteristic of a wing.</td>
</tr>
<tr>
<td>46</td>
<td>+</td>
<td>Describe aircraft flight controls.</td>
</tr>
<tr>
<td>47</td>
<td>+</td>
<td>Describe the relationship among lift, drag, thrust, weight, and stall.</td>
</tr>
<tr>
<td>48</td>
<td>+</td>
<td>Explain torque effect.</td>
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<tr>
<td>49</td>
<td>+</td>
<td>Explain stability and controllability.</td>
</tr>
<tr>
<td>50</td>
<td>+</td>
<td>Describe stalls and spins.</td>
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<tr>
<td>51</td>
<td>+</td>
<td>Explain steady-state climb and flight.</td>
</tr>
<tr>
<td>52</td>
<td>+</td>
<td>Explain how an aircraft turns.</td>
</tr>
<tr>
<td>53</td>
<td>+</td>
<td>Explain airfoil design, pressure distribution, and the effects of altitude.</td>
</tr>
<tr>
<td>54</td>
<td>+</td>
<td>Describe the three axes of an aircraft.</td>
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<tr>
<td>55</td>
<td>+</td>
<td>Describe limitation factors in various aircraft designs.</td>
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<tr>
<td>56</td>
<td>+</td>
<td>Explain aircraft design.</td>
</tr>
<tr>
<td>57</td>
<td>+</td>
<td>Describe leading-edge devices.</td>
</tr>
<tr>
<td>58</td>
<td>+</td>
<td>Explain the operation of a stabilator.</td>
</tr>
<tr>
<td>59</td>
<td>+</td>
<td>Explain characteristics, forces, and principles related to the AOA.</td>
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<tr>
<td>60</td>
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<td>Describe the purpose of the stabilizer.</td>
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<tr>
<td>61</td>
<td>+</td>
<td>Describe various types of static stability as related to aircraft.</td>
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<tr>
<td>62</td>
<td>+</td>
<td>Describe the purpose and operation of wing spoilers.</td>
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<td>63</td>
<td>+</td>
<td>Explain lift-to-drag ratio.</td>
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<td>64</td>
<td>+</td>
<td>Explain ice formation on an aircraft.</td>
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<tr>
<td>65</td>
<td>+</td>
<td>Describe wake turbulence characteristics and avoidance techniques.</td>
</tr>
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<td>66</td>
<td>+</td>
<td>Explain ground effect on aircraft performance.</td>
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<tr>
<td>67</td>
<td>+</td>
<td>Describe effects on airspeed during a turn.</td>
</tr>
<tr>
<td>68</td>
<td>+</td>
<td>Explain load factor.</td>
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<tr>
<td>69</td>
<td>+</td>
<td>Explain the effect of airspeed.</td>
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Examining Aircraft Instruments, Components, Systems, and Performance

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<td>+</td>
<td>Identify gyroscopic aircraft instruments.</td>
</tr>
<tr>
<td>71</td>
<td>+</td>
<td>Describe various types of altitude as related to aircraft.</td>
</tr>
<tr>
<td>72</td>
<td>+</td>
<td>Interpret altimeter readings and settings.</td>
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<tr>
<td>73</td>
<td>+</td>
<td>Interpret information on a Horizontal Situation Indicator (HSI).</td>
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<td>74</td>
<td>+</td>
<td>Interpret readings on a turn-and-slip indicator.</td>
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<tr>
<td>75</td>
<td>+</td>
<td>Define terms related to airspeed.</td>
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<tr>
<td>76</td>
<td>+</td>
<td>Describe indicating systems.</td>
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<tr>
<td>77</td>
<td>+</td>
<td>Interpret speed indicator readings.</td>
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<tr>
<td>78</td>
<td>+</td>
<td>Explain the effect of temperature changes on the altimeter.</td>
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<td>79</td>
<td>+</td>
<td>Describe altimeter settings and setting procedures.</td>
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<tr>
<td>80</td>
<td></td>
<td>Explain the importance of accurate altimeters.</td>
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<td>81</td>
<td></td>
<td>Explain airspeed as it relates to aircraft performance.</td>
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<tr>
<td>82</td>
<td></td>
<td>Describe the operation of a propeller.</td>
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<tr>
<td>83</td>
<td></td>
<td>Describe fixed-pitch propellers.</td>
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<tr>
<td>84</td>
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<td>Describe V-speeds.</td>
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<tr>
<td>85</td>
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<td>Explain the use of turn-and-slip indicators and turn coordinators in basic instrument flying.</td>
</tr>
<tr>
<td>86</td>
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<td>Explain the operation of a magnetic compass.</td>
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<td>87</td>
<td></td>
<td>Describe the pitot-static system.</td>
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<td>88</td>
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<td>Describe an aircraft's pneumatic system.</td>
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<tr>
<td>89</td>
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<td>Explain the effects of carburetor heat.</td>
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<td>90</td>
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<td>Describe factors that cause carburetor ice.</td>
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<tr>
<td>91</td>
<td></td>
<td>Describe effects of carburetor ice.</td>
</tr>
<tr>
<td>92</td>
<td></td>
<td>Describe the reciprocating engine.</td>
</tr>
<tr>
<td>93</td>
<td></td>
<td>Explain the process of controlling engine temperature.</td>
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<tr>
<td>94</td>
<td></td>
<td>Explain powerplant operation.</td>
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<td>95</td>
<td></td>
<td>Explain turbine engine operation.</td>
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<tr>
<td>96</td>
<td></td>
<td>Explain turboprop engine operation.</td>
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<tr>
<td>97</td>
<td></td>
<td>Describe the fuel system.</td>
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<tr>
<td>98</td>
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<td>Describe aircraft fuel.</td>
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<td>Tasks/Competencies</td>
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<td>-------------</td>
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<tr>
<td>99</td>
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<td>Describe detonation in aircraft engines.</td>
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<td>Describe the fuel-air mixture.</td>
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<td>101</td>
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<td>Describe precautions related to aircraft fuel.</td>
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<td>102</td>
<td>+</td>
<td>Describe fuel additives.</td>
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<tr>
<td>103</td>
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<td>Explain the fuel-dump system.</td>
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<tr>
<td>104</td>
<td>+</td>
<td>Describe concerns related to fuel system malfunctions and leaks.</td>
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<tr>
<td>105</td>
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<td>Describe fuel-load concerns.</td>
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<tr>
<td>106</td>
<td>+</td>
<td>Describe the fire-extinguishing system.</td>
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<tr>
<td>107</td>
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<td>Describe aircraft landing gear.</td>
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<tr>
<td>108</td>
<td>+</td>
<td>Describe the aircraft brake system.</td>
</tr>
<tr>
<td>109</td>
<td>+</td>
<td>Describe aircraft circuitry.</td>
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<tr>
<td>110</td>
<td>+</td>
<td>Describe the aircraft electrical system.</td>
</tr>
<tr>
<td>111</td>
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<td>Describe aircraft batteries.</td>
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<tr>
<td>112</td>
<td>+</td>
<td>Identify equipment that depends on the electrical system.</td>
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<tr>
<td>113</td>
<td>+</td>
<td>Explain the aircraft pressurization system.</td>
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<tr>
<td>114</td>
<td>+</td>
<td>Describe anti-icing and de-icing.</td>
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<tr>
<td>115</td>
<td>+</td>
<td>Explain environmental control in aircraft.</td>
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<tr>
<td>116</td>
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<td>Explain the oil system.</td>
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<tr>
<td>117</td>
<td>+</td>
<td>Explain hydraulic systems.</td>
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<tr>
<td>118</td>
<td>+</td>
<td>Describe fuel tanks.</td>
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<tr>
<td><strong>Understanding Airport Operations</strong></td>
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<td>119</td>
<td>☑</td>
<td>Describe airport landing indicators.</td>
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<td>120</td>
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<td>Describe information on an airport diagram.</td>
</tr>
<tr>
<td>121</td>
<td>☑</td>
<td>Describe land and hold short operations (LAHSO).</td>
</tr>
<tr>
<td>122</td>
<td>☑</td>
<td>Describe airport markings, signs, and lighting.</td>
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<tr>
<td>123</td>
<td>☑</td>
<td>Explain noise-avoidance routes.</td>
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<tr>
<td>124</td>
<td>☑</td>
<td>Identify rescue and firefighting vehicles and firefighting agents.</td>
</tr>
<tr>
<td>125</td>
<td>☑</td>
<td>Describe runway conditions.</td>
</tr>
<tr>
<td>126</td>
<td>☑</td>
<td>Describe runway lighting.</td>
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<tr>
<td>127</td>
<td>☑</td>
<td>Describe traffic pattern procedures and communication procedures.</td>
</tr>
<tr>
<td>128</td>
<td>☑</td>
<td>Describe visual glide path indicators.</td>
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<tr>
<td>129</td>
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<td>Describe airport operations lighting.</td>
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<td>130</td>
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<td>Describe taxi operations and procedures.</td>
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<tr>
<td>131</td>
<td>☑</td>
<td>Describe airport traffic entry patterns.</td>
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<tr>
<td>132</td>
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<td>Describe aircraft lighting.</td>
</tr>
<tr>
<td>133</td>
<td>☑</td>
<td>Describe automatic terminal information service (ATIS) broadcasts.</td>
</tr>
<tr>
<td>134</td>
<td>☑</td>
<td>Describe visual flight rules (VFR).</td>
</tr>
<tr>
<td>135</td>
<td>☑</td>
<td>Describe visual meteorological conditions (VMC).</td>
</tr>
<tr>
<td>136</td>
<td>☑</td>
<td>Interpret airspace classes.</td>
</tr>
<tr>
<td>137</td>
<td>☑</td>
<td>Describe operational airspace requirements.</td>
</tr>
<tr>
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<tr>
<td>138</td>
<td>+</td>
<td>Interpret ATC communications.</td>
</tr>
<tr>
<td>139</td>
<td>+</td>
<td>Describe satellite radio navigation systems (RNAV).</td>
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<tr>
<td>140</td>
<td>+</td>
<td>Describe the HSI.</td>
</tr>
<tr>
<td>141</td>
<td>+</td>
<td>Describe an instrument landing system (ILS).</td>
</tr>
<tr>
<td>142</td>
<td>+</td>
<td>Describe the very-high frequency (VHF) omnidirectional range navigation system (VOR).</td>
</tr>
<tr>
<td>143</td>
<td>+</td>
<td>Describe license requirements.</td>
</tr>
</tbody>
</table>

**Exploring Regulations**

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<td>144</td>
<td>+</td>
<td>Describe pilot deviation reports.</td>
</tr>
<tr>
<td>145</td>
<td>+</td>
<td>Describe regulations and equipment and operating requirements related to large transport aircraft.</td>
</tr>
<tr>
<td>146</td>
<td>+</td>
<td>Identify regulations related to admission to flight deck.</td>
</tr>
<tr>
<td>147</td>
<td>+</td>
<td>Define <em>aerobatic flight</em> in accordance with the FAA.</td>
</tr>
<tr>
<td>148</td>
<td>+</td>
<td>Describe ATC clearances.</td>
</tr>
<tr>
<td>149</td>
<td>+</td>
<td>Describe the FAA aircraft classification category.</td>
</tr>
<tr>
<td>150</td>
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<td>Describe aircraft inspection regulations.</td>
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<tr>
<td>151</td>
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<td>Describe aircraft operating limitations.</td>
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<tr>
<td>152</td>
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<td>Describe the responsibilities of aircraft owners and operators.</td>
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<tr>
<td>153</td>
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<td>Describe aircraft return-to-service regulations.</td>
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<td>154</td>
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<td>Explain special-use airspace.</td>
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<td>Explain airworthiness.</td>
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<td>156</td>
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<td>Describe airworthiness directives.</td>
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<td>Describe regulations related to alternate airport requirements.</td>
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<td>Describe alternate airport requirements related to weather.</td>
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<td>Describe altimeter settings.</td>
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<td>Describe approach minima.</td>
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<td>161</td>
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<td>Explain basic flight rules.</td>
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<td>162</td>
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<td>Describe briefing of passengers.</td>
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<td>Describe regulations related to cargo in the passenger compartment.</td>
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<td>Describe certificate issuance and renewal.</td>
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<td>Describe change-of-address regulations.</td>
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<td>Describe regulations related to cockpit voice and flight data recorders.</td>
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<tr>
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<td>Describe commercial operation requirements and conditions (OpSpecs).</td>
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<td>168</td>
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<td>Explain regulations related to communications en route.</td>
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<td>Describe procedures to remedy communications failure.</td>
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<td>Explain compliance with local regulations.</td>
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<td>Describe regulations and requirements related to controlled or restricted airspace.</td>
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<td>Describe regulations related to declaration of an emergency.</td>
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<td>Describe regulations related to destination airport visibility.</td>
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<td>Describe regulations related to dispatch.</td>
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<td>Describe regulations related to the display and inspection of licenses and certificates.</td>
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<td>Identify documents to be carried on aircraft during flight.</td>
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<td>Describe regulations related to dropping objects.</td>
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<td>Describe regulations related to emergency locator transmitters (ELT).</td>
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<td>Explain emergency deviation from regulations.</td>
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<td>Describe regulations related to safety equipment.</td>
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<td>Describe regulations related to instruments and equipment.</td>
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<td>Describe regulations related to equipment failure.</td>
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<td>Describe regulations related to operating experience and training.</td>
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<td>Describe regulations related to fire extinguishers.</td>
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<td>Describe duty period limitations.</td>
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<td>Describe flight engineer requirements.</td>
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<td>Describe regulations related to flight instructor requirements.</td>
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<td>Describe regulations related to flight release under VFR.</td>
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<td>Describe regulations related to general right-of-way rules.</td>
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<td>Describe regulations related to notification.</td>
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<td>Describe crewmember duties and responsibilities.</td>
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<td>Describe pilot-in-command authority and responsibility.</td>
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<td>Describe regulations related to passengers’ use of seats, safety belts, and harnesses.</td>
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Curriculum Framework

Examining the Forces that Act on Aircraft

Task Number 39

Describe the aerodynamic forces acting on an aircraft during flight.

Definition

Description should include the four forces acting on an airplane during flight:

- Weight
- Lift
- Thrust
- Drag

Task Number 40

Explain Bernoulli’s principle.

Definition

Explanation should include the concept that the internal pressure of a fluid decreases at points where the speed of the fluid increases.
Task Number 41

Explain center of gravity as it relates to aircraft.

Definition

Explanation should include the significance of an aircraft’s center of gravity (CG) when in flight:

- Compliance with the weight and balance limits of any airplane is critical to flight safety.
- Operating an airplane above the maximum weight limitation compromises the structural integrity of the airplane and adversely affects its flight performance.

Task Number 42

Define longitudinal stability.

Definition

Definition should include the concept that longitudinal stability is the quality that makes an airplane stable about its lateral axis. It involves the pitching motion as the airplane’s nose moves up and down in flight.

A longitudinally unstable airplane has a tendency to dive or climb progressively into a very steep dive or climb, or even a stall. Thus, an airplane with longitudinal instability becomes difficult and sometimes dangerous to fly.

Task Number 43

Describe airfoil, center of pressure, and mean camber line.

Definition

Description should include the following:

- A cambered airfoil is an asymmetric airfoil for which the mean camber line will be above the chord line.
- Center of pressure is the moment reference center for which the moment is zero; it depends on the angle of attack (AOA).
Task Number 44

Explain airspeed, air density, lift, and drag as related to the aircraft.

Definition

Explanation should include the following:

- Lift and drag vary directly with the density of the air.
- Density is affected by several factors, including pressure, temperature, and humidity.
- In order to maintain its lift at a higher altitude, an aircraft must fly at a greater true airspeed for any given AOA.

Task Number 45

Explain the importance of planform design as related to the overall aerodynamic characteristic of a wing.

Definition

Explanation should include the following:

- Aspect ratio
- Taper ratio
- Sweepback

Task Number 46

Describe aircraft flight controls.

Definition

Description should include the proper use of and techniques associated with the flight control systems a pilot uses to control the forces of flight and the aircraft’s direction and attitude.
Task Number 47

Describe the relationship among lift, drag, thrust, weight, and stall.

Definition

Description should include the following:

- An aircraft stall results from a rapid decrease in lift caused by the separation of airflow from the wing’s surface brought on by exceeding the critical AOA.
- In a stall, the wing does not totally stop producing lift. Rather, it cannot generate adequate lift to sustain level flight.

Task Number 48

Explain torque effect.

Definition

Explanation should include the following:

- Torque effect is the influence of engine torque on aircraft movement and control.
- It is generally exhibited as a left-turning tendency in piston, single-engine, and propeller-driven aircraft.

Task Number 49

Explain stability and controllability.

Definition
Explanation should include the following:

- Stability is the inherent quality of an aircraft to correct for conditions that may disturb its equilibrium and to return to or to continue on the original flight path. It is primarily an aircraft design characteristic.
- The flight paths and attitudes an aircraft flies are limited by the aerodynamic characteristics of the aircraft, its propulsion system, and its structural strength.

PLT244

Task Number 50

Describe stalls and spins.

Definition

Description should include the following:

- An aircraft stall results from a rapid decrease in lift caused by the separation of airflow from the wing’s surface brought on by exceeding the critical AOA. In a stall, the wing does not totally stop producing lift; rather, it cannot generate adequate lift to sustain level flight.
- A stabilized spin is not different from a stall in any element other than rotation, and the same load-factor considerations apply to spin recovery as apply to stall recovery.

PLT245

Task Number 51

Explain steady-state climb and flight.

Definition

Explanation should include the following:

- The pilot can control the lift. Any time the control yoke or stick is moved fore or aft, the AOA is changed.
- As the AOA increases, lift increases (all other factors being equal).
- When the aircraft reaches the maximum AOA, lift begins to diminish rapidly. This is the stalling AOA, known as $C_{L_{-MAX}}$ critical AOA.
Task Number 52

Explain how an aircraft turns.

Definition

Explanation should include the following:

- If an aircraft in straight-and-level flight were viewed from the front, and if the forces acting on the aircraft could be seen, lift and weight would be two apparent forces.
- If the aircraft were in a bank, it would be apparent that lift did not act directly opposite to the weight; rather, it now acts in the direction of the bank.
- When the aircraft banks, lift acts inward toward the center of the turn, perpendicular to the lateral axis as well as upward.

PLT248

Task Number 53

Explain airfoil design, pressure distribution, and the effects of altitude.

Definition

Explanation should include the following:

- Understanding the effects of different wing planforms is important when learning about wing performance and airplane flight characteristics.
- A planform is the shape of the wing as viewed from directly above and deals with airflow in three dimensions.
- Aspect ratio, taper ratio, and sweepback are factors in planform design that are very important to the overall aerodynamic characteristic of a wing.

PLT094

Task Number 54

Describe the three axes of an aircraft.
**Definition**

Description should include the following:

- The axes of an aircraft are three imaginary lines that pass through an aircraft’s CG at 90° angles to each other.
- The longitudinal axis passes through the CG parallel to a line from nose to tail.
- The lateral axis passes parallel to a line from wingtip to wingtip.
- The vertical axis passes through the CG at right angles to the other two axes.

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**Task Number 55**

**Describe limitation factors in various aircraft designs.**

**Definition**

Description should include the following:

- Each aircraft handles somewhat differently because each resists or responds to control pressures in its own way.
- A training aircraft is quick to respond to control applications, while a transport aircraft feels heavy on the controls and responds to control pressures more slowly.
- The competent pilot should have a solid understanding of the forces that act on the aircraft, the advantageous use of these forces, and the operating limitations of the aircraft being flown.

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**Task Number 56**

**Explain aircraft design.**

**Definition**

Explanation should include structures common to most airplanes, such as

- fuselage
- wings
- empennage
- landing gear
• powerplant.

Task Number 57

Describe leading-edge devices.

Definition

Description should include types, effect, purpose, and operation of leading-edge devices such as a canard. Description should also include the following:

• The canard design utilizes the concept of two lifting surfaces.
• The canard functions as a horizontal stabilizer located in front of the main wings.

Task Number 58

Explain the operation of a stabilator.

Definition

Explanation should include the following:

• A stabilator is essentially a one-piece horizontal stabilizer that pivots from a central hinge point.
• When the control column is pulled back, it raises the stabilator’s trailing edge, pulling the nose of the aircraft upward.
• Pushing the control column forward lowers the trailing edge of the stabilator and pitches the nose of the aircraft down.

Task Number 59

Explain characteristics, forces, and principles related to the AOA.
**Definition**

Explanation should include the following:

- Angle of attack is defined as the acute angle between the chord line of the airfoil and the direction of the relative wind.
- In level flight, when thrust is increased, the aircraft speeds up and the lift increases.
- The aircraft will start to climb unless the AOA is decreased just enough to maintain the relationship between lift and weight.
- The timing of this decrease in AOA needs to be coordinated with the increase in thrust and airspeed.
- If the AOA is decreased too fast, the aircraft will descend, and if the AOA is decreased too slowly, the aircraft will climb.

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**Task Number 60**

Describe the purpose of the stabilizer.

**Definition**

Description should include the following:

- At the rear of the fuselage of most aircraft is a horizontal stabilizer and an elevator.
- The stabilizer is a fixed-wing section that provides stability for the aircraft to keep it flying straight.
- The horizontal stabilizer prevents up-and-down, or pitching, motion of the aircraft nose.

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**Task Number 61**

Describe various types of static stability as related to aircraft.

**Definition**

Description should include the following:
• Static stability is the initial tendency, or direction of movement, back to equilibrium. In aviation, it refers to the aircraft’s initial response when disturbed from a given pitch, yaw, or bank.
• Positive static stability is the initial tendency of the aircraft to return to the original state of equilibrium after being disturbed.
• Neutral static stability is the initial tendency of the aircraft to remain in a new condition after its equilibrium has been disturbed.
• Negative static stability is the initial tendency of the aircraft to continue away from the original state of equilibrium after being disturbed.

Task Number 62
Describe the purpose and operation of wing spoilers.
Definition
Description should include the following:
• Spoilers are used on the upper surface of the wing to spoil or reduce lift.
• Spoilers are extended immediately after touchdown to dump lift and thus transfer the weight of the aircraft from the wings onto the wheels for better braking performance.

Task Number 63
Explain lift-to-drag ratio.
Definition
Explanation should include the following:
• The lift-to-drag ratio (L/D) is the amount of lift generated by a wing or airfoil compared to its drag.
• A ratio of L/D indicates airfoil efficiency.
• Aircraft with higher L/D ratios are more efficient than those with lower L/D ratios.
Task Number 64

Explain ice formation on an aircraft.

Definition

Explanation should include the following:

- Icing can occur in clouds any time the temperature drops below freezing and super-cooled droplets build up on an aircraft and freeze.
- Super-cooled droplets are still liquid even though the temperature is below 32° Fahrenheit (F) or 0° Celsius (C).

Task Number 65

Describe wake turbulence characteristics and avoidance techniques.

Definition

Description should include the following:

- Wingtip vortices are greatest when the generating aircraft is heavy, clean, and slow. This condition is most commonly encountered during approaches or departures because an aircraft’s AOA is at the highest to produce the lift necessary to land or take off.
- To minimize the chances of flying through an aircraft’s wake turbulence,
  - avoid flying through another aircraft’s flight path
  - rotate prior to the point at which the preceding aircraft rotated when taking off behind another aircraft.
  - avoid following another aircraft on a similar flight path at an altitude within 1,000 feet
  - approach the runway above a preceding aircraft’s path when landing behind another aircraft and touch down after the point at which the other aircraft wheels contacted the runway.
Explain ground effect on aircraft performance.

Definition

Explanation should include the following:

- Ground effect is caused by air that is trapped between the wing and the landing surface, as if there were an air cushion.

PLT131

Task Number 67

Describe effects on airspeed during a turn.

Definition

Description should include the following:

- Applying aileron pressure is necessary to place the aircraft in the desired angle of bank, while simultaneous application of rudder pressure is necessary to counteract the resultant adverse yaw.
- Because more lift is required during a turn than during straight-and-level flight, the AOA must be increased by applying elevator back pressure. The steeper the turn, the more elevator back pressure that is needed.

PLT164

Task Number 68

Explain load factor.

Definition

Explanation should include the following:

- Any force applied to an airplane to deflect its flight from a straight line produces a stress on its structure; the amount of this force is termed load factor.
- Load factor is the ratio of the total air load acting on the airplane to the gross weight of the airplane. For example, a load factor of 3 means that the total load on an airplane’s structure is three times its gross weight.
• Load factors are usually expressed in terms of “G”—that is, a load factor of 3 may be spoken of as “3 Gs.”

Task Number 69

Explain the effect of airspeed.

Definition

Explanation should include the following:

• Any airplane, within the limits of its structure, may be stalled at any airspeed.
• When a sufficiently high angle of attack is imposed, the smooth flow of air over an airfoil breaks up and separates, producing an abrupt change of flight characteristics and a sudden loss of lift, which results in a stall.

Examining Aircraft Instruments, Components, Systems, and Performance

Task Number 70

Identify gyroscopic aircraft instruments.

Definition

Identification should include the most common instruments containing gyroscopes, such as

• turn coordinator
• heading indicator
• attitude indicator.
Task Number 71

Describe various types of altitude as related to aircraft.

Definition

Description should include the concept that pilots are mainly concerned with five types of altitude:

- **Indicated altitude**—read directly from the altimeter (uncorrected) when it is set to the current altimeter setting.
- **True altitude**—the vertical distance of the aircraft above sea level—the actual altitude; it is often expressed as feet above mean sea level (MSL). Airport, terrain, and obstacle elevations on aeronautical charts are true altitudes.
- **Absolute altitude**—the vertical distance of an aircraft above the terrain, or above ground level (AGL)
- **Pressure altitude**—the altitude indicated when the altimeter setting window (barometric scale) is adjusted to 29.92" Hg. This is the altitude above the standard datum plane, which is a theoretical plane where air pressure (corrected to 15 °C) equals 29.92" Hg. Pressure altitude is used to compute density altitude, true altitude, true airspeed (TAS), and other performance data.
- **Density altitude**—pressure altitude corrected for variations from standard temperature

Task Number 72

Interpret altimeter readings and settings.

Definition

Interpretation should include the following:

- There are two means by which the altimeter pointers can be moved. The first is a change in air pressure; the other is an adjustment to the barometric scale.
- When the aircraft climbs or descends, changing pressure within the altimeter case expands or contracts the aneroid barometer. This movement is transmitted through mechanical linkage to rotate the pointers.
Task Number 73

Interpret information on a Horizontal Situation Indicator (HSI).

Definition

Interpretation should include the following:

- The heading indicator is located below the artificial horizon and is normally modeled after an HSI.
- As in the case of the attitude indicator, the heading indicator receives its information from the magnetometer, which feeds information to the attitude and heading reference system (AHRS) unit and then out to the primary flight display (PFD).

PLT056

Task Number 74

Interpret readings on a turn-and-slip indicator.

Definition

Interpretation should include the following:

- The slip/skid indicator is the horizontal line below the roll pointer.
- Like a ball in a turn-and-slip indicator, a bar width off center is equal to one ball width displacement.
- The turn-rate indicator is typically found directly above the rotating compass card.
- Tick marks to the left and right of the lubber line denote the turn (standard rate versus half-standard rate).
- Typically denoted by a trend line, if the trend vector is extended to the second tick mark, the aircraft is in a standard-rate turn.

PLT086

Task Number 75

Define terms related to airspeed.
Definition
Definitions should include the following:

- *Equivalent airspeed (EAS)* — the ASI reading corrected for position (or installation), for instrument error, and for adiabatic compressible flow for the particular altitude
- *Velocity of normal operations (VNO)* — the maximum speed for normal operation or the maximum structural cruising speed. This is the speed at which exceeding the limit load factor may cause permanent deformation of the aircraft structure.
- *Velocity to never exceed (VNE)* — the speed that should never be exceeded; if flight is attempted above this speed, structural damage or structural failure may result.

PLT035

Task Number 76
Describe indicating systems.

Definition
Description should include the following:

- Airspeed
- AOA
- Altitude
- Heading
- Manifold pressure
- Synchro
- Exhaust gas temperature (EGT)

A pilot understands how each instrument works and recognizes when an instrument is malfunctioning. He or she can safely utilize the instruments to their fullest potential.

PLT278

Task Number 77
Interpret speed indicator readings.

Definition
Interpretation should include the following:
• Aircraft weighing 12,500 pounds or less, manufactured after 1945, and certificated by the Federal Aviation Administration (FAA) are required to have airspeed indicators (ASI) marked in accordance with a standard color-coded marking system.
• This system of color-coded markings enables a pilot to determine at a glance certain airspeed limitations that are important to the safe operation of the aircraft.

PLT088

Task Number 78

Explain the effect of temperature changes on the altimeter.

Definition

Explanation should include the following:

• When the air is warmer than standard, the aircraft is higher than the altimeter indicates; when the air is cooler than standard, the aircraft is lower than the altimeter indicates.
• Altitude corrections for temperature can be computed on the navigation computer.

PLT165

Task Number 79

Describe altimeter settings and setting procedures.

Definition

Description should include the following:

• Most altimeters are equipped with a barometric pressure setting window (or Kollsman window) providing a means to adjust the altimeter. A knob is located at the bottom of the instrument for this adjustment.
• To adjust the altimeter for variation in atmospheric pressure, the pressure scale in the altimeter setting window, calibrated in inches of mercury ("Hg) and/or millibars (mb), is adjusted to match the given altimeter setting.
• Altimeter setting is defined as station pressure reduced to sea level, but an altimeter setting is accurate only in the vicinity of the reporting station.

PLT166
Task Number 80

**Explain the importance of accurate altimeters.**

**Definition**

Explanation should include the following:

- The pilot must be sure that the aircraft is flying high enough to clear the highest terrain or obstruction along the intended route.
- It is especially important to have accurate altitude information when visibility is restricted.

PLT167

Task Number 81

**Explain airspeed as it relates to aircraft performance.**

**Definition**

Explanation should include the following:

- The maximum-level flight speed for the aircraft is obtained when the power or thrust required equals the maximum power or thrust available from the powerplant.
- The minimum-level flight airspeed is not usually defined by thrust or power requirement since conditions of stall or stability and control problems generally predominate.

PLT123

Task Number 82

**Describe the operation of a propeller.**

**Definition**

Description should include the following:

- The propeller is a rotating airfoil, subject to induced drag, stalls, and other aerodynamic principles that apply to any airfoil.
- It provides the necessary thrust to pull or, in some cases, push the aircraft through the air.
• The propeller itself is twisted, so the blade angle changes from hub to tip. The greatest angle of incidence, or the highest pitch, is at the hub while the smallest angle of incidence or smallest pitch is at the tip.

PLT350

Task Number 83

Describe fixed-pitch propellers.

Definition

Description should include the following:

• A propeller with fixed blade angles is a fixed-pitch propeller.
• The pitch of this propeller is set by the manufacturer and cannot be changed.
• Since a fixed-pitch propeller achieves the best efficiency only at a given combination of airspeed and revolutions per minute (rpm), the pitch setting is ideal for neither cruise nor climb.
• It is a propeller with blades whose pitch can be adjusted on the ground with the engine not running, but which cannot be adjusted in flight.

PLT351

Task Number 84

Describe V-speeds.

Definition

Description should include the following:

• $V_{S0}$ (velocity stall 0)—the calibrated power-off stalling speed or the minimum steady flight speed at which the aircraft is controllable in the landing configuration
• $V_{S1}$ (velocity stall 1)—the calibrated power-off stalling speed or the minimum steady flight speed at which the aircraft is controllable in a specified configuration
• $V_Y$ (best rate of climb)—the speed at which the aircraft obtains the maximum increase in altitude per unit of time; this best ROC speed normally decreases slightly with altitude.
• $V_X$ (best angle of climb)—the speed at which the aircraft obtains the highest altitude in a given horizontal distance; this best AOC speed normally increases slightly with altitude.
- \( V_{LE} \) (velocity with landing gear extended)—the maximum speed at which the aircraft can be safely flown with the landing gear extended; this is a problem involving stability and controllability.
- \( V_{LO} \) (velocity for landing gear operation)—the maximum speed at which the landing gear can be safely extended or retracted; this is a problem involving the air loads imposed on the operating mechanism during extension or retraction of the gear.
- \( V_{FE} \) (velocity with flaps extended)—the highest speed permissible with the wing flaps in a prescribed extended position; this is because of the air loads imposed on the structure of the flaps.
- \( V_{A} \) (velocity of acceleration—the calibrated design maneuvering airspeed; this is the maximum speed at which the limit load can be imposed (either by gusts or full deflection of the control surfaces) without causing structural damage.
- \( V_{NO} \) (velocity of normal operations)—the maximum speed for normal operation or the maximum structural cruising speed; this is the speed at which exceeding the limit load factor may cause permanent deformation of the aircraft structure.
- \( V_{NE} \) (velocity to never exceed)—the speed that should never be exceeded; if flight is attempted above this speed, structural damage or structural failure may result.

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**Task Number 85**

**Explain the use of turn-and-slip indicators and turn coordinators in basic instrument flying.**

**Definition**

Explanation should include the following:

- Aircraft use two types of turn indicators—turn-and-slip indicators and turn coordinators.
- Because of the way the gyro is mounted, the turn-and-slip indicator shows only the rate of turn in degrees per second.
- The turn coordinator is mounted at an angle, or canted, so it can initially show roll rate. When the roll stabilizes, it indicates rate of turn.
- Both instruments indicate turn direction and quality (coordination), and also serve as a backup source of bank information in the event an attitude indicator fails.
- Coordination is achieved by referring to the inclinometer, which consists of a liquid-filled curved tube with a ball inside.
- The turn-and-slip indicator uses a pointer, called the turn needle, to show the direction and rate of turn.
Task Number 86

Explain the operation of a magnetic compass.

Definition

Explanation should include the following:

- A magnet is a piece of material, usually a metal containing iron, that attracts and holds lines of magnetic flux.
- Regardless of size, every magnet has two poles—north and south.
- When one magnet is placed in the field of another, the unlike poles attract each other, and like poles repel.

PLT215

Task Number 87

Describe the pitot-static system.

Definition

Description should include the following:

- The pitot-static system is a combined system that utilizes the static air pressure and the dynamic pressure due to the motion of the aircraft through the air.
- These combined pressures are utilized for the operation of the airspeed indicator (ASI), altimeter, and vertical speed indicator (VSI).

PLT337

Task Number 88

Describe an aircraft's pneumatic system.

Definition

Description should include the following:

- In some aircraft, all the gyros are vacuum-, pressure-, or electrically operated.
In other aircraft, vacuum or pressure systems provide the power for the heading and attitude indicators, while the electrical system provides the power for the turn coordinator.

Most aircraft have at least two sources of power to ensure at least one source of bank information is available if one power source fails.

**Task Number 89**

**Explain the effects of carburetor heat.**

**Definition**

Explanation should include the following:

- Carburetor heat can be used to melt ice that has already formed in the carburetor if the accumulation is not too great, but using carburetor heat as a preventative measure is the better option.
- It may also be used as an alternate air source if the intake filter clogs, such as in sudden or unexpected airframe icing conditions. The carburetor heat should be checked during the engine run-up.

**Task Number 90**

**Describe factors that cause carburetor ice.**

**Definition**

Description should include the following:

- If water vapor in the air condenses when the carburetor temperature is at or below freezing, ice may form on internal surfaces of the carburetor, including the throttle valve. This restricts the flow of the fuel-air mixture and reduces power.
- If enough ice builds up, the engine may cease to operate.
Describe effects of carburetor ice.

Definition

Description should include the following:

- The first indication of carburetor icing in an aircraft with a fixed-pitch propeller is a decrease in engine rpm, which may be followed by engine roughness.
- In an aircraft with a constant-speed propeller, carburetor icing is usually indicated by a decrease in manifold pressure, but no reduction in rpm. Propeller pitch is automatically adjusted to compensate for loss of power. Thus, a constant rpm is maintained.

Task Number 92

Describe the reciprocating engine.

Definition

Description should include the concept that the name *reciprocating engine* is derived from the back-and-forth, or reciprocating, movement of the pistons that produce the mechanical energy necessary to accomplish work.

Task Number 93

Explain the process of controlling engine temperature.

Definition

Explanation should include the following:

- The oil system is vital to the internal cooling of the engine.
- An additional method of cooling is necessary for the engine’s external surface. Most small aircraft are air cooled, although some are liquid cooled.
Task Number 94

Explain powerplant operation.

Definition

Explanation should include the following:

- An aircraft engine, or powerplant, produces thrust to propel an aircraft.
- Reciprocating engines and turboprop engines work in combination with a propeller to produce thrust.
- Turbojet and turbofan engines produce thrust by increasing the velocity of air flowing through the engine.
- All of these powerplants also drive the various systems that support the operation of an aircraft.

Task Number 95

Explain turbine engine operation.

Definition

Explanation should include the following:

- Air inlet
- Compressor
- Combustion chambers
- Turbine section
- Exhaust

Turbine engines are highly desirable aircraft powerplants. They are characterized by smooth operation and a high power-to-weight ratio, and they use readily available jet fuel.

Task Number 96

Explain turboprop engine operation.
Definition

Explanation should include the following:

- The turboprop engine consists of four sections.
  - The compressor section passes inlet air at a high rate of speed.
  - The combustion chamber contains the fuel inlet and igniter for combustion.
  - The expanding air drives a turbine, which is connected by a shaft to the compressor, sustaining engine operation.
  - The accelerated exhaust gases from the engine provide thrust.
- This is a basic application of compressing air, igniting the fuel-air mixture, producing power to self-sustain the engine operation, and exhaust for propulsion.

Task Number 97

Describe the fuel system.

Definition

Description should include the following:

- Storage tanks
- Pumps
- Filters
- Valves
- Fuel lines
- Metering devices
- Monitoring devices

Fuel systems are designed and certified under strict Title 14 of the Code of Federal Regulations (14 CFR) guidelines. Each system must provide an uninterrupted flow of contaminant-free fuel regardless of the aircraft's attitude.

Task Number 98

Describe aircraft fuel.

Definition
Description should include the following:

- Aviation gasoline (AVGAS) is identified by an octane or performance number (grade), which designates the antiknock value or knock resistance of the fuel mixture in the engine cylinder.
- The higher the grade of gasoline, the more pressure the fuel can withstand without detonating.
- Lower grades of fuel are used in lower-compression engines, because these fuels ignite at lower temperatures.
- Higher grades are used in higher-compression engines because they ignite at higher temperatures, but not prematurely.
- If the proper grade of fuel is not available, use the next higher grade as a substitute. Never use a grade lower than recommended.

PLT130

**Task Number 99**

**Describe detonation in aircraft engines.**

**Definition**

Description should include the following:

- Detonation is an uncontrolled, explosive ignition of the fuel-air mixture within the cylinder’s combustion chamber.
- It causes excessive temperatures and pressures which, if not corrected, can quickly lead to failure of the piston, cylinder, or valves.

PLT115

**Task Number 100**

**Describe the fuel-air mixture.**

**Definition**

Description should include the following:

- The intake stroke begins as the piston starts its downward travel. When this happens, the intake valve opens and the fuel-air mixture is drawn into the cylinder.
• The intake, compression, power, and exhaust processes occur in four separate strokes of the piston.

PLT249

Task Number 101

Describe precautions related to aircraft fuel.

Definition

Description should include the following:

• Care must be exercised to ensure that the correct aviation grade is being used for the specific type of engine.
• In addition to the color of the fuel itself, the color-coding system extends to decals and various airport fuel-handling equipment.
• Accidents attributed to powerplant failure from fuel contamination have often been traced to
  o inadequate preflight inspection by the pilot
  o servicing aircraft with improperly filtered fuel from small tanks or drums
  o storing aircraft with partially filled fuel tanks
  o lack of proper maintenance.

PLT250

Task Number 102

Describe fuel additives.

Definition

Description should include the following:

• The use of anti-icing additives for some aircraft has been approved as a means of preventing problems with water and ice in AVGAS.
• Some laboratory and flight testing indicates that the use of hexylene glycol, certain methanol derivatives, and ethylene glycol mononethyl ether (EGME) in small concentrations inhibit fuel system icing. These tests indicate that the use of EGME at a maximum 0.15 percent by volume concentration substantially inhibits fuel system icing under most operating conditions.
Task Number 103

Explain the fuel-dump system.

Definition

Explanation should include the following:

- If an aircraft’s design landing weight is less than that of the maximum takeoff weight, a situation could occur in which a landing is desired before sufficient fuel has burned off to lighten the aircraft.
- Fuel jettisoning systems are required on these aircraft so that fuel can be jettisoned in flight to avoid structural damage caused by landing the aircraft when it is too heavy.
- Fuel jettisoning systems are also referred to as fuel-dump systems.

Task Number 104

Describe concerns related to fuel system malfunctions and leaks.

Definition

Description should include the fact that the danger of fire, explosion, or fuel starvation in flight makes it imperative that fuel system irregularities be given top priority.

Task Number 105

Describe fuel-load concerns.

Definition

Description should include the following:
• Varying fuel loads and shifts in weight during maneuvers must not negatively affect control of the aircraft in flight.
• Fuel load requires a sufficiently strong airframe design.

PLT255

Task Number 106
Describe the fire-extinguishing system.
Definition
Description should include the following:
• The following minimum number of hand fire extinguishers must be conveniently located and evenly distributed in passenger compartments:
  o At least one hand fire extinguisher must be conveniently located in the pilot compartment.
  o At least one hand fire extinguisher must be located in, or readily accessible for use in, each galley located above or below the passenger compartment.
• Each hand fire extinguisher must be approved.

PLT212

Task Number 107
Describe aircraft landing gear.
Definition
Description should include the following:
• The landing gear on small aircraft consists of three wheels—two main wheels (one located on each side of the fuselage) and a third wheel positioned either at the front or rear of the airplane.
• Landing gear employing a rear-mounted wheel is called conventional landing gear.
• Airplanes with conventional landing gear are often referred to as tailwheel airplanes.
• When the third wheel is located on the nose, it is called a nosewheel, and the design is referred to as a tricycle gear.
• A steerable nosewheel or tailwheel permits the airplane to be controlled throughout all operations while on the ground.
• Landing gear can also be classified as either fixed or retractable.
o Fixed landing gear always remains extended and has the advantage of simplicity combined with low maintenance.

o Retractable landing gear is designed to streamline the airplane by allowing the landing gear to be stowed inside the structure during cruising flight.

PLT138

Task Number 108

Describe the aircraft brake system.

Definition

Description should include the following:

- Airplane brakes are located on the main wheels and are applied by either a hand control or by foot pedals (toe or heel).
- Foot pedals operate independently and allow for differential braking.
- During ground operations, differential braking can supplement nosewheel and tailwheel steering.

PLT110

Task Number 109

Describe aircraft circuitry.

Definition

Description should include the concept that any circuit that includes a switch (or other control or measuring indicator) is a series circuit.

PLT111

Task Number 110

Describe the aircraft electrical system.

Definition
Description should include the following:

- Most aircraft are equipped with either a 14- or a 28-volt direct current (DC) electrical system.
- A basic aircraft electrical system consists of the following components:
  - Alternator/generator
  - Battery
  - Master/battery switch
  - Alternator/generator switch
  - Bus bar, fuses, and circuit breakers
  - Voltage regulator
  - Ammeter/loadmeter
  - Associated electrical wiring
- Engine-driven alternators or generators supply electric current to the electrical system. They also maintain a sufficient electrical charge in the battery.
- Electrical energy stored in a battery provides a source of electrical power for starting the engine and a limited supply of electrical power for use in the event the alternator or generator fails.

PLT107

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Task Number 111

Describe aircraft batteries.

Definition

Description should include the following:

- Many aircraft are equipped with a battery switch that controls the electrical power to the aircraft in a manner similar to the master switch.
- An alternator switch is installed that permits the pilot to exclude the alternator from the electrical system in the event of alternator failure.

PLT109

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Task Number 112

Identify equipment that depends on the electrical system.

Definition
Identification should include the following:

- Position lights
- Anti-collision lights
- Landing lights
- Taxi lights
- Interior cabin lights
- Instrument lights
- Radio equipment
- Turn indicator
- Fuel gauges

PLT207

Task Number 113

Explain the aircraft pressurization system.

Definition

Explanation should include the following:

- A cabin pressurization system typically maintains a cabin pressure altitude of approximately 8,000 feet at the maximum designed cruising altitude of an aircraft.
- This prevents rapid changes of cabin pressure altitude that may be uncomfortable or cause injury to passengers and crew.
- The pressurization system permits a reasonably fast exchange of air from the inside to the outside of the cabin.

PLT135

Task Number 114

Describe anti-icing and de-icing.

Definition

Description should include the following:

- De-icing is the process of removing snow, ice, or frost from a surface.
• Anti-icing is understood to be the application of chemicals that not only de-ice but also remain on a surface and continue to delay the reformation of ice for a certain period of time or prevent adhesion of ice to make mechanical removal easier.

PLT136

Task Number 115

Explain environmental control in aircraft.

Definition

Explanation should include the following:

• Bleed air heating systems are used on turbine-engine aircraft.
• Extremely hot compressor bleed air is ducted into a chamber where it is mixed with ambient or re-circulated air to cool the air to a useable temperature.
• The air mixture is then ducted into the cabin.
• This type of system contains several safety features to include
  o temperature sensors that prevent excessive heat from entering the cabin
  o check valves to prevent a loss of compressor bleed air when starting the engine and when full power is required
  o engine sensors to eliminate the bleed system if the engine becomes inoperative.

PLT137

Task Number 116

Explain the oil system.

Definition

Explanation should include the following functions of the oil system:

• Lubricating the engine’s moving parts
• Cooling the engine by reducing friction
• Removing heat from the cylinders
• Providing a seal between the cylinder walls and pistons
• Carrying away contaminants

PLT324
Task Number 117

Explain hydraulic systems.

Definition

Explanation should include the following components of a basic hydraulic system:

- Reservoir
- Pump (hand, electric, or engine-driven)
- Filter to keep the fluid clean
- Selector valve to control the direction of flow
- Relief valve to relieve excess pressure
- Actuator

PLT273

Task Number 118

Describe fuel tanks.

Definition

Description should include the following:

- The fuel tanks, normally located inside the wings of an airplane, have a filler opening on top of the wing through which they can be filled. A filler cap covers this opening.
- The tanks are vented to the outside to maintain atmospheric pressure inside the tank.
- They may be vented through the filler cap or through a tube extending through the surface of the wing.
- Fuel tanks also include an overflow drain that may stand alone or be collocated with the fuel tank vent. This allows fuel to expand with increases in temperature without damage to the tank itself.

PLT254

Understanding Airport Operations
Task Number 119

Describe airport landing indicators.

Definition

Description should include the following:

- Approach light systems are primarily intended to provide a means to transition from instrument flight to visual flight for landing. The system configuration depends on whether the runway is a precision or non-precision instrument runway.
- Some systems include sequenced flashing lights that appear to the pilot as a ball of light traveling toward the runway at high speed.
- Approach lights can also aid pilots operating under visual flight rules (VFR) at night.
- Visual glideslope indicators provide the pilot with glidepath information that can be used for day or night approaches. By maintaining the proper glidepath as provided by the system, a pilot should have adequate obstacle clearance and should touch down within a specified portion of the runway.

PLT039

Task Number 120

Describe information on an airport diagram.

Definition

Description should include the following:

- When a pilot flies into a different airport, it is important to review the current data for that airport.
- This data provides the pilot with information, such as communication frequencies, services available, closed runways, or airport construction.

PLT077

Task Number 121

Describe land and hold short operations (LAHSO).

Definition
Description should include the following:

- Land and hold short operations is an air traffic control (ATC) procedure that may require an aircraft to land and hold short of an intersecting runway or point on a runway.
- If issued a land and hold short clearance, the pilot must be aware of the reduced runway distances and whether or not he or she can comply before accepting the clearance.
- Pilots should only receive a LAHSO clearance when there is a minimum ceiling of 1,000 feet and three statute miles of visibility.

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**Task Number 122**

**Describe airport markings, signs, and lighting.**

**Definition**

Description should include the fact that all airport markings are painted on the surface, whereas some signs are vertical and some are painted on the surface.

PLT141

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**Task Number 123**

**Explain noise-avoidance routes.**

**Definition**

Explanation should include the fact that, for safety and quality of life, the FAA can prohibit aircraft from flying over residential areas, including schools and churches.

PLT142

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**Task Number 124**

**Identify rescue and firefighting vehicles and firefighting agents.**

**Definition**
Identification should include the following:

- An airport crash tender (known in some countries as an airport fire appliance) is a specialized fire engine designed for use in aircraft rescue at airfields and military air bases.
- Agents include chemical agents and firefighting foam.

Task Number 125

Describe runway conditions.

Definition

Description should include the following:

- Runway conditions affect takeoff and landing performance.
- Typically, performance chart information assumes paved, level, smooth, and dry runway surfaces.
- Obstructions such as mud, snow, or standing water reduce the airplane's acceleration down the runway.

Task Number 126

Describe runway lighting.

Definition

Description should include the following:

- Runway end identifier lights (REIL)
- Runway edge lights
- Runway centerline lighting systems (RCLS)

Task Number 127
Describe traffic pattern procedures and communication procedures.

Definition

Description should include the following:

- At most airports and military air bases, traffic pattern altitudes for propeller-driven aircraft generally extend from 600 feet to as high as 1,500 feet above ground level (AGL). Pilots can obtain the traffic pattern altitude for an airport from the U.S. Chart Supplement (formerly Airport/Facility Directory).
- At airports without an operating control tower, a segmented circle visual indicator system, if installed, is designed to provide traffic pattern information. It is usually located in a position affording maximum visibility to pilots in the air and on the ground and providing a centralized location for other elements of the system.

Task Number 128

Describe visual glide path indicators.

Definition

Description should include the following:

- Visual glideslope indicators provide the pilot with glide path information that can be used for day or night approaches.
- By maintaining the proper glide path as provided by the system, a pilot should have adequate obstacle clearance and should touch down within a specified portion of the runway.

Task Number 129

Describe airport operations lighting.

Definition

Description should include the following:
- Medium Approach Lighting System (MALS)
- Approach Lighting System with Sequence Flashing (ALSF)
- Runway Centerline Lighting System (RCLS)
- Touchdown Zone Lighting (TDZL)

PLT148

**Task Number 130**

**Describe taxi operations and procedures.**

**Definition**

Description should include the following:

- Thorough planning is essential for safe taxi operations.
- Pilots should give as much attention to planning the airport surface movement of the flight as is given to other phases of flight.

PLT149

**Task Number 131**

**Describe airport traffic entry patterns.**

**Definition**

Description should include that the pilot should enter pattern in level flight, abeam the midpoint of the runway, at pattern altitude. (1,000' AGL is recommended pattern altitude unless otherwise established.)

PLT150

**Task Number 132**

**Describe aircraft lighting.**

**Definition**

Description should include the following:
• Aircraft position lights are required to be lighted on aircraft operated on the surface and in flight from sunset to sunrise.
• Aircraft equipped with an anti-collision light system are required to operate that light system during all types of operations (day and night).

Task Number 133

Describe automatic terminal information service (ATIS) broadcasts.

Definition

Description should include the following:

• ATIS is a continuous broadcast of recorded aeronautical information in busier terminal areas.
• ATIS broadcasts contain essential information, such as current weather information, active runways, available approaches, and any other information required by the pilots, such as important notices to airmen (NOTAMs).
• Pilots usually listen to an available ATIS broadcast before contacting the local control unit, which reduces the controllers’ workload and relieves frequency congestion.

Task Number 134

Describe visual flight rules (VFR).

Definition

Description should include the concept that VFR are a set of regulations under which a pilot operates an aircraft in weather conditions generally clear enough to allow the pilot to see where the aircraft is going.

Task Number 135
Describe visual meteorological conditions (VMC).

**Definition**

Description should include the concept that VMC is an aviation flight category in which VFR flight is permitted—that is, conditions in which pilots have sufficient visibility to fly the aircraft maintaining visual separation from terrain and other aircraft.

PLT468

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**Task Number 136**

**Interpret airspace classes.**

**Definition**

Interpretation should include the following:

- The airspace system in the United States is categorized by letter classifications from A through G, with the omission of F (which does not exist in the U.S.).
- These classes of airspace are logically arranged with regard to the conditions each pilot must meet to legally operate an aircraft in each airspace class.
- These requirements increase gradationally, with Class G airspace being the least restrictive, to Class A airspace, the most restrictive airspace.

PLT040

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**Task Number 137**

**Describe operational airspace requirements.**

**Definition**

Description should include the following:

- Air traffic control (ATC) is responsible for ensuring that the necessary coordination has been accomplished before allowing an aircraft under their control to enter another controller’s area of jurisdiction.
- Before issuing control instructions directly or relaying through another source to an aircraft that is within another controller’s area of jurisdiction that will change that aircraft’s heading, route, speed, or altitude, ATC ensures that coordination has been
accomplished with each of the controllers listed below whose area of jurisdiction is affected by those instructions, unless otherwise specified by a letter of agreement or a facility directive:

- The controller within whose area of jurisdiction the control instructions are issued
- The controller receiving the transfer of control
- Any intervening controller(s) through whose area of jurisdiction the aircraft will pass

PLT162

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Task Number 138

Interpret ATC communications.

Definition

Interpretation should include the concept that monitoring radio communications for traffic, weather discussion, and ATC communication can enhance situational awareness by helping the pilot develop a mental picture of what is happening.

PLT044

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Task Number 139

Describe satellite radio navigation systems (RNAV).

Definition

Description should include the following:

- The GPS is a satellite-based RNAV.
- Development of the system is underway so that GPS is capable of providing the primary means of electronic navigation. Portable and yoke-mounted units are proving to be very popular in addition to those permanently installed in the aircraft. Extensive navigation databases are common features in aircraft GPS receivers.

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Task Number 140

Describe the HSI.
Definition

Description should include the following:

- The heading indicator is located below the artificial horizon and is normally modeled after an HSI.
- As in the case of the attitude indicator, the heading indicator receives its information from the magnetometer, which feeds information to the attitude and heading reference system (AHRS) unit and then out to the primary flight display (PFD) selected navigation facility or fix. They also provide pilotage information so the aircraft can be maneuvered to keep it on a predetermined path.
- The pilotage information can be in either two or three dimensions relative to the ground-based or space-based navigation information.

PLT355; PLT356

Task Number 141

Describe an instrument landing system (ILS).

Definition

Description should include the concept that an ILS enables pilots to conduct an instrument approach to landing if they are unable to establish visual contact with the runway.

PLT357

Task Number 142

Describe the very-high frequency (VHF) omnidirectional range navigation system (VOR).

Definition

Description should include the following:

- The VHF omnidirectional range navigation system, VOR, was probably the most significant aviation invention other than the jet engine.
- With it, a pilot can simply, accurately, and without ambiguity navigate from point A to point B.
Task Number 143

Describe license requirements.

Definition

Description should include the following certifications:

- Pilots
- Flight instructors
- Ground instructors

(See 14 CFR Part 61.)

Exploring Regulations

Task Number 144

Describe pilot deviation reports.

Definition

Description should include that pilot deviation reports are used to document other incidents that are violations of the federal aviation regulations and create an unsafe situation.

Task Number 145

Describe regulations and equipment and operating requirements related to large transport aircraft.
Definition

Description should include the following:

- Large aircraft—an aircraft of more than 12,500 pounds, maximum certificated takeoff weight
- Light-sport aircraft (LSA)—an aircraft, other than a helicopter or powered-lift that, since its original certification, has continued to meet the definition in 14 CFR 1.1; can include airplanes, airships, balloons, gliders, gyro planes, powered parachutes, and weight-shift-control
- Small aircraft—aircraft of 12,500 pounds or less, maximum certificated takeoff weight

Task Number 146

Identify regulations related to admission to flight deck.

Definition

Identification should include the concept that no person may admit any person to the flight deck of an aircraft unless the person being admitted is

- crewmember
- FAA air carrier inspector, a Department of Defense (DOD) commercial air carrier evaluator, or an authorized representative of the National Transportation Safety Board, who is performing official duties
- any person who has permission of the pilot in command, an appropriate management official of the part 119 certificate holder, and the administrator.

Task Number 147

Define aerobatic flight in accordance with the FAA.

Definition

Definition should include the following:
According to the FAA (FAR 91.303), *aerobatic flight* is defined as “an intentional maneuver involving an abrupt change in an aircraft’s attitude, an abnormal attitude, or abnormal acceleration, not necessary for normal flight.”

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**Task Number 148**

**Describe ATC clearances.**

**Definition**

Description should include the following:

- Title 14 of the Code of Federal Regulations (14 CFR) part 91, section 91.123 requires pilots to follow all ATC clearances and instructions.
- A pilot should request clarification if unsure of the clearance or instruction to be followed.

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**Task Number 149**

**Describe the FAA aircraft classification category.**

**Definition**

Description should include the following:

- The FAA uses various ways to classify or group machines operated or flown in the air.
- The most general grouping uses the term *aircraft*. This term is in 14 CFR 1.1 and means a device that is used, or intended to be used, for flight in the air.

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**Task Number 150**

**Describe aircraft inspection regulations.**

**Definition**
Description should include the following:

- Under 14 CFR part 91, the primary responsibility for maintaining an aircraft in an airworthy condition falls on the owner or operator of the aircraft.
- Certain inspections must be performed on the aircraft, and the owner must maintain the airworthiness of the aircraft during the time between required inspections by having any defects corrected.

PLT372

Task Number 151

Describe aircraft operating limitations.

Definition

Description should include the following:

- An airplane flight manual (AFM) contains the operating procedures and limitations of that aircraft.
- Title 14 CFR part 91 requires that pilots comply with the operating limitations specified in the approved flight manuals, markings, and placards.

PLT373

Task Number 152

Describe the responsibilities of aircraft owners and operators.

Definition

Description should include the following:

- Aircraft owners are responsible for immediately notifying FAA Aircraft Registration (AFS-750) of any change of permanent mailing address, the sale or export of your aircraft, or the loss of ability to register an aircraft in accordance with 14 CFR part 47, section 47.41.
- Aircraft owners are responsible for compliance and familiarity with the applicable 14 CFR part(s) concerning the operation and maintenance of aircraft.
Task Number 153

Describe aircraft return-to-service regulations.

Definition

Description should include the following:

- Information on the aircraft certification process, aircraft safety information, and guidance on general aviation aircraft
- Certification of aircraft by the FAA ensures that commercial and general aviation aircraft meet the highest safety standards.

PLT375

Task Number 154

Explain special-use airspace.

Definition

Explanation should include the following:

- Special-use airspace (SUA) is an area designated for operations of a nature such that limitations may be imposed on aircraft not participating in those operations. Often these operations are of a military nature.
- The designation of SUAs identifies for other users the areas where such activity occurs, provides for segregation of that activity from other users, and allows charting to keep airspace users informed of potential hazards.
- Most SUAs are depicted on aeronautical charts and FAA maintains a page showing the current status of most SUAs.

PLT376

Task Number 155

Explain airworthiness.

Definition
Explanation should include the following:

- When the aircraft is complete, with the airframe, engine, and propeller, it is inspected and the FAA issues an airworthiness certificate for the aircraft.
- Having an airworthiness certificate means the complete aircraft meets the design and manufacturing standards, and is in a condition for safe flight.
- This airworthiness certificate must be carried in the aircraft during all flight operations.
- The airworthiness certificate remains valid as long as the required maintenance and inspections are kept up to date for the aircraft.

Task Number 156

Describe airworthiness directives.

Definition

Description should include the concept that airworthiness directives (ADs) are legally enforceable regulations issued by the FAA in accordance with 14 CFR, part 39, to correct an unsafe condition in a product.

Task Number 157

Describe regulations related to alternate airport requirements.

Definition

Description should include the concept that no person may begin a flight in an airplane under VFR conditions unless (considering wind and forecast weather conditions) there is enough fuel to fly to the first point of intended landing, assuming normal cruising speed.

Task Number 158

Describe alternate airport requirements related to weather.
Definition

Description should include the concept that no person may list an airport as an alternate airport in the dispatch or flight release unless the appropriate weather reports or forecasts, or any combination thereof, indicate that the weather conditions will be at or above the alternate weather minimums specified in the certificate holder’s operations specifications for that airport when the flight arrives.

PLT380

Task Number 159

Describe altimeter settings.

Definition

Description should include the concept that most altimeters are equipped with a barometric pressure setting window (or Kollsman window) providing a means to adjust the altimeter. A knob is located at the bottom of the instrument for this adjustment.

PLT381

Task Number 160

Describe approach minima.

Definition

Description should include the following:

- A precision approach is an instrument approach and landing using precision lateral and vertical guidance with minima, as determined by the category of operation.
- Computer-generated navigation data is displayed to the pilot of an aircraft.

PLT382

Task Number 161

Explain basic flight rules.
Definition

Explanation should include the following:

- A part 91 operator has regulations defined by the FAA for operations of small non-commercial aircraft within the United States (although, many other countries defer to these rules as well).
- These regulations set conditions in which the aircraft may operate, such as weather.

Definition

Task Number 162

Describe briefing of passengers.

Definition

Description should include the concept that before each takeoff, the pilot in command of an airplane carrying passengers shall ensure that all passengers have been orally briefed on the following:

- Smoking—Each passenger shall be briefed on when, where, and under what conditions smoking is prohibited.
- Use of safety belts and shoulder harnesses—Regulations require passenger compliance with the lighted passenger sign and/or crewmember instructions with regard to these items.
- Location and means for opening the passenger entry door and emergency exits
- Location of survival equipment
- Ditching procedures and the use of flotation equipment required under § 91.509 for a flight over water
- The normal and emergency use of oxygen equipment installed on the airplane

Task Number 163

Describe regulations related to cargo in the passenger compartment.

Definition
Description should include the following from § 121.285:

- Carriage of cargo in passenger compartments
- Except as provided in paragraph (b), (c), or (d) of this section, no certificate holder may carry cargo in the passenger compartment of an airplane.

Task Number 164

Describe certificate issuance and renewal.

Definition

Description should include the following:

- Application for an original certificate or renewal of a certificate issued under this part is made on a form, and in a manner, prescribed by the administrator.
- The form may be obtained from an FAA Flight Standards District Office.

Task Number 165

Describe change-of-address regulations.

Definition

Description should include the following:

- In accordance with the CFA, FAA certificate holders are required to update their mailing address within 30 days of obtaining a new address.

Task Number 166

Describe regulations related to cockpit voice and flight data recorders.
Definition

Description should include the following:

- **121.359(d):** No person may operate a multiengine, turbine-powered airplane having a passenger seat configuration of 10-19 seats unless it is equipped with an approved cockpit voice recorder. This is required for
  - large 4-engined turbine-powered planes
  - large 4-engined pressurized planes
  - multi-engined turbine-powered planes seating 10 or more passengers
  - multi-engined turbine-powered rotorcraft seating 20 or more passengers
  - multi-engined turbine-powered planes and rotorcraft seating six or more passengers and requiring two pilots.
- Relevant regulations include 14 CFR 121.359 and 14 CFR 125.227.

PLT388

Task Number 167

Describe commercial operation requirements and conditions (OpSpecs).

Definition

Description should include the concept that a commercial pilot may

- fly as a part 91 “corporate pilot,” flying a company airplane carrying company property and passengers
- provide part 91 “pilot service,” paid by an airplane owner to fly the airplane for the owner and guests
- provide “private carriage” for hire for one customer or a few select customers.

PLT389

Task Number 168

Explain regulations related to communications en route.

Definition

Explanation should include the following:
Radio communications are a critical link in the ATC system. The link can be a strong bond between pilot and controller or it can be broken with surprising speed and disastrous results.

A position report is required by all flights regardless of altitude, including those operating in accordance with an ATC clearance specifying "VFR-on-top," over each designated compulsory reporting point along the route being flown.

When flying into airspace that is under the authority of ATC, two-way radio communication is mandatory unless prior arrangements have been made.

When a pilot receives instruction from ATC, the pilot must comply, as long as compliance does not violate regulations or create an unsafe condition. If the pilot cannot comply with instructions from ATC, the pilot must advise the controller as soon as possible.

Task Number 169

Describe procedures to remedy communications failure.

Definition

Description should include the following:

- Ensure the correct frequency has been set and the volume turned up.
- Check to ensure the mic is not stuck.
- Troubleshoot all connections (cords).
- If available, try an alternate frequency (FSS/ARINC). There is almost always a VHF frequency given for every UHF, one of them may not be monitored while the other is.
- There is no order or precedence for trying to contact ATC, including using guard; use all at once if necessary.
- If communications are established with an FSS or ARINC, the pilot should advise that radio communications on the previously assigned frequency has been lost, giving the aircraft's position, altitude, last assigned frequency and then request further clearance from the controlling facility.
- The preceding does not preclude the use of 121.5 MHz. There is no priority on which action should be attempted first.
- If the capability exists, do all at the same time.
- Aeronautical Radio, Incorporated (ARINC) is a commercial communications corporation which designs, constructs, operates, leases or otherwise engages in radio activities serving the aviation community. ARINC has the capability of relaying information to/from ATC facilities throughout the country.
  - Roll back to the last frequency used, if available to test.
  - Attempt another frequency; attempt guard.
  - Utilize VOR frequencies, if able.
If unable to re-establish communication with ATC, set the transponder, if equipped, to squawk 7600 for lost communications.

**Task Number 170**

**Explain compliance with local regulations.**

**Definition**

Explanation should include that, in addition to the FAR requirements, aircraft owners must comply with state, county, and local regulations.

**Task Number 171**

**Describe regulations and requirements related to controlled or restricted airspace.**

**Definition**

Description should include the following:

- The FAA, under 14 CFR § 99.7, Special Security Instructions (SSI), has prohibited all UAS flights within the airspace defined under UAS NOTAM FDC 7/7282. The restrictions extend from the ground up to 400 feet above ground level (AGL), apply to all types and purposes of UAS flight operations, and remain in effect 24 hours a day, 7 days a week.
- Special-use airspace is used to designate airspace in which certain activities must be confined, or where limitations may be imposed on aircraft operations that are not part of those activities. Types of special-use airspace include
  - prohibited areas
  - restricted areas
  - warning areas
  - military operation areas (MOAs)
  - alert areas
  - controlled firing areas (CFAs).
Task Number 172

Describe regulations related to declaration of an emergency.

Definition

Description should include the following:

- According to the FAA CFR Section 91.3 (b), "In an in-flight emergency requiring immediate action, the pilot in command may deviate from any rule of this part to the extent required to meet that emergency."
- Part 135 and 121 components of the Federal Aviation Regulations (FARs) have similar language to allow the pilot in command to do whatever it takes to address the emergency at hand.

PLT394

Task Number 173

Describe regulations related to destination airport visibility.

Definition

Description should include VFR: Visibility requirements. (a) No person may operate an airplane under VFR in uncontrolled airspace when the ceiling is less than 1,000 feet unless flight visibility is at least two miles. (b) No person may operate a helicopter under VFR in Class G airspace at an altitude of 1,200 feet or less above the surface or within the lateral boundaries of the surface areas of Class B, Class C, Class D, or Class E airspace designated for an airport unless the visibility is at least—(1) During the day—1/2 mile; or (2) At night—one mile.

PLT397

Task Number 174

Describe regulations related to dispatch.

Definition

Description should include the following:
• Flight Dispatchers are required to have comprehensive knowledge of various aviation disciplines, such as weight and balance, the air-traffic control system, meteorology, FARs, air navigation, and communications.
• The timely coordination and application of these disciplines by the dispatcher produce a safe, reliable, and economical flight-operations system.

Task Number 175

Describe regulations related to the display and inspection of licenses and certificates.

Definition

Description should include the following:

• An Airworthiness Certificate is issued by a representative of the FAA after the aircraft has been inspected, is found to meet the requirements of 14 CFR part 21, and is in condition for safe operation.
• The Airworthiness Certificate must be displayed in the aircraft so it is legible to the passengers and crew whenever it is operated.
• The Airworthiness Certificate must remain with the aircraft unless it is sold to a foreign purchaser.

Task Number 176

Identify documents to be carried on aircraft during flight.

Definition

Identification should include the following:

• A-R-R-O-W [91.203(a)(1), 91.293(a)(2), FCC, 91.9(b), 91.103, Aircraft Flight Manual]
• Airworthiness Certificate—91.203(a)(1) (must be displayed at cabin or cockpit entrance so it is legible to passengers and crew) The Airworthiness Certificate remains valid as long as the aircraft is maintained and operated as required by the FARs.
• Registration papers—91.203 (A temporary registration is not acceptable for international travel)
• Radio Station License—FCC Form 605 (not required within the U.S.; required outside the U.S.) This aircraft radio station license is good for 10 years but is not transferable if the aircraft is sold.
• Operating Limitations—91.9(b) and Aircraft Flight Manual (14 CFR 23.1581)
• Weight and balance data—91.103, 135.185 and Aircraft Flight Manual (14 CFR 23.1581)

PLT400

Task Number 177
Describe regulations related to dropping objects.

Definition

Description should include the following:

• No pilot in command of a civil aircraft may allow any object to be dropped from that aircraft in flight that creates a hazard to persons or property.
• However, this does not prohibit the dropping of any object if reasonable precautions are taken to avoid injury or damage to persons or property.
• Refer to Sec. 91.15, Dropping Objects, for more information.

PLT401

Task Number 178
Describe regulations related to emergency locator transmitters (ELT).

Definition

Description should include the following:

• An approved automatic emergency locator transmitter that is in operable condition, except that after June 21, 1995, an emergency locator transmitter that meets the requirements of TSO-C91 may not be used for new installations.
• Refer to Sec. 91.207, Emergency Locator Transmitters, for more information.
Task Number 179

Explain emergency deviation from regulations.

Definition

Explanation should include the following:

- In emergency conditions requiring immediate action for the protection of life or property, the certificate holder may deviate from any requirement of subpart D of this part, or the Airport Certification Manual, to the extent required to meet that emergency.
- Each certificate holder who deviates from a requirement under this section must, within 14 days after the emergency, notify the Regional Airports Division Manager in writing of the nature, extent, and duration of the deviation.
- Refer to Sec. 139.113, Deviations, for more information.

PLT403

Task Number 180

Describe regulations related to safety equipment.

Definition

Description should include the following:

- Each safety equipment control to be operated by the crew in emergency, such as controls for automatic life raft releases, must be plainly marked as to its method of operation.
- Each location, such as a locker or compartment, that carries any fire extinguishing, signaling, or other life saving equipment, must be so marked.
- Refer to Sec. 29.1561, Safety Equipment, for more information.

PLT404

Task Number 181

Describe regulations related to instruments and equipment.

Definition

Description should include the following:
• Unless otherwise specified, the instrument and equipment requirements of this subpart apply to all operations under this part.
• Instruments and equipment required by §121.305 through 121.359 and 121.803 must be approved and installed in accordance with the airworthiness requirements applicable to them.
• Each airspeed indicator must be calibrated in knots, and each airspeed limitation and item of related information in the aircraft flight manual and pertinent placards must be expressed in knots.

PLT405

Task Number 182
Describe regulations related to equipment failure.

Definition

Description should include the following:

• The administrator may issue a certificate of waiver authorizing the operation of aircraft in deviation from any rule listed in this subpart if the administrator finds that the proposed operation can be safely conducted under the terms of that certificate of waiver.
• An application for a certificate of waiver under this part is made on a form and in a manner prescribed by the administrator and may be submitted to any FAA office.
• A certificate of waiver is effective as specified in that certificate of waiver.
• Refer to Sec. 91.903, Policy and Procedures, for more information.

PLT406

Task Number 183
Describe regulations related to operating experience and training.

Definition

Description should included the following:

• No certificate holder may use any person, nor may any person serve, as a pilot in command of an aircraft operated in a commuter operation, as defined in part 119 of this chapter unless that person has completed, prior to designation as pilot in command, on
that make and basic model aircraft and in that crewmember position, the following operating experience in each make and basic model of aircraft to be flown:
  - Aircraft, single engine—10 hours
  - Aircraft multi-engine, reciprocating engine-powered—15 hours
  - Aircraft multi-engine, turbine engine-powered—20 hours
  - Airplane, turbojet-powered—25 hours

- Refer to Sec. 135.244, Operating Experience, for more information.

PLT407

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Task Number 184

Describe regulations related to fire extinguishers.

Definition

Description should include the following:

- There must be at least one hand fire extinguisher for use in the pilot compartment that is located within easy access of the pilot while seated.
- There must be at least one hand fire extinguisher located conveniently in the passenger compartment
  - of each airplane accommodating more than 6 passengers
  - of each commuter category airplane.
- For hand fire extinguishers, the following apply:
  - The type and quantity of each extinguishing agent used must be appropriate to the kinds of fire likely to occur where that agent is to be used.
  - Each extinguisher for use in a personnel compartment must be designed to minimize the hazard of toxic gas concentrations.
- Refer to Sec. 23.851, Fire Extinguishers, for more information.

PLT408

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Task Number 185

Describe duty period limitations.

Definition

Description should include the following:
• Each flight crewmember and flight attendant must be relieved from all duty for at least eight consecutive hours during any 24-hour period.

PLT409

Task Number 186

Describe flight engineer requirements.

Definition

Description should include the following:

• No person may operate an airplane for which a flight engineer is required by the type certification requirements without a flight crewmember holding a current flight engineer certificate.
• No person may serve as a required flight engineer on an airplane unless, within the preceding 6 calendar months, that person has had at least 50 hours of flight time as a flight engineer on that type airplane, or the Administrator has checked that person on that type airplane and determined that person is familiar and competent with all essential current information and operating procedures.
• Refer to Sec. 125.265, Flight Engineer Requirements, for more information.

PLT410

Task Number 187

Describe regulations related to flight instructor requirements.

Definition

Description should include the following:

• This subpart prescribes the requirements for the issuance of flight instructor certificates and ratings (except for flight instructor certificates with a sport pilot rating), the conditions under which those certificates and ratings are necessary, and the limitations on those certificates and ratings.
• Refer to Sec. 61.181, Applicability, for more information.
Task Number 188

Describe regulations related to flight release under VFR.

Definition

Description should include the following:

- No person may release an airplane for VFR operation unless the ceiling and visibility on route, as indicated by available weather reports or forecasts, or any combination thereof, are and will remain at or above applicable VFR minimums until the airplane arrives at the airport or airports specified in the flight release.
- Refer to Sec. 125.359, Flight Release under VFR, for more information.

PLT412

Task Number 189

Describe regulations related to fuel requirements.

Definition

Description should include the following fuel requirements for flight in VFR conditions:

- No person may begin a flight in an airplane under VFR conditions (considering wind and forecast weather conditions) unless there is enough fuel to fly to the first point of intended landing and, assuming normal cruising speed,
  - during the day, to fly after that for at least 30 minutes
  - at night, to fly after that for at least 45 minutes.
- No person may begin a flight in a rotorcraft under VFR conditions (considering wind and forecast weather conditions) unless there is enough fuel to fly to the first point of intended landing and, assuming normal cruising speed, to fly after that for at least 20 minutes.

PLT413

Task Number 190

Describe regulations related to general right-of-way rules.

Definition
Description should include the following:

- **General**—When weather conditions permit, regardless of whether an operation is conducted under IFR or VFR, vigilance shall be maintained by each person operating an aircraft so as to see and avoid other aircraft. When a rule of this section gives another aircraft the right-of-way, the pilot shall give way to that aircraft and may not pass over, under, or ahead of it unless well clear.
- **In distress**—An aircraft in distress has the right-of-way over all other air traffic.
- **Converging**—When aircraft of the same category are converging at approximately the same altitude (except head-on, or nearly so), the aircraft to the other's right has the right-of-way. If the aircraft are of different categories
  - o a balloon has the right-of-way over any other category of aircraft
  - o a glider has the right-of-way over an airship, powered parachute, weight-shift-control aircraft, airplane, or rotorcraft
  - o an airship has the right-of-way over a powered parachute, weight-shift-control aircraft, airplane, or rotorcraft
  - o however, an aircraft towing or refueling other aircraft has the right-of-way over all other engine-driven aircraft.
- **Approaching head-on**—When aircraft are approaching each other head-on, or nearly so, each pilot of each aircraft shall alter course to the right.
- **Overtaking**—Each aircraft that is being overtaken has the right-of-way and each pilot of an overtaking aircraft shall alter course to the right to pass well clear.
- **Landing**—Aircraft, while on final approach to land or while landing, have the right-of-way over other aircraft in flight or operating on the surface, except that they shall not take advantage of this rule to force off the runway surface an aircraft that has already landed and is attempting to make way for an aircraft on final approach. When two or more aircraft are approaching an airport for the purpose of landing, the aircraft at the lower altitude has the right-of-way, but it shall not take advantage of this rule to cut in front of another that is on final approach to land or to overtake that aircraft.
- **Refer to Sec. 91.113, Right-of-Way Rules, for more information.**

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**Task Number 191**

**Describe regulations related to notification.**

**Definition**

Description should include the following:

- Notice of investigation or subpoena
- Any person under investigation and any person required to testify and produce documentary or physical evidence during the investigation will be advised of the purpose
of the investigation, and of the place where the investigative proceeding or deposition will be convened.

• A copy of the order of investigation may be sent to such persons, when appropriate.
• Refer to Sec. 13.105, Notification, for more information

Task Number 192

Describe regulations related to individual flotation devices.

Definition

Description should include the following:

• No person may operate an airplane in any over-water operation unless it is equipped with life preservers in accordance with §121.339(a)(1) or with an approved flotation means for each occupant.
• Individual flotation devices must be within easy reach of each seated occupant and must be readily removable from the airplane.
• Refer to Sec. 121.340, Emergency Flotation Means, for more information.

Task Number 193

Describe regulations related to flight instructors.

Definition

Description should include the following:

• A person who holds a flight instructor certificate is authorized within the limitations of that person's flight instructor certificate and ratings to train and issue endorsements that are required for
  o a student pilot certificate
  o a pilot certificate
  o a flight instructor certificate
  o a ground instructor certificate
  o an aircraft rating
  o an instrument rating
o a flight review, operating privilege, or recency of experience requirement of this part.
- Refer to Sec. 61.193, Flight Instructor Privileges, for more information.

Task Number 194

Describe regulations related to the employment of flight instructors.

Definition

Description should include the fact that a certificate holder may not employ a person as an instructor in a flight training course that is subject to approval by the administrator.

Task Number 195

Describe regulations related to instrument approach procedures.

Definition

Description should include that an instrument approach, or instrument approach procedure (IAP), is a series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing or to a point from which a landing may be made visually.

Task Number 196

Describe regulations related to IFR.

Definition

Description should include the following:
Instrument flight rules (IFR) is one of two sets of regulations governing all aspects of civil aviation aircraft operations; the other is visual flight rules (VFR).

The FAA’s Instrument Flying Handbook defines IFR as “Rules and regulations established by the FAA to govern flight under conditions in which flight by outside visual reference is not safe.”

**Task Number 197**

Describe regulations related to intermediate airport authorizations.

**Definition**

Description should include the fact that the FAA may withdraw or temporarily suspend arrival authorizations at any time as a result of reduced airport capacity or to fulfill operational needs.

**Task Number 198**

Describe regulations related to knowledge and skill test checks.

**Definition**

Description should include the following:

- A pilot school certificated under FAA Part 141 may provide training and testing.
- Refer to Sec. 142.33, Training Agreements, for more information.

**Task Number 199**

Describe limits on autopilot usage.

**Definition**
Description should include the following:

- The FAA considers a pilot’s use and management of the autopilot to be the equivalent of manipulating the controls, just as one manages other flight control systems, such as trim or a yaw dampener.
- The autopilot system’s sophistication does not affect a pilot's responsibility to manipulate and manage all control systems, including an autopilot.

PLT424

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**Task Number 200**

Describe regulations related to maintenance records.

**Definition**

Description should include the following:

- Each certificate holder shall keep (using the system specified in the manual required in §121.369) records for specified periods.
- Refer to Sec. 121.380, Maintenance Recording Requirements, for more information.

PLT425

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**Task Number 201**

Describe regulations related to maintenance and alteration programs.

**Definition**

Description should include the following:

- Each certificate holder shall have an inspection program and a program covering other maintenance, preventive maintenance, and alterations, that ensures that
  - maintenance, preventive maintenance, and alterations performed by the certificate holder, or by other persons, are performed under the certificate holder's manual
  - competent personnel and adequate facilities and equipment are provided for the proper performance of maintenance, preventive maintenance, and alterations
  - each aircraft released to service is airworthy and has been properly maintained for operation under this part.
• Refer to Sec. 135.425, Maintenance, Preventive Maintenance, and Alteration Programs, for more information.

PLT426

Task Number 202

Describe regulations related to medical certificates.

Definition

Description should include the following:

• A medical certificate is obtained by passing a physical examination administered by a doctor who is an FAA-authorized Aviation Medical Examiner (AME).
• Pilots must obtain a medical certificate if the choice of aircraft is an airplane, helicopter, gyroplane, or an airship.
• Balloon or glider pilots do not need a medical certificate, but do need to write a statement certifying that no medical defect exists that would prevent them from piloting a balloon or glider.
• The new sport pilot category does not require a medical examination; a driver’s license can be used as proof of medical competence.

PLT427

Task Number 203

Describe regulations related to the minimum equipment list.

Definition

Description should include the following:

• A Minimum Equipment List (MEL) is an FAA-approved document that allows an aircraft owner/operator to fly with certain item(s) inoperative.
• The FAA produces a Master Minimum Equipment List (MMEL) for most aircraft to use. They provide the format that is acceptable to the administrator.

PLT428

Task Number 204
Describe regulations related to navigation instruments.

Definition

Description should include the following:

- VFR (including night VFR)
- Magnetic direction indicator
- Altimeter (for airspace navigation)

Task Number 205

Describe regulations related to minimum safe flight altitude.

Definition

Description should include that regulations address day VFR operations at an altitude less than 1,000 feet above the surface or less than 1,000 feet from any mountain, hill, or other obstruction to flight.

Task Number 206

Describe regulations related to operation near other aircraft.

Definition

Description should include the following:

- No person may operate an aircraft so close to another aircraft as to create a collision hazard.
- No person may operate an aircraft in formation flight except by arrangement with the pilot in command of each aircraft in the formation.
- No person may operate an aircraft, carrying passengers for hire, in formation flight.
- Refer to Sec. 91.111, Operating Near Other Aircraft, for more information.
Task Number 207

Describe regulations related to operational control functions.

Definition

Description should include the following:

- 14 CFR 121 and 14 CFR 135—Certificate holders are required to maintain operational control of their flight operations.
- Each certificate holder is responsible for operational control and shall list, in the manual required by §135.21, the name and title of each person authorized by it to exercise operational control.

PLT432

Task Number 208

Describe operational flight plan requirements.

Definition

Description should include the following:

- Filed by a pilot or flight dispatcher with the local Civil Aviation Authority (e.g., the FAA in the United States) prior to departure which indicate the plane's planned route or flight path.
- Include basic information such as departure and arrival points, estimated time en route, alternate airports in case of bad weather, type of flight (whether IFR or VFR), the pilot's information, number of people on board and information about the aircraft itself.
- In most countries, flight plans are required for flights under IFR, but may be optional for flying VFR unless crossing international borders.

PLT433

Task Number 209

Describe operational procedures for a controlled airport.

Definition
Description should include the following:

- A towered airport has an operating control tower.
- Air traffic control (ATC) is responsible for providing the safe, orderly and expeditious flow of air traffic at airports where the type of operations and/or volume of traffic requires such a service.
- Pilots operating from a towered airport are required to maintain two-way radio communication with ATC and to acknowledge and comply with their instructions.
- Pilots must advise ATC if they cannot comply with the instructions issued and request amended instructions.
- A pilot may deviate from an air traffic instruction in an emergency, but must advise ATC of the deviation as soon as possible.

PLT434

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**Task Number 210**

**Describe operational procedures for an uncontrolled airport.**

**Definition**

Description should include general operating procedures for the following:

- Left traffic
- Collision avoidance
- Unmanned aircraft
- Pre-flight actions
- Traffic flow
- Straight-in landings
- IFR traffic
- No-radio aircraft
- Wake turbulence
- Other landing approaches


PLT435

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**Task Number 211**

**Describe regulations related to the operations manual.**
Definition

Description should include the following:

- Each certificate holder shall keep a current approved airplane flight manual for each type of airplane that it operates except for non-transport category airplanes certificated before January 1, 1965.
- Refer to Sec. 121.141, Airplane Flight Manual, for more information.

PLT436

Task Number 212

Describe regulations related to overwater operations.

Definition

Description should include the following:

- No person may release an airplane for a flight that involves extended over-water operation unless appropriate weather reports or forecasts, or any combination thereof, indicate that the weather conditions will be at or above the authorized minimums at the estimated time of arrival at any airport to which released or to any required alternate airport.
- Refer to Sec. 125.363, Flight Release Over Water, for more information

PLT437

Task Number 213

Describe oxygen requirements.

Definition

Description should include the following:

- Unpressurized aircraft—Each pilot of an unpressurized aircraft shall use oxygen continuously when flying
  - at altitudes above 10,000 feet through 12,000 feet mean sea level (MSL) for that part of the flight at those altitudes that is of more than 30 minutes duration
  - above 12,000 feet MSL.
- Pressurized aircraft—Pilots should comply with the following:
When a pressurized aircraft is operated with the cabin pressure altitude more than 10,000 feet MSL
When a pressurized aircraft is operated at altitudes above 25,000 feet through 35,000 feet MSL, unless each pilot has an approved quick-donning type oxygen mask
At least one pilot at the controls shall wear, secured and sealed, an oxygen mask that either supplies oxygen at all times or automatically supplies oxygen whenever the cabin pressure altitude exceeds 12,000 feet MSL.

- Refer to Sec. 135.89, Pilot Requirements: Use of Oxygen, for more information.

Task Number 214

Describe regulations related to persons authorized to perform maintenance.

Definition

Description should include the following:

- Each certificate holder shall have an inspection program and a program covering other maintenance, preventive maintenance, and alterations that ensures that
  - maintenance, preventive maintenance, and alterations performed by the certificate holder, or by other persons, are performed in accordance with the certificate holder's manual
  - competent personnel and adequate facilities and equipment are provided for the proper performance of maintenance, preventive maintenance, and alterations
  - each aircraft released to service is airworthy and has been properly maintained for operation under this part.
- Refer to Sec. 121.367, Maintenance, Preventive Maintenance, and Alterations Programs, for more information.

Task Number 215

Describe crewmember duties and responsibilities.

Definition

Description should include the following:
• No certificate holder shall require, nor may any flight crewmember perform, duties during a critical phase of flight except those duties required for the safe operation of the aircraft. Duties such as company-required calls made for such nonsafety related purposes as ordering galley supplies and confirming passenger connections, announcements made to passengers promoting the air carrier or pointing out sights of interest, and filling out company payroll and related records are not required for the safe operation of the aircraft.
• Refer to Sec. 121.542, Flight Crewmember Duties, for more information.

Task Number 216
Describe pilot currency requirements.

Definition
Description should include the following:

• The FARs spell out currency requirements for pilots who want to carry passengers (three takeoffs and three landings within the preceding 90 days), carry passengers at night (three takeoffs and three landings to a full stop during the period beginning one hour after sunset and ending one hour before sunrise within the preceding 90 days) and carry passengers in conventionally configured—tailwheel—aircraft (three takeoffs and three landings to a full stop in a tailwheel airplane within the preceding 90 days).
• Please reference Sec. 61.57, Recent Flight Experience: Pilot in Command, for more information.

Task Number 217
Describe pilot qualifications.

Definition
Description should include the following:

• Pilot holds at least a commercial pilot certificate, an appropriate category, class, and type rating, and an instrument rating.
• Pilot has had at least 1,200 hours of flight time as a pilot, including 500 hours of cross-country flight time, 100 hours of night flight time, including at least 10 night takeoffs and
landings, and 75 hours of actual or simulated instrument flight time, at least 50 hours of which were actual flight.
- Refer to Sec. 125.281, Pilot-in-Command Qualifications for more information.

PLT443

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**Task Number 218**

**Describe pilot-in-command authority and responsibility.**

**Definition**

Description should include the following:

- The pilot in command of an aircraft is directly responsible for, and is the final authority as to, the operation of that aircraft.
- Refer to Sec. 91.3, Responsibility and Authority of the Pilot in Command, for more information.

PLT444

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**Task Number 219**

**Describe preflight requirements.**

**Definition**

Description should include the following:

- For a flight under IFR or a flight not in the vicinity of an airport, weather reports and forecasts, fuel requirements, alternatives available if the planned flight cannot be completed, and any known traffic delays of which the pilot in command has been advised by ATC
- For any flight, runway lengths at airports of intended use, and the following takeoff and landing distance information:
  - For civil aircraft for which an approved Airplane or Rotorcraft Flight Manual containing takeoff and landing distance data is required, the takeoff and landing distance data contained therein
  - For civil aircraft other than those specified in paragraph (b)(1) of this section, other reliable information appropriate to the aircraft, relating to aircraft performance under expected values of airport elevation and runway slope, aircraft gross weight, and wind and temperature.
Task Number 220

Describe regulations related to preventative maintenance.

Definition

Description should include the concept that preventive maintenance is regarded as simple or minor preservation operations and the replacement of small standard parts, not involving complex assembly operations.

Task Number 221

Describe privileges and limitations of medical certificates.

Definition

Description should include the following:

- There are three classes of medical certificates. The class of certificate needed depends on the type of flying the pilot plans to perform.
- A third-class medical certificate is required for a private or recreational pilot certificate. It is valid for five years for those individuals who have not reached the age of forty; otherwise it is valid for two years. A commercial pilot certificate requires at least a second-class medical certificate, which is valid for one year. First-class medical certificates are required for airline transport pilots and are valid for one year if the airman is forty or younger; forty and older it is valid for six months.

Task Number 222

Describe privileges and limitations of pilot certificates.

Definition
Description should include the following:

- No pilot may act as pilot in command of an aircraft (or as second in command of an aircraft in a flag or supplemental operation that requires three or more pilots) unless he or she holds an airline transport pilot certificate and an appropriate type rating for that aircraft.
- Refer to Sec. 121.437, Pilot Qualification: Certificates Required, for more information.

PLT448

Task Number 223

Describe proficiency-check requirements.

Definition

Description should include the following:

- No certificate holder may use any person nor may any person serve as a required pilot flight crewmember unless that person has satisfactorily completed either a proficiency check, or an approved simulator course of training under §121.409, as follows:
  - For a pilot in command, a proficiency check within the preceding twelve calendar months and, in addition, within the preceding six calendar months, either a proficiency check or the simulator training.
- Refer to Sec. 121.441, Proficiency Checks, for more information.

PLT449

Task Number 224

Describe regulations related to flight time limitations and rest requirements.

Definition

Description should include the following:

- A flight crewmember is not considered to be assigned flight time in excess of flight time limitations if the flights to which he is assigned normally terminate within the limitations, but due to circumstances beyond the control of the certificate holder or flight crewmember (such as adverse weather conditions), are not at the time of departure expected to reach their destination within the planned flight time.
- Refer to Sec. 135.263, Flight Time Limitations and Rest Requirements: All Certificate Holders, for more information.

PLT450

**Task Number 225**

**Describe runway requirements.**

**Definition**

Description should include the following:

- In many cases, the landing distance of an aircraft defines the runway requirements for flight operations.
- The minimum landing distance is obtained by landing at some minimum safe speed, that allows sufficient margin above stall and provides satisfactory control and capability for a go-around.

PLT456

**Task Number 226**

**Describe regulations related to student pilot endorsements and other endorsements.**

**Definition**

Description should include that part 61 of Title 14, Code of Federal Regulation, provides pilots regulatory details on how to obtain these additional ratings or privileges.

PLT457

**Task Number 227**

**Describe regulations related to takeoff procedures and minimums.**

**Definition**
Description should include the following:

- The minimum takeoff distance is of primary interest in the operation of any aircraft because it defines the runway requirements.
- The minimum takeoff distance is obtained by taking off at some minimum safe speed that allows sufficient margin above stall and provides satisfactory control and initial ROC. Generally, the lift-off speed is some fixed percentage of the stall speed or minimum control speed for the aircraft in the takeoff configuration. As such, the lift-off is accomplished at some particular value of lift coefficient and AOA.

Task Number 228

Describe regulations related to the use of aircraft lights.

Definition

Description should include the following:

- No person may operate an aircraft unless it has lighted position lights.
- No person may park or move an aircraft in, or in dangerous proximity to, a night flight operations area of an airport unless the aircraft
  - is clearly illuminated
  - has lighted position lights
  - is in an area that is marked by obstruction lights.
- Refer to Sec. 91.209, Aircraft Lights, for more information.

Task Number 229

Describe regulations related to alcohol and drugs.

Definition

Description should include that most pilots are aware of the eight-hour rule; that is, eight hours from bottle to throttle; although many airlines have a more stringent twelve-hour time limit.

Task Number 230
Describe regulations related to crewmembers’ use of safety belts and harnesses.

Definition

Description should include the following:

- Each required flight crewmember of a U.S.-registered civil aircraft shall, during takeoff and landing, keep his or her shoulder harness fastened while at his or her assigned duty station. This does not apply if
  - the seat at the crewmember's station is not equipped with a shoulder harness; or
  - the crewmember would be unable to perform required duties with the shoulder harness fastened.
- Refer to Sec. 91.105, Flight Crewmembers at Stations, for more information.

Task Number 231

Describe regulations related to passengers’ use of seats, safety belts, and harnesses.

Definition

Description should include the following:

- Each passenger is required by §91.107(a)(3) to occupy a seat or berth shall fasten his or her safety belt about him or her and keep it fastened while any “fasten seat belt” sign is lighted.
- Each passenger shall comply with instructions given him or her by crewmembers.

Task Number 232

Describe the role of the National Transportation Safety Board (NTSB).

Definition
Description should include the following:

- The NTSB is an independent U.S. government investigative agency responsible for civil transportation accident investigation.
- In this role, the NTSB investigates and reports on aviation accidents and incidents, certain types of highway crashes, ship and marine accidents, pipeline incidents, and railroad accidents.

PLT498

### SOL Correlation by Task

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<td>Describe certificate issuance and renewal.</td>
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<td>Describe change-of-address regulations.</td>
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<td>Describe regulations related to cockpit voice and flight data recorders.</td>
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<td>167</td>
<td>Describe commercial operation requirements and conditions (OpSpecs).</td>
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<td>168</td>
<td>Explain regulations related to communications en route.</td>
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<td></td>
<td>Describe procedures to remedy communications failure.</td>
<td>English: 11.5, 12.5</td>
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<td>Explain compliance with local regulations.</td>
<td>English: 11.5, 12.5</td>
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<td>171</td>
<td>Describe regulations and requirements related to controlled or restricted airspace.</td>
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<td>172</td>
<td>Describe regulations related to declaration of an emergency.</td>
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<td>173</td>
<td>Describe regulations related to destination airport visibility.</td>
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<td>Describe regulations related to dispatch.</td>
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<td>175</td>
<td>Describe regulations related to the display and inspection of licenses and certificates.</td>
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<td>176</td>
<td>Identify documents to be carried on aircraft during flight.</td>
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<td>177</td>
<td>Describe regulations related to dropping objects.</td>
<td>English: 11.5, 11.8, 12.5, 12.8</td>
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<td>178</td>
<td>Describe regulations related to emergency locator transmitters (ELT).</td>
<td>English: 11.5, 11.8, 12.5, 12.8</td>
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<td>179</td>
<td>Explain emergency deviation from regulations.</td>
<td>English: 11.5, 11.8, 12.5, 12.8</td>
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<td>180</td>
<td>Describe regulations related to safety equipment.</td>
<td>English: 11.5, 11.8, 12.5, 12.8</td>
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<td>Describe regulations related to instruments and equipment.</td>
<td>English: 11.5, 11.8, 12.5, 12.8</td>
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<td>Describe regulations related to equipment failure.</td>
<td>English: 11.5, 11.8, 12.5, 12.8</td>
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<td>183</td>
<td>Describe regulations related to operating experience and training.</td>
<td>English: 11.5, 11.8, 12.5, 12.8</td>
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<td>Describe regulations related to fire extinguishers.</td>
<td>English: 11.5, 11.8, 12.5, 12.8</td>
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<td>Describe duty period limitations.</td>
<td>English: 11.5, 11.8, 12.5, 12.8</td>
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<td>Describe flight engineer requirements.</td>
<td>English: 11.5, 11.8, 12.5, 12.8</td>
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<td>Describe regulations related to flight instructor requirements.</td>
<td>English: 11.5, 11.8, 12.5, 12.8</td>
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<td>188</td>
<td>Describe regulations related to flight release under VFR.</td>
<td>English: 11.5, 11.8, 12.5, 12.8</td>
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<td>189</td>
<td>Describe regulations related to fuel requirements.</td>
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<td>Describe regulations related to general right-of-way rules.</td>
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<td>Describe regulations related to notification.</td>
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<td>Describe regulations related to individual flotation devices.</td>
<td>English: 11.5, 11.8, 12.5, 12.8</td>
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<td>Describe regulations related to flight instructors.</td>
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<td>Describe regulations related to the employment of flight instructors.</td>
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<td>Describe regulations related to instrument approach procedures.</td>
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<td>Describe regulations related to IFR.</td>
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<td>Describe regulations related to intermediate airport authorizations.</td>
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<td>Describe regulations related to knowledge and skill test checks.</td>
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<td>Describe limits on autopilot usage.</td>
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<td>Describe regulations related to maintenance records.</td>
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<td>Describe regulations related to maintenance and alteration programs.</td>
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<td>Describe regulations related to medical certificates.</td>
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<td>Describe regulations related to the minimum equipment list.</td>
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<td>Describe regulations related to navigation instruments.</td>
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<td>Describe regulations related to minimum safe flight altitude.</td>
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<td>Describe regulations related to operation near other aircraft.</td>
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<td>Describe regulations related to operational control functions.</td>
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<td>Describe operational flight plan requirements.</td>
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<td>209</td>
<td>Describe operational procedures for a controlled airport.</td>
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<td>210</td>
<td>Describe operational procedures for an uncontrolled airport.</td>
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<td>Describe regulations related to the operations manual.</td>
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<td>Describe regulations related to overwater operations.</td>
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<td>Describe oxygen requirements.</td>
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<td>214</td>
<td>Describe regulations related to persons authorized to perform maintenance.</td>
<td>English: 11.5, 12.5</td>
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<td>215</td>
<td>Describe crewmember duties and responsibilities.</td>
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<td>216</td>
<td>Describe pilot currency requirements.</td>
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<td>Describe pilot qualifications.</td>
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<td>218</td>
<td>Describe pilot-in-command authority and responsibility.</td>
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<td>Describe preflight requirements.</td>
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<td>220</td>
<td>Describe regulations related to preventative maintenance.</td>
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<td>221</td>
<td>Describe privileges and limitations of medical certificates.</td>
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<td>222</td>
<td>Describe privileges and limitations of pilot certificates.</td>
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<td>223</td>
<td>Describe proficiency-check requirements.</td>
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<td>224</td>
<td>Describe regulations related to flight time limitations and rest requirements.</td>
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<td>225</td>
<td>Describe runway requirements.</td>
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<td>226</td>
<td>Describe regulations related to student pilot endorsements and other endorsements.</td>
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<td>227</td>
<td>Describe regulations related to takeoff procedures and minimums.</td>
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<td>228</td>
<td>Describe regulations related to the use of aircraft lights.</td>
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<td>Describe regulations related to alcohol and drugs.</td>
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<td>230</td>
<td>Describe regulations related to crewmembers’ use of safety belts and harnesses.</td>
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<td>231</td>
<td>Describe regulations related to passengers’ use of seats, safety belts, and harnesses.</td>
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<td>232</td>
<td>Describe the role of the National Transportation Safety Board (NTSB).</td>
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</table>
Appendix: Credentials, Course Sequences, and Career Cluster Information

Industry Credentials: Only apply to 36-week courses

- College and Work Readiness Assessment (CWRA+)
- Customer Service Examination
- Customer Service Specialist (CSS) Examination
- National Career Readiness Certificate Assessment
- Professional Communications Certification Examination
- Small Unmanned Aircraft System (UAS) Safety Certification Examination
- Workplace Readiness Skills for the Commonwealth Examination

Concentration sequences: A combination of this course and those below, equivalent to two 36-week courses, is a concentration sequence. Students wishing to complete a specialization may take additional courses based on their career pathways. A program completer is a student who has met the requirements for a CTE concentration sequence and all other requirements for high school graduation or an approved alternative education program.

- Aircraft Pilot Training II (8732/36 weeks, 280 hours)

Career Cluster: Transportation, Distribution and Logistics

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<tr>
<th>Pathway</th>
<th>Occupations</th>
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<td>Air Traffic Controller</td>
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<td>Flight Engineer</td>
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<td>Pilot</td>
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