

**King Schools Online  
Internet Learning Programs**

# **JET TRANSITION COURSE**

## **SYLLABUS**

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# Jet Transition Course

## *Pilot Training Syllabus*

### **INTRODUCTION**

The King Schools Online *Jet Transition Course* gives a big head-start on training for flying a jet. This course gives practical tips and techniques for flying a jet, and help in avoiding the common mistakes that pilots transitioning to jets often make. This course provides:

- Practical considerations on flying a jet that standard transition courses do not
- Pilot techniques that will free up pilot attention to allow a focus on risk management
- Learning through individual Internet study
- A graduation certificate

### **COURSE ELEMENTS AND STRUCTURE**

The King Schools Online *Jet Transition Course* contains eight major subject areas (Labs) with two or more distinct Lessons per Lab. Following each Lesson's study materials, the pilot sees a quiz containing multiple-choice and/or True/False questions. There are approximately 120 questions in the course. Most pilots will require approximately four hours to complete this course.

### **COMPLETION STANDARDS**

Lesson completion requires accessing each lesson page of study materials and correctly answering all questions in the quiz associated with that Lesson. An individual Lab is finished after completing all of the Lessons contained in that Lab. Pilots complete the course when all the Labs are checked off with a completion date on the course main menu.

### **CERTIFICATE OF COMPLETION**

A Completion Certificate individualized for the pilot enrolled in the course may be accessed at the "Print Your Course Complete Materials and Endorsement" icon/link on the main menu after the entire course has been completed. Pilots clicking the "Print Your Course Complete Materials and Endorsement" icon/link before the course has been completed receive a message saying that the certificate will be available after the entire course is completed.

### **ENROLLMENT PROCEDURES**

A pilot may individually order and enroll in the course, or flight departments may order multiple courses and receive a "key" for each course ordered. The flight department then assigns a key to each pilot requiring training. Each pilot registers individually at <https://ilearn.kingschools.com> for the course.

### **COURSE STUDY**

The pilot first enrolls in the course, and then logs in to access the course Labs and Lessons. If the pilot has insufficient time to complete the course in one session, the pilot may log out. The program records all Lesson and Lab completions and every question answered. When returning to the course, the pilot may resume at the last point of progress.

# LAB 1

## WHY FLYING JETS IS DIFFERENT – AND EXCITING!

### LESSONS

#### 1 **The Thrill of Flying Jets**

Lesson Objective: To understand the different sensations involved in jet flying.

#### 2 **Major Differences in Flying Jets**

Lesson Objective: To gain an overview of the differences between flying piston airplanes and flying jet airplanes, with emphasis on the need for enhanced pitch and speed control.

# LAB 2

## HOW JET ENGINES WORK

### LESSONS

#### 1 **Advantages of Jet Engines**

Lesson Objective: To learn the operational advantages of turbine engines over piston engines.

#### 2 **All Airplane Engines Accelerate Air**

Lesson Objective: To review the basic principles by which piston engines and turbine engines produce power.

#### 3 **Jet Engine Terminology**

Lesson Objective: To learn the terminology for the major sections of a turbine engine.

#### 4 **Four Main Processes of an Internal Combustion Engine**

Lesson Objective: To understand how the processes of an internal combustion engine are applied in a turbojet, and to learn more about compressors and combustors.

#### 5 **Fanjets**

Lesson Objective: To learn how fanjet engines differ from turbojet engines, and to understand why fanjets were developed.

# LAB 3

## OPERATING JET ENGINES

### LESSON

#### **1 Thrust Levers**

Lesson Objective: To learn how the thrust levers on a jet engine control the power output.

#### **2 Setting Power**

Lesson Objective: To learn about the engine gauges used to set power on a jet engine, and about the temperature limitations of the engine.

#### **3 Starting Jet Engines**

Lesson Objective: To learn how the start sequence works on a jet engine, and the role of the ignition.

#### **4 Relationship of Thrust to Thrust Lever Position**

Lesson Objective: To understand the variation in the relationship of thrust lever movement and thrust produced, and its significance regarding engine control.

#### **5 Jet Engine Efficiency and Altitude**

Lesson Objective: To learn about the relationship of altitude to fuel efficiency for a jet engine.

# LAB 4

## JET SYSTEMS THAT MAY BE NEW TO YOU

### LESSON

#### 1 **Jet Airplane Fuel Systems**

Lesson Objective: To learn about new components in jet aircraft fuel systems, including motive flow pumps and fuel heaters.

#### 2 **Fire Detection and Suppression Systems**

Lesson Objective: To learn about fire detection and extinguishing systems on a jet engine.

#### 3 **Air Cycle Machines**

Lesson Objective: To learn the function of an air cycle machine and how hot air from the engine can be used to cool the cabin.

#### 4 **More Complex Electrical Systems**

Lesson Objective: To learn about multiple electrical busses, Nicad batteries, emergency batteries, and load shedding.

#### 5 **Inverters**

Lesson Objective: To learn what parts of the electrical system usually need an inverter in order to receive power, and how the inverters are usually configured.

#### 6 **Hydraulic Systems**

Lesson Objective: To learn what systems are usually operated by hydraulic pressure, and the basics of how hydraulic systems work.

#### 7 **Anti-Skid Brakes**

Lesson Objective: To learn the principles of anti-skid brakes in an aircraft, and how to operate them.

#### 8 **Nosewheel Steering**

Lesson Objective: To understand why rudder pedals often won't steer a jet on the ground, and to learn about different ways of steering the nosewheel.

#### 9 **Drag Devices**

Lesson Objective: To learn about the drag devices a jet aircraft might have, including spoilers and airbrakes, and how different types of thrust reversers operate.

# LAB 5

## HIGH-ALTITUDE AERODYNAMICS

### LESSONS

#### 1 **Determining True Airspeed**

Lesson Objective: To learn (given indicated airspeed, pressure altitude, and indicated temperature) how to calculate true airspeed for high-altitude, high-speed jets by applying the appropriate corrections, including corrections for the effects of compressibility and temperature rise.

#### 2 **Understanding Your Speed Limits**

Lesson Objective: To learn the significance of  $V_{MO}$  and  $M_{MO}$ , and when each becomes the limiting factor.

#### 3 **Why You Should Respect the $M_{MO}$**

Lesson Objective: To learn the consequences of exceeding  $M_{MO}$ .

#### 4 **How Aircraft Design Is Used to Minimize High Mach Effects**

Lesson Objective: To learn the techniques aircraft designers use to minimize the effects of high Mach numbers.

#### 5 **Converging High-Speed and Low-Speed Buffet —The Coffin Corner**

Lesson Objective: To learn why the margins between Mach buffet and stall buffet can in some cases be very narrow, and how to avoid that situation.

# LAB 6

## GUARANTEES MOST JETS PROVIDE

### LESSON

#### **1 The Certification Determines Whether You Get the Guarantee**

Lesson Objective: To learn how the certification of a jet aircraft affects its performance guarantees.

#### **2 Getting the Guarantee**

Lesson Objective: To understand what the performance guarantees are, and how to operate your aircraft in order to get them.

#### **3 Getting the Guarantee in IMC**

Lesson Objective: To learn the relationship of your performance guarantees to a departure in IMC.

#### **4 Definition of Speeds Used in the Profile**

Lesson Objective: To understand the terminology used in the departure profile.

#### **5 Landing Requirements**

Lesson Objective: To learn what items limit your allowable landing weight, and where to go to obtain landing distance information.

# LAB 7

## PILOT TECHNIQUES FOR FLYING JETS

### LESSON

#### 1 **Jet Flight Planning**

Lesson Objective: To learn how altitude affects fuel flow in a jet engine, and to understand the reason for having rules of thumb (in addition to the aircraft flight planning charts) for determining your fuel usage.

#### 2 **Pre-Takeoff Calculations**

Lesson Objective: To learn the elements involved in computing your takeoff information, and to know what to do with the information (including  $V_1$ ,  $V_R$ , and  $V_2$ ).

#### 3 **Before Takeoff**

Lesson Objective: To learn the flow of a takeoff briefing, including what risk management issues should be covered, and how to make sure you have covered the “killer items” on the checklist.

#### 4 **Takeoff Roll**

Lesson Objective: To review some takeoff procedures, including standard callouts and responses, that, if followed, will help ensure you get your performance guarantees; and to explore when and why you might want to reject a takeoff.

#### 5 **Rotation and Lift-Off**

Lesson Objective: To learn about the speed of rotation and the significant pitch-up required in a jet takeoff.

#### 6 **Initial Climb**

Lesson Objective: To learn standard callouts and responses for immediately after takeoff, and to understand how easily the aircraft can end up violating speed limits.

#### 7 **Climb to Altitude**

Lesson Objective: To learn a typical climb schedule for a jet aircraft, and standard callouts and responses during the climb.

#### 8 **Cruise**

Lesson Objective: To learn why you need to be careful with your engines at altitude, and to consider some items you should plan ahead on while you are still in cruise including calculating your  $V_{REF}$  (approach speed) for the landing and your descent point.

**9 Descent**

Lesson Objective: To learn some techniques for smoother descents.

**10 Maneuvering in Range of the Terminal Area**

Lesson Objective: To understand how having some rules of thumb for your power settings greatly reduces your workload at lower altitudes, and to learn techniques for smooth altitude changes and level-offs.

**11 Final Approach**

Lesson Objective: To learn why having a stabilized approach is so critical in a jet aircraft, what the criteria are for a stabilized approach, and how to make sure you fly one.

**12 Landing**

Lesson Objective: To understand why the flare is different in a jet than in a piston aircraft and why a jet tends to use more runway, and to learn techniques for a smooth touchdown and effective stopping without using excessive runway distance.

**13 Situational Awareness and Crew Coordination**

Lesson Objective: To learn additional callouts and responses that will enhance situational awareness and risk management, and to understand why the second pilot is really there.

# LAB 8

## REGULATIONS THAT APPLY TO JET Operations

### LESSONS

#### 1 **Captain's Type Rating Requirement**

Lesson Objective: To learn the details of the FAA's requirement for a type rating to act as PIC of a jet aircraft.

#### 2 **Copilot Requirements**

Lesson Objective: To learn what requirements a pilot really needs to meet, in order to be a legal copilot in a jet that requires two pilots.

#### 3 **Pilot and Copilot Currency**

Lesson Objective: To learn about pilot proficiency checks, who must have them, and how often.

#### 4 **High-Altitude Endorsement**

Lesson Objective: To learn what specific ground and flight training the FAA requires in order for a pilot to act as PIC of a pressurized aircraft capable of flight above 25,000 feet MSL.

#### 5 **RVSM Airspace**

Lesson Objective: To learn where RVSM (Reduced Vertical Separation Minimum) airspace is located and what approvals must be obtained from the FAA in order to fly in RVSM airspace.

#### 6 **Flight Rules for Large and Turbine-Powered Multi-Engine Airplanes**

Lesson Objective: To learn the special operating rules for multi-engine jet aircraft, including items to be carried on board and altitudes to be flown.

#### 7 **Maintaining Multi-Engine Jets**

Lesson Objective: To learn about the maintenance and recordkeeping requirements for a multi-engine jet aircraft.

#### 8 **The MEL and CDL**

Lesson Objective: To learn how an MEL (Minimum Equipment List) can sometimes let you take off in a jet aircraft with inoperative equipment, and about the FAA approval the MEL needs.