

# Using FlightSIM Course Syllabus

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Session duration: **Classroom 4 days\***

**\*Note:** This syllabus covers only a portion of the course. The other part of the course is a development workshop taught by a software engineer.

## Main Objective

In this course, you will learn how to effectively use FlightSIM and receive a global overview of its capabilities and data structures.

Upon completion of the course, you will be able to define and modify Flight Models, and test them using the FlightSIM tools.

## Target Audience

This is an ideal course for users and developers with basic PC knowledge that want to learn how to use FlightSIM.

## Prerequisites

This course assumes basic PC knowledge.

## Format

This Instructor-led course is taught through a series of lectures and hands-on exercises in which you learn how to use all of the components of the tool.

## Topics Covered

- Introduction to FlightSIM
- FlightSIM Components
- Licenses and Documentation
- FlightSIM 3D Viewer
- Runtime Perspective
- Setup, Plots, Tests and Communication and Control
- Modeler Perspective
- Flight Model, Engines and Additional Loads
- Equation Editor
- Curve Panel
- User Parameters, User Curves and User Dataset
- Replacing User's module
- Communicating with Shared Memory
- Pilot input devices

# Detailed Description

## Lesson 1: Introduction to FlightSIM

- About FlightSIM
- Course goals
- Block diagram
- FlightSIM components
- FlightSIM installation
- FlightSIM folders
- Licenses
- License Types
- Documentation and Help
- The FlightSIM 3D Viewer
- Starting the 3D Viewer
- Training package installation
- EXERCISE 1-1: Flying an aircraft
- EXERCISE 1-2: Flying an aircraft (Training folders)
- Keyboard Commands

## Lesson 2: Run-Time Perspective

- Run-Time perspective
- Perspective description
- Title Bar
- Menu Bar
- Perspective toolbar
- Simulation Control toolbar
- Run-Time Control
- Configuration panes
- Setup
- Plots
- Tests
- Communication and Control
- Projects and profiles
- Saving a Project
- Project Settings
- About profiles
- Profile shortcut menu
- EXERCISE 2-1: Adding turbulence
- EXERCISE 2-2: Doing a TEST Flight
- EXERCISE 2-3: Making a flight test

- EXERCISE 2-4: Creating a Trajectory Profile

### Lesson 3: Modeler Perspective

- Modeler perspective
- Perspective Description
- Equation Editor
- Component Coordinates Editor
- Curve Panels
- User Parameters, User Curves and User Datasets.
- User Parameters
- User Curves
- User Datasets
- FlightSIM Coordinate Systems
- Axes of an aircraft
- Aircraft Design Coordinate system
- Supported reference frames
- Simulation model Overview
- Using different folders for the exercises
- EXERCISE 3-1: Creating a User Dataset
- EXERCISE 3-2: Creating a User Curves
- EXERCISE 3-3: Using the Equation Editor
- EXERCISE 3-4: Modify an engine's performance
- EXERCISE 3-5: Modify a Propeller
- EXERCISE 3-6: Summary Exercise

### Lesson 4: FlightSIM Development

#### User Modules

- What is a User Module?
- How does it work?
- Shared library user modules
- Shared library daemon functions list
- Shared library permanent functions list
- Shared library system list
- Shared library subsystem list
- Permanent function API (Flsim\_Api\_Perm\_Fct)
- Daemon function API (Flsim\_Api\_Dmon\_Fct)
- System model API (Flsim\_Api\_System)
- System Model Load Structure
- Subsystem Model API (Flsim\_Api\_Subsys)
- Subsystem Model Load Structure .
- EXERCISE 4-1: Replacing a FlightSIM default system
- EXERCISE 4-2: Adding a new FlightSIM default system

- EXERCISE 4-3: Replacing a subsystem
- EXERCISE 4-4: Create a user module using Global Data
- EXERCISE 4-5: Creating and Accessing Private Data
- EXERCISE 4-6: Creating subsystems
- EXERCISE 4-7: SAR and RAP Examples
- EXERCISE 4-8: Replacing thrust engine of an F16

## Lesson 5: Communication

- Shared Memory
- Export Buffer
- Coded definition
- nCOM definition
- Installing pilot control devices
- Using different folders for the exercises
- EXERCISE 5-1: External App Reading from Shared Memory
- EXERCISE 5-2: Pilot Input Devices
- EXERCISE 5-3: External Application Requesting Engines Startup Sequence