LEARN GUIDANCE AND CONTROL
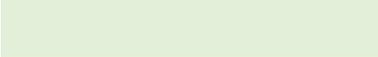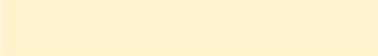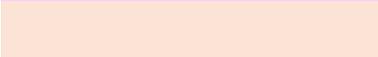
Patreon Page Contents

The table below contains a chronological list of lessons posted to the [Learn Guidance and Control Patreon page](). The intent of this list is to provide a convenient reference to the primary video lessons, notes, codes, and exclusive tutorials.

Each row corresponds to a specific post identified by the date and title. If it is not a Patreon exclusive posting, the video will be available on YouTube. Further, all YouTube video content is organized for your convenience on [www.LearnGandC.com](). The fourth column contains a list of the post contents. Mostly, the content is the code used to create the lesson, but you'll find other useful things as well. Finally, the fifth column contains additional information about the post, such as the lesson series (e.g. Guidance Fundamentals, Longitudinal Flight Control, Lateral Flight Control, or 6-DOF Simulation Tutorial). Corresponding links are provided for convenience.

For quick reference, the lesson series that each post corresponds to is color coded according to the legend below.

COLOR LEGEND FOR LESSON SERIES

Lesson Series	Color
Guidance	(green)
Longitudinal Flight Control	(yellow)
Lateral Flight Control	(magenta)
6-DOF Simulation Development Tutorial	(peach)
Quick Concepts in Control	(light blue)
State Estimation	(orange)
Optimal Control	(gray)
Other Topics	

List Current as of March 21st, 2026 (New content may exist on Patreon ahead of this list being updated)

Patreon Post Date	Patreon Post Title	Corresponding LearnGandC.com /YouTube Video Lesson Title	Patreon Post Contents	Additional Comments
3/15/2026	Robust Servomechanism Design	Robust Servomechanism Design, The Internal Model Principle, and Flight Control	1. 38 minute video lesson ad-free, 2. Code package	Categorized on LearnGandC.com under Optimal Control
2/16/2026	The Linear Quadratic Integrator: Construction, Properties, Limits, and the X29A	Linear Quadratic Integrator (LQI) Explained – Optimal Tracking, Disturbance Rejection, X29A Control	1. 32 minute video ad-free, 2. LQI Code	Categorized on LearnGandC.com under Optimal Control
1/10/2026	Part II: Code Tutorial for Multivariable X29A LQR Control Design	Not Available on YouTube	1. 54 minute video lesson	Continuation of Part I explaining how to use the code
1/2/2026	Part I: Multivariable X29A LQR Control Design – The Missing Link to Burken's Lecture	Not a video lesson / available on YouTube	1. X29A LQR Code Package	Supports lateral and optimal flight control, but is not part of the Lateral Control Series
12/20/2025	Yaw Orientation Control, Multivariable Robustness	Multivariable Control: Yaw Rate Tracking & Turn Coordination - Lateral Flight Control - Section 1.4	1. 40 minute video lesson ad-free, 2. Yaw orientation control package, 2. Written notes on subject matter	A lesson in the lateral flight control series
11/16/2025	How to Visualize MATLAB/Octave Data in FlightGear to Assist Control	Not Available on YouTube	1. Octave-to-FlightGear Bridge (code package)	A tool to visualize aircraft flight response in the tuning phase of flight control

	[Design (A "Lessons Learned" Guide)](#)			system development.
10/8/2025	[New Release: A Survey of State Estimation Methods for Aerospace Systems](#)	[State Estimation Explained: From Least Squares to Kalman Filters | Lesson 1.1](#)	1. 46-minute ad-free video lesson, 2. [Octave script for all examples in lesson](#)	[The first in a new series on State Estimation](#)
7/18/2025	[Trim in 6-DOF – Lesson 4.1](#)	[Aircraft Trim with Optimization in 6-DOF | 6-DOF Flight Simulation Tutorial - Section 4.1](#)	1. 54-minute video lesson 2. Updated [Python Flight Simulation v0.3.0](#)	Part of [6DOF Simulation Tutorial Series](#)
6/2/2025	[Trajectory Shaping Guidance Course](#)	Available only on Patreon	[See course description](#)	Offered to subscribers for free for a limited time after release. [Now available for purchase](#).
5/9/2025	[Sideslip & Sideslip Rate Feedback for Improved Turn Coordination](#)	[Sideslip Rate Feedback for Improved Turn Coordination – Lateral Flight Control – Section 1.3](#)	1. [Written notes](#), 2. [Design codes](#)	Part of [Lateral Flight Control](#) Series
4/18/2025	[Terminal Attitude Trajectory Shaping Guidance](#)	[Attitude Trajectory Shaping Guidance – Guidance Fundamentals II](#)	1. [Written notes](#), 2. [Linear simulation codes](#), 3. [Nonlinear simulation codes](#)	Part of [Guidance Fundamentals II](#) series
3/2/2025	[Lateral Flight Control: Automatic Turn Coordination - Section 1.2](#)	[Automatic Turn Coordination | Adverse Yaw | Lateral Dynamics | Lateral Flight Control – Section 1.2](#)	1. 31 minute video lesson (ad-free), [2. Octave codes/scripts](#), 3. [Written technical notes for the lesson.](#)	Part of the [Lateral Flight Control Series](#)
1/27/2025	[Section 3.2 Building a 6-DOF Aircraft Model](#)	[How to Build an X-15 Aircraft Model from Literature](#)	1. 49-minute video lesson 2. Updated	Part of [6DOF Simulation Tutorial Series](#)

	from Open Literature: A Step-by-Step Guide Using the X-15		Python Flight Simulation v0.2.0	
12/18/2024	Dutch Roll Control – Section 1.1	Dutch Roll Damping – Section 1.1	1. 20 minute video lesson (ad-free) 2. Dutch roll damping design scripts	Part of Lateral Flight Control Series
11/16/2024	X-15 Stability Augmentation	X-15 Stability Augmentation System, Section 3.1	1. Video lesson ad-free 2. Python Flight Simulation v0.1.1	Part of 6DOF Simulation Tutorial Series
10/20/2024	Section 2.2.4 Python Flight Simulation Update	Patreon Exclusive	1. 23 minute video tutorial (ad-free) 2. Python Flight Simulation v0.1.0	Part of 6DOF Simulation Tutorial Series
9/29/2024	Section 2.2.3 X-15 Flight Model Development	Patreon Exclusive	1. 17 minute video tutorial (ad-free) 2. Python Flight Simulation for Section 2.2.3	Part of 6DOF Simulation Tutorial Series
9/8/2024	Section 2.2.2 Initial X-15 Flight Simulation	Patreon Exclusive	1. 36 minute video tutorial (ad-free) 2. Python Flight Simulation for Section 2.2.2	Part of 6DOF Simulation Tutorial Series
8/25/2024	Section 2.2.1 X-15 Aero Model Development	Patreon Exclusive	1. 15 minute video tutorial (ad-free)	Part of 6DOF Simulation Tutorial Series
8/10/2024	Section 2.1 X-15 Systems Review for 6DOF Model	X-15 Systems Review for Model Development – Section 2.1	1. 29 minute video lesson (ad-free)	Part of 6DOF Simulation Tutorial Series
7/5/2024	Section 1.5 – Flight Simulation Development	Flying Bricks	6-DOF Verification	Aerodynamic Damping	Flight Simulation Tutorial	Section 1.5	1. 21 minute video lesson (ad-free) 2. Python Flight Simulation for Section 1.5	Part of 6DOF Simulation Tutorial Series

6/19/2024	Preview: Section 1.5 6DOF Simulation Development	Patreon Exclusive	1. 38 minute preview/tutorial (ad-free) 2. Draft of Python Flight Simulation for Section 1.5	Supports 6DOF Simulation Tutorial Series
6/8/2024	Aircraft Simulation Tutorial Section 1.4 Released	Navigation Equations | Atmosphere | Aerodynamics | Angle of Attack/Sideslip | Flight Sim - Section 1.4	1. 35 minute video lesson link 2. Python Flight Simulation for Section 1.4	Part of 6DOF Simulation Tutorial Series
5/13/2024	Section 1.4 Flight Simulation Series Preview	Patreon Exclusive	1. 46 minute preview/tutorial (ad-free) 2. Draft of Python Flight Simulation for Section 1.4	Supports 6DOF Simulation Tutorial Series
5/3/2024	Aircraft Simulation with Euler Kinematics Section 1.3	Aircraft Euler Kinematics (Attitude) Simulation in Python – Flight Simulation Tutorial - Section 1.3	Python Flight Simulation for Section 1.3	Part of 6DOF Simulation Tutorial Series
4/7/2024	Aircraft 6-DOF Development Section 1.2	Aircraft 6-DOF Equations and Coding in Python – Aircraft Flight Simulation Tutorial – Section 1.2	Python Flight Simulation for Section 1.2	Part of 6DOF Simulation Tutorial Series
3/9/2024	Aircraft Simulation Tutorial - Introduction	Six Degree of Freedom 6-DOF Aircraft Flight Simulation Tutorial - Introduction - Section 1.1	YouTube or LearnGandC.com Video Lesson	First lesson in 6DOF Simulation Tutorial Series
2/10/2024	Statistics of Noisy Signals for Kalman Filters	Probability & Statistics of Noisy Signals for Kalman Filters, Guidance Fundamentals II, Section 1.2	1. Code used to create the video lesson	Part of Guidance Fundamentals II

1/6/2024	Time to Go Estimation Part 2 (The final product)	Time to Go Estimation - Guidance Fundamentals II - Section 1.1	1. Set of 7 scripts used to create the lesson (bottom of page)	Part of Guidance Fundamentals II
12/4/2023	Time to Go Estimation Part 1	Patreon Exclusive	1. 35 minute video preview (ad-free)	Supports Guidance Fundamentals II
11/12/2023	Flare Path Control – Now Available	Automatic Flare Path Control – Flight Control Fundamentals – Section 1.6.5	1. Flare path control design scripts	Part of the Longitudinal Flight Control Series
10/22/2023	Flare Path Tutorial Part C – Initial Tuning	Patreon Exclusive	1. 26 minute video tutorial (ad-free) 2. Scripts for tutorial	Supports the Longitudinal Flight Control Series
10/22/2023	Flare Path Tutorial - Part B – Code Tutorial	Patreon Exclusive	1. 29 minute video tutorial (ad-free) 2. Scripts for tutorial	Supports the Longitudinal Flight Control Series
10/22/2023	Flare Path Tutorial – Part A – Math & Control Architecture	Patreon Exclusive	1. 32 minute video tutorial (ad-free) 2. Scripts for tutorial	Supports the Longitudinal Flight Control Series
9/26/2023	Flare Path Control – Lesson Preview	Patreon Exclusive	1. 12 minute video tutorial (ad-free)	Supports the Longitudinal Flight Control Series
9/3/2023	Full Lesson and Code Now Available (Glide Path Control)	Glide Path Control – Section 1.6.4	1, 32 minute video 2. Longitudinal Simulation Version 1.9b	Supports the Longitudinal Flight Control Series
8/23/2023	How to add a controller to the simulation	Longitudinal Flight Control Series	1. 38 minute video tutorial	Supports the Longitudinal Flight Control Series

7/23/2023	Simulation Version 1.8 with Video Tutorial	Longitudinal Flight Control Series	1. Longitudinal Simulation Version 1.8 in Matlab and Octave 2. 52 minute video tutorial	Supports the Longitudinal Flight Control Series
7/9/2023	Airspeed Control Now Available	Airspeed Control – Section 1.6.3	Set of scripts to analyze airspeed control systems	Supports the Longitudinal Flight Control Series
6/19/2023	Lead Compensated Aircraft Pitch Control (w/codes)	Lead Compensation for Aircraft Pitch Control – Section 1.6.2	1. Lead compensation pitch control design script with animations 2. SISO bode script	Supports the Longitudinal Flight Control Series
6/4/2023	Lead Compensation for Aircraft Pitch Control	Lead Compensation for Aircraft Pitch Control – Section 1.6.2	1. 19 minute lesson preview, 2. Lead compensation pitch control design script	Lesson preview, not final video lesson.
5/19/2023	How to Write Compensators in State Space Form	Transform a Lead/Lag Compensator into State Space	1. Scripts for the lesson, 2. Slides for of lesson	Part of Quick Control Concepts Series
4/23/2023	Trim to Cruise	Trim for Autopilot Development Section 1.7	1. 19 minute video tutorial on trimming to a cruise condition	Supports the Longitudinal Flight Control Series
4/22/2023	Trim – Flight Control Fundamentals Section 1.7	Trim for Autopilot Development Section 1.7	1. 44 minute video tutorial on trim in the simulation, 2. Longitudinal Flight Simulation Version 1.7	Supports the Longitudinal Flight Control Series
3/28/2023	Landing Guidance and Control	Landing Guidance and Control Section 1.6.1	1. Slides used to create video	Part of Longitudinal Flight Control Series

List Current as of March 21st, 2026 (New content may exist on Patreon ahead of this list being updated)

3/4/2023	[Code for How Zeros Affects Transients](#)	[How Zeros Affect Transient Response](#)	1. [Scripts used to create the lesson](#)	Part of [Quick Control Concepts](#) Series
2/12/2023	[Acceleration Control – FCF Section 1.5](#)	[Acceleration Tracking - Section 1.5](#)	1. [Longitudinal simulation version 1.6](#) 2. [Control design comparison script](#) 3. [SVPLOT](#)	Lesson preview, further developed codes available with lesson posting
1/19/2023`	[All Scripts from "Guidance from Optimal Control"](#)	[Guidance from Optimal Control](#)	1. [Augmented Proportional Navigation Scripts](#)	The corresponding lesson is Section 2, Module 3
1/16/2023	[All Codes for "Quick Concepts in Control"](#)	[Quick Controls Concepts](#)	1. [Matlab/ Octave script for "The Closed Loop Transfer Function" video.](#)	At the time of this posting, only one QCC lesson was posted.
1/16/2023	[All Scripts Used in Flight Control Fundamentals](#)	[Longitudinal Flight Control Fundamentals](#)	1. [All scripts](#) 2. [Link to 50 minute tutorial on how to use the simulation and control scripts.](#)	All scripts up to January 16th. Future lessons and posts occur throughout
01/16/2023	[All Codes for Missile Guidance Fundamentals](#)	[Guidance Fundamentals I](#)	1. [All codes for Guidance Fundamental series.](#) 2. [Tutorial on how to run scripts](#)	All codes for Guidance Fundamental series for Octave or Matlab.