

## 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](http://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

|                                       |  |
|---------------------------------------|--|
| Guidance                              |  |
| Longitudinal Flight Control           |  |
| Lateral Flight Control                |  |
| 6-DOF Simulation Development Tutorial |  |
| Quick Concepts in Control             |  |

| Patreon Post Date | Patreon Post Title                                        | Corresponding LearnGandC.com /YouTube Video Lesson Title                        | Patreon Post Contents                                                 | Additional Comments                                   |
|-------------------|-----------------------------------------------------------|---------------------------------------------------------------------------------|-----------------------------------------------------------------------|-------------------------------------------------------|
| 5/9/2025          | <a href="#">Sideslip &amp; Sideslip Rate Feedback for</a> | <a href="#">Sideslip Rate Feedback for Improved Turn Coordination – Lateral</a> | 1. <a href="#">Written notes</a> ,<br>2. <a href="#">Design codes</a> | Part of <a href="#">Lateral Flight Control</a> Series |

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|------------|-----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|
|            | <a href="#">Improved Turn Coordination</a>                                                                            | <a href="#">Flight Control – Section 1.3</a>                                                                        |                                                                                                                                            |                                                           |
| 4/18/2025  | <a href="#">Terminal Attitude Trajectory Shaping Guidance</a>                                                         | <a href="#">Attitude Trajectory Shaping Guidance – Guidance Fundamentals II</a>                                     | 1. <a href="#">Written notes</a> , 2. <a href="#">Linear simulation codes</a> , 3. <a href="#">Nonlinear simulation codes</a>              | Part of <a href="#">Guidance Fundamentals II</a> series   |
| 3/2/2025   | <a href="#">Lateral Flight Control: Automatic Turn Coordination - Section 1.2</a>                                     | <a href="#">Automatic Turn Coordination   Adverse Yaw   Lateral Dynamics   Lateral Flight Control – Section 1.2</a> | 1. 31 minute video lesson (ad-free), 2. <a href="#">Octave codes/scripts</a> , 3. <a href="#">Written technical notes for the lesson</a> . | Part of the <a href="#">Lateral Flight Control Series</a> |
| 1/27/2025  | <a href="#">Section 3.2 Building a 6-DOF Aircraft Model from Open Literature: A Step-by-Step Guide Using the X-15</a> | <a href="#">How to Build an X-15 Aircraft Model from Literature</a>                                                 | 1. 49-minute video lesson 2. Updated <a href="#">Python Flight Simulation v0.2.0</a>                                                       | Part of <a href="#">6DOF Simulation Tutorial Series</a>   |
| 12/18/2024 | <a href="#">Dutch Roll Control – Section 1.1</a>                                                                      | <a href="#">Dutch Roll Damping – Section 1.1</a>                                                                    | 1. 20 minute video lesson (ad-free) 2. <a href="#">Dutch roll damping design scripts</a>                                                   | Part of <a href="#">Lateral Flight Control Series</a>     |
| 11/16/2024 | <a href="#">X-15 Stability Augmentation</a>                                                                           | <a href="#">X-15 Stability Augmentation System, Section 3.1</a>                                                     | 1. <a href="#">Video lesson</a> ad-free 2. <a href="#">Python Flight Simulation v0.1.1</a>                                                 | Part of <a href="#">6DOF Simulation Tutorial Series</a>   |
| 10/20/2024 | <a href="#">Section 2.2.4 Python Flight Simulation Update</a>                                                         | Patreon Exclusive                                                                                                   | 1. 23 minute video tutorial (ad-free) 2. <a href="#">Python Flight Simulation v0.1.0</a>                                                   | Part of <a href="#">6DOF Simulation Tutorial Series</a>   |

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| 9/29/2024 | <a href="#">Section 2.2.3 X-15 Flight Model Development</a>       | Patreon Exclusive                                                                                                      | 1. 17 minute video tutorial (ad-free) 2. <a href="#">Python Flight Simulation for Section 2.2.3</a> | Part of <a href="#">6DOF Simulation Tutorial Series</a>  |
| 9/8/2024  | <a href="#">Section 2.2.2 Initial X-15 Flight Simulation</a>      | Patreon Exclusive                                                                                                      | 1. 36 minute video tutorial (ad-free) 2. <a href="#">Python Flight Simulation for Section 2.2.2</a> | Part of <a href="#">6DOF Simulation Tutorial Series</a>  |
| 8/25/2024 | <a href="#">Section 2.2.1 X-15 Aero Model Development</a>         | Patreon Exclusive                                                                                                      | 1. 15 minute video tutorial (ad-free)                                                               | Part of <a href="#">6DOF Simulation Tutorial Series</a>  |
| 8/10/2024 | <a href="#">Section 2.1 X-15 Systems Review for 6DOF Model</a>    | <a href="#">X-15 Systems Review for Model Development – Section 2.1</a>                                                | 1. 29 minute video lesson (ad-free)                                                                 | Part of <a href="#">6DOF Simulation Tutorial Series</a>  |
| 7/5/2024  | <a href="#">Section 1.5 – Flight Simulation Development</a>       | <a href="#">Flying Bricks   6-DOF Verification   Aerodynamic Damping   Flight Simulation Tutorial   Section 1.5</a>    | 1. 21 minute video lesson (ad-free) 2. <a href="#">Python Flight Simulation for Section 1.5</a>     | Part of <a href="#">6DOF Simulation Tutorial Series</a>  |
| 6/19/2024 | <a href="#">Preview: Section 1.5 6DOF Simulation Development</a>  | Patreon Exclusive                                                                                                      | 1. 38 minute preview/tutorial (ad-free) 2. Draft of Python Flight Simulation for Section 1.5        | Supports <a href="#">6DOF Simulation Tutorial Series</a> |
| 6/8/2024  | <a href="#">Aircraft Simulation Tutorial Section 1.4 Released</a> | <a href="#">Navigation Equations   Atmosphere   Aerodynamics   Angle of Attack/Sideslip   Flight Sim - Section 1.4</a> | 1. 35 minute video lesson link 2. <a href="#">Python Flight Simulation for Section 1.4</a>          | Part of <a href="#">6DOF Simulation Tutorial Series</a>  |
| 5/13/2024 | <a href="#">Section 1.4 Flight Simulation Series Preview</a>      | Patreon Exclusive                                                                                                      | 1. 46 minute preview/tutorial (ad-free) 2. Draft of Python Flight Simulation for Section 1.4        | Supports <a href="#">6DOF Simulation Tutorial Series</a> |

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| 5/3/2024   | <a href="#">Aircraft Simulation with Euler Kinematics Section 1.3</a> | <a href="#">Aircraft Euler Kinematics (Attitude) Simulation in Python – Flight Simulation Tutorial - Section 1.3</a>    | <a href="#">Python Flight Simulation for Section 1.3</a>                       | Part of <a href="#">6DOF Simulation Tutorial Series</a>         |
| 4/7/2024   | <a href="#">Aircraft 6-DOF Development Section 1.2</a>                | <a href="#">Aircraft 6-DOF Equations and Coding in Python – Aircraft Flight Simulation Tutorial – Section 1.2</a>       | <a href="#">Python Flight Simulation for Section 1.2</a>                       | Part of <a href="#">6DOF Simulation Tutorial Series</a>         |
| 3/9/2024   | <a href="#">Aircraft Simulation Tutorial - Introduction</a>           | <a href="#">Six Degree of Freedom 6-DOF Aircraft Flight Simulation Tutorial - Introduction - Section 1.1</a>            | YouTube or LearnGandC.com Video Lesson                                         | First lesson in <a href="#">6DOF Simulation Tutorial Series</a> |
| 2/10/2024  | <a href="#">Statistics of Noisy Signals for Kalman Filters</a>        | <a href="#">Probability &amp; Statistics of Noisy Signals for Kalman Filters, Guidance Fundamentals II, Section 1.2</a> | 1. <a href="#">Code used to create the video lesson</a>                        | Part of <a href="#">Guidance Fundamentals II</a>                |
| 1/6/2024   | <a href="#">Time to Go Estimation Part 2 (The final product)</a>      | <a href="#">Time to Go Estimation - Guidance Fundamentals II - Section 1.1</a>                                          | 1. <a href="#">Set of 7 scripts used to create the lesson</a> (bottom of page) | Part of <a href="#">Guidance Fundamentals II</a>                |
| 12/4/2023  | <a href="#">Time to Go Estimation Part 1</a>                          | Patreon Exclusive                                                                                                       | 1. 35 minute video preview (ad-free)                                           | Supports <a href="#">Guidance Fundamentals II</a>               |
| 11/12/2023 | <a href="#">Flare Path Control – Now Available</a>                    | <a href="#">Automatic Flare Path Control – Flight Control Fundamentals – Section 1.6.5</a>                              | 1. <a href="#">Flare path control design scripts</a>                           | Part of the <a href="#">Longitudinal Flight Control Series</a>  |
| 10/22/2023 | <a href="#">Flare Path Tutorial Part C – Initial Tuning</a>           | Patreon Exclusive                                                                                                       | 1. 26 minute video tutorial (ad-free) 2. <a href="#">Scripts for tutorial</a>  | Supports the <a href="#">Longitudinal Flight Control Series</a> |

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| 10/22/2023 | <a href="#">Flare Path Tutorial - Part B – Code Tutorial</a>                   | Patreon Exclusive                                                            | 1. 29 minute video tutorial (ad-free) 2. <a href="#">Scripts for tutorial</a>                                                           | Supports the <a href="#">Longitudinal Flight Control Series</a> |
| 10/22/2023 | <a href="#">Flare Path Tutorial – Part A – Math &amp; Control Architecture</a> | Patreon Exclusive                                                            | 1. 32 minute video tutorial (ad-free) 2. <a href="#">Scripts for tutorial</a>                                                           | Supports the <a href="#">Longitudinal Flight Control Series</a> |
| 9/26/2023  | <a href="#">Flare Path Control – Lesson Preview</a>                            | Patreon Exclusive                                                            | 1. 12 minute video tutorial (ad-free)                                                                                                   | Supports the <a href="#">Longitudinal Flight Control Series</a> |
| 9/3/2023   | <a href="#">Full Lesson and Code Now Available (Glide Path Control)</a>        | <a href="#">Glide Path Control – Section 1.6.4</a>                           | 1, 32 minute video 2. <a href="#">Longitudinal Simulation Version 1.9b</a>                                                              | Supports the <a href="#">Longitudinal Flight Control Series</a> |
| 8/23/2023  | <a href="#">How to add a controller to the simulation</a>                      | <a href="#">Longitudinal Flight Control Series</a>                           | 1. 38 minute video tutorial                                                                                                             | Supports the <a href="#">Longitudinal Flight Control Series</a> |
| 7/23/2023  | <a href="#">Simulation Version 1.8 with Video Tutorial</a>                     | <a href="#">Longitudinal Flight Control Series</a>                           | 1. Longitudinal Simulation Version 1.8 in <a href="#">Matlab</a> and <a href="#">Octave</a> 2. <a href="#">52 minute video tutorial</a> | Supports the <a href="#">Longitudinal Flight Control Series</a> |
| 7/9/2023   | <a href="#">Airspeed Control Now Available</a>                                 | <a href="#">Airspeed Control – Section 1.6.3</a>                             | <a href="#">Set of scripts to analyze airspeed control systems</a>                                                                      | Supports the <a href="#">Longitudinal Flight Control Series</a> |
| 6/19/2023  | <a href="#">Lead Compensated Aircraft Pitch Control (w/codes)</a>              | <a href="#">Lead Compensation for Aircraft Pitch Control – Section 1.6.2</a> | 1. <a href="#">Lead compensation pitch control design script with animations</a> 2. <a href="#">SISO bode script</a>                    | Supports the <a href="#">Longitudinal Flight Control Series</a> |

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| 6/4/2023   | <a href="#">Lead Compensation for Aircraft Pitch Control</a>   | <a href="#">Lead Compensation for Aircraft Pitch Control – Section 1.6.2</a> | 1. 19 minute lesson preview, 2. <a href="#">Lead compensation pitch control design script</a>                                        | Lesson preview, not final video lesson.                               |
| 5/19/2023  | <a href="#">How to Write Compensators in State Space Form</a>  | <a href="#">Transform a Lead/Lag Compensator into State Space</a>            | 1. Scripts for the lesson, 2. Slides for of lesson                                                                                   | Part of <a href="#">Quick Control Concepts Series</a>                 |
| 4/23/2023  | <a href="#">Trim to Cruise</a>                                 | <a href="#">Trim for Autopilot Development Section 1.7</a>                   | 1. 19 minute video tutorial on trimming to a cruise condition                                                                        | Supports the <a href="#">Longitudinal Flight Control Series</a>       |
| 4/22/2023  | <a href="#">Trim – Flight Control Fundamentals Section 1.7</a> | <a href="#">Trim for Autopilot Development Section 1.7</a>                   | 1. 44 minute video tutorial on trim in the simulation, 2. <a href="#">Longitudinal Flight Simulation Version 1.7</a>                 | Supports the <a href="#">Longitudinal Flight Control Series</a>       |
| 3/28/2023  | <a href="#">Landing Guidance and Control</a>                   | <a href="#">Landing Guidance and Control Section 1.6.1</a>                   | 1. <a href="#">Slides used to create video</a>                                                                                       | Part of <a href="#">Longitudinal Flight Control Series</a>            |
| 3/4/2023   | <a href="#">Code for How Zeros Affects Transients</a>          | <a href="#">How Zeros Affect Transient Response</a>                          | 1. <a href="#">Scripts used to create the lesson</a>                                                                                 | Part of <a href="#">Quick Control Concepts Series</a>                 |
| 2/12/2023  | <a href="#">Acceleration Control – FCF Section 1.5</a>         | <a href="#">Acceleration Tracking - Section 1.5</a>                          | 1. <a href="#">Longitudinal simulation version 1.6</a> 2. <a href="#">Control design comparison script</a> 3. <a href="#">SVPLOT</a> | Lesson preview, further developed codes available with lesson posting |
| 1/19/2023` | <a href="#">All Scripts from “Guidance</a>                     | <a href="#">Guidance from Optimal Control</a>                                | 1. <a href="#">Augmented Proportional</a>                                                                                            | The corresponding lesson is                                           |

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|            | <a href="#">from Optimal Control”</a>                           |                                                          | <a href="#">Navigation Scripts</a>                                                                                             | Section 2, Module 3                                                                    |
| 1/16/2023  | <a href="#">All Codes for “Quick Concepts in Control”</a>       | <a href="#">Quick Controls Concepts</a>                  | 1. <a href="#">Matlab/ Octave script for “The Closed Loop Transfer Function” video.</a>                                        | At the time of this posting, only one QCC lesson was posted.                           |
| 1/16/2023  | <a href="#">All Scripts Used in Flight Control Fundamentals</a> | <a href="#">Longitudinal Flight Control Fundamentals</a> | 1. <a href="#">All scripts</a> 2. <a href="#">Link to 50 minute tutorial on how to use the simulation and control scripts.</a> | All scripts up to January 16 <sup>th</sup> . Future lessons and posts occur throughout |
| 01/16/2023 | <a href="#">All Codes for Missile Guidance Fundamentals</a>     | <a href="#">Guidance Fundamentals I</a>                  | 1. <a href="#">All codes for Guidance Fundamental series.</a> 2. <a href="#">Tutorial on how to run scripts</a>                | All codes for Guidance Fundamental series for Octave or Matlab.                        |