—NOTE: Due to the nature of my capstone, as it requires creating a physical product, many of the sources are media that provide guidance in such creation. There are, however, a variety of sources ranging from blog posts to articles to research papers.—

1) Dood, 3D Print. "The ONLY Bambu Studio Tutorial You Need - Beginners Guide!" YouTube, 16 August 2025, https://www.youtube.com/watch?v=Tc6xLuijLBg.
    a) This source provides information on how to 3D print, which is something I haven't dived too deep into during my time in CTE Engineering. This is vital to my capstone because the enclosure for the drone will be 3D designed and completely custom, meaning I need the necessary skills to print that design. Specifically, I am looking into Bambu Studio, which is the 3D printer that my capstone mentor primarily uses. Like many other sources in the form of media or recordings, it's difficult to replay various segments of the video if the tab is closed. Thus, it'll be important that I pay attention when watching initially and to ask my capstone mentor when help is needed.

2) FPV, PRIMITIVE. "How To Design A Drone Frame Fusion 360 Tutorial." 8 April 2020, https://youtu.be/DoC8GQmAyYM?si=X6NYuw7CNTNek6TJ.
    a) This source details how to design a drone frame from scratch within Autodesk Fusion 360, which is what I hope to use when designing my own frame. This goes through the steps for designing the various parts of the enclosure ranging from the arms to the bottom plate to the props attachment. It also made me reflect on the limitations of Fusion 360, as it's relatively difficult to design components that include curvature and are more than extrusions with fillets. As such, I will also be looking into Blender, which is a 3D modeling software that I have used in the past. This'll allow me to make more complicated shapes for the enclosure, but I will be focusing on designing the initial version within Fusion 360 using the guidance and tips from this source.

3) "How Do Public Safety Drones Help Law Enforcement?" Flock Safety, 12 May 2025, https://www.flocksafety.com/blog/public-safety-drones.
    a) This news article details the ways that drones have been used to help law enforcement when policing. Since the impact of my project is adjacent to that, as it deals with helping school security officers in the case of a school shooting, this gives me a better understanding of its positive influence in aiding citizens—or in my case, students. One example that I thought was particularly applicable to my project was how drones were able to improve operational decision-making. This was the case for the Oklahoma police department who was able to locate a suspect reaching for a firearm during a standoff, allowing them to react efficiently and appropriately. In the case of a lockdown, drones can be used to gather

information, which is vital in these scenarios.

4) Imagination, Max. “Build The Smallest ESP32 Drone You Can Fly with Your Phone! (ESP-FLY).”16 March 2025, https://www.youtube.com/watch?v=V_mZsiZcy7s.
    a) This is my main inspiration for my capstone. It details the general procedure for building a drone using an ESP32—which is what I’m using—, providing me with more structure as I begin to start on the electronics and the circuitry part of my capstone. My project, however, will not be a copy of this project. While this source does provide much structure and guidance for the circuitry and software, the area where my specific project will divert is with the drone’s enclosure. I will have to design my own frame with hopes to make it compact and durable. This, however, is fine because directly copying a project would be unproductive to my use case anyway.

5) Mollica, Christian. FPV Flight Dynamics: Mastering Acro Mode on High-Performance Drones. Vespula Ventures LLC, 2020, https://dokumen.pub/fpv-flight-dynamics-mastering-acro-mode-on-high-performance-drones-1nbsped-9781736209400-9781736209417-w-5705445.html.
    a) This book discusses FPV flight dynamics or in other words, provides details on why quadcopters stay in the air. This is different from the NASA source below, as it provides more information and details into the specifics of flight, which is something the latter only does briefly. This is also focusing on FPV (first person view) drones, which is what I hope to implement for my capstone. This means that it’s more applicable to my project than the other source was and it deepens my knowledge in this topic based on the basic information I have already gathered. This is a downside, however; because there is so much information, it’s hard to choose what is important for me, so skimming will need to be done to figure that out.

6) Peterson, Zachariah. “How to Design a Printed Circuit Board in 10 Easy Steps.” Altium Resources, 31 August 2018, https://resources.altium.com/p/10-easy-steps-comprehensively-designing-circuit-board-altium-designer.
    a) While discussing with my capstone mentor, we both came to the conclusion that it made more sense to design a Printed Circuit Board (PCB), as that would be more compact and lighter. Mass plays a big role in whether the aircraft will generate enough lift to stay in the air, which is why I want to minimize it where I can. This source shows all the steps required to design a PCB. This circuit board will encompass the entirety of the circuitry aspect of my drone, meaning that it’s crucial that this gets done so that the rest of the project may progress. This is a

rather broad scope for designing PCBs, so I'm unsure if there are additional steps when it comes to my specific project.

7) Rehm, Nicholas. "GPS-Denied, Anti-Jam Autonomous DIY Drone: How It Works." YouTube, 19 October 2021, https://www.youtube.com/watch?v=p8frNNYQNV4.
    a) When narrowing down the focus of my capstone from a broader scope, which was custom drones as a whole, I stumbled upon this video. Since I had originally envisioned my project to be centered around Computer Visions and aerial technology, this video gave me more perspective into the different ways I can take my capstone project. This source detailed the composition of an example project of a drone that can be used in scenarios where there are no GPS signals. While this isn't immediately applicable to my new vision for my capstone, I was provided with more alternatives when adding new features. Specifically, since the scope of my project is within the prevention of school shootings and lockdowns, adapting something that can be used outside of just WiFi. The specific scenario where I envision my physical product to be used would be in emergency situations so there's a need for the capstone to be as quality and that situations where GPS is limited is also accounted for.

8) "STEM LEARNING: Advanced Air Mobility: The Science Behind Quadcopters Reader—Student Guide." NASA, 2020, https://www.nasa.gov/wp-content/uploads/2020/05/aam-science-behind-quadcopters-reader-student-guide_0.pdf.
    a) This is an article created by NASA and it shows the physics behind quadcopters, more commonly referred to as drones. It shows the various forces that would act on a drone and from that, I can infer what needs to be tweaked to ensure flight. More importantly, it shows how the propellers would act and the placement of props in a way that ensures the aircraft lifts off (props diagonal to each other spin in the same direction). This will be especially useful to keep in mind when I'm attaching the props when making my drone and providing more information on why this has to be. While this source provides a lot of background information in terms of understanding why the various components act the way they do, it doesn't explicitly show how to do this, which is a downside of this source.

9) Tactical, Hoffman. "How I Designed an Indestructible Quadcopter Frame." 16 June 2025, https://www.youtube.com/watch?v=adPwNKBte5c.
    a) This source gives an example project where someone designed a durable drone frame. While this frame is much larger than the one I need for my project, there are elements that I can use for my own. For example, the shape of the arms of his drone are optimized to maximize airflow and mass. My goal for my frame is to

design something that optimizes both airtime and durability, which is why I'll be using elements from this source. A downside is most definitely the size of this frame, as you have to adjust components when scaling done so I'd have to design my own frame anyway.

10) Teel, John. "How to design your first PCB (in less than 10 minutes)." 23 January 2025, https://www.youtube.com/watch?v=0cwvYz2HmLw.
    a) This source also details how to design a PCB, though this is different from the third source, as it includes visuals while going through the process. It goes through an example of actually designing a PCB, which is also an improvement from the broad instructions found in the third source. From what I've seen so far, however, designing my PCB should be relatively similar to the one in this video in terms of using the same software. The complexity may differ, but the principles outlined here will still be applicable when designing my circuit. It also gives some baseline information into the different parts that make up a PCB, which is a good refresher since it's been a while since I designed circuits.