

12/20/2025

To whom it may concern,

It is my pleasure to write this letter of recommendation for John Francis Zech, whom I have known for the past one year as an undergraduate student in the Department of Mechanical and Materials Engineering at the University of Alabama at Birmingham (UAB).

I am an Associate Professor in the Department of Mechanical and Materials Engineering at UAB. I hold a Ph.D. in Aerospace Engineering, and my research focuses on computational fluid dynamics (CFD). I have spent close to three decades working in the Aerospace Engineering field both in industry and as a researcher and professor specializing in fluid dynamics and computational fluid modeling. Over my tenure at UAB, I have served in various capacities, including as an instructor for undergraduate and graduate courses, Undergraduate Program Director, Graduate Program Director, Director of the Mechanical Engineering Honors Program, and as a research mentor. These roles have afforded me the opportunity to evaluate numerous students, and I am confident in my assessment of John Francis's capabilities and potential.

The first time I interacted closely with John Francis was during Spring 2025, when he was enrolled in the "Intermediate Fluid Mechanics" course that I offered. I immediately recognized a rare level of preparation and focus. Before attending the lecture, he had researched my academic background, my graduate work, and had even familiarized himself with portions of my published research. At the end of that first class, he approached me not to ask routine questions, but to express genuine interest in joining any ongoing research project I might have. Such initiative is striking in any student, let alone one in an introductory course.

Throughout the semester, John Francis was consistently inquisitive, engaged, and technically motivated. In the classroom, his questions demonstrated his eagerness to find mathematical solutions to fluid flow problems. Outside of class, he independently read through my team's NIH grant research and began familiarizing himself with the ANSYS CFD suite. Our one-on-one discussions ranged from the specifics of our biomedical simulations to broader insights into the aerospace research landscape, including grant structures and emerging technical fields. As the semester progressed, he shared with me his growing desire to shift toward aerospace work—an early sign of his self-awareness and professional clarity.

At the end of that first semester, John Francis turned his attention toward building an aerospace presence at a university that lacked a formal aerospace program. Rather than accepting this limitation, he partnered with doctoral candidates in chemistry and physics to establish UAB's first Rocket Club. Throughout the spring, he coordinated meetings, recruited students from engineering, physics, biology, chemistry, math, and business. They co-authored the club's application for funding through the Alabama Space Grant Consortium. By the end of the term, after establishing a regular meeting schedule with more than two dozen interested students, the club secured \$5,000 in grant funding—an impressive achievement for an organization founded three months prior.

As president, John Francis continued building momentum throughout the summer, raising more than \$3,500 from over 15 private contributors, while guiding the club's preparations to enter NASA's school year long University Student Launch Initiative (USLI) culminating in an April 2026 competition in Huntsville. He personally drafted a proposal to create a senior design team of graduating mechanical, material, and design engineers, which was approved and ultimately led to win the interest of over ten capstone students at the start of the fall semester. He leads a dedicated team of four committed to the Rocket Club's payload capstone project, securing an additional \$1,200 in funding for the team in hardware.

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During this time, John Francis's technical skills kept pace with his organizational leadership; in my Computational Fluid Dynamics course this fall, his applied understanding of CFD modeling and aerospace-relevant flow phenomena had deepened substantially. In the classroom, his questions reached far beyond the surface level, as he probed deeper into viscous flow behaviors, boundary-layer assumptions, and turbulence modeling. I noticed another key focus when the subject of lift, drag, and stall characteristics of airfoils with varying geometries arose. This focus married his theoretical understanding of the physics behind flight with over 20 hours of flight training in the cockpit while earning his student private pilot solo flight endorsement.

By the end of the semester, John Francis had recruited yet another group of students in class to conduct an in-depth aerodynamic stability analysis of the team's rocket design in preparation for upcoming flight stability testing in the spring. As team lead of this project, his peers regularly sought his explanations about rocketry and flight dynamics in general, recognizing his skill in that domain and appreciate his clear communication.

His ability to connect with others, motivate them around a common technical objective, and sustain their engagement was consistently evident. These interpersonal strengths, paired with his technical capability, adaptability, and genuine enthusiasm for aerospace engineering, make him stand out among the hundreds of students I have taught.

Throughout my career of mentoring future engineers, I have learned how to identify individuals who will provide immediate and meaningful contributions to any aerospace team. John Francis is one of those rare individuals. His passion is authentic, his initiative is continuous, and his capacity to grow is exceptional. I recommend him to your organization without hesitation and with complete confidence that he will exceed expectations from the moment he arrives.

If you have any further questions, please feel free to contact me at (205) 934-0832 or rkoomul@uab.edu

Sincerely,



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