### University of Notre Dame College of Engineering UAVND Club Charter

### 1. Document Summary

This document describes the relationship between the University of Notre Dame College of Engineering and the Unmanned Aerial Vehicles Club of Notre Dame (UAVND). It outlines the purpose of UAVND, the Engineering Department's role in club oversight, and offers a yearly plan of club activities.

### 2. Mission Statement

UAVND seeks to provide students interested in unmanned aerial vehicles (UAVs) with the ability to act on their interest and explore the professional world surrounding this rapidly expanding field. Students will be given the opportunity to interact with faculty advisors and industry experts who have worked with UAVs.

The field of autonomous flight is one that is becoming increasingly regulated by local, state, and national entities like the FAA (Federal Aviation Administration). As such, it is critical for someone looking to enter the industry to acquire a certain level of familiarity with the intricacies of current regulations and where to find out about future modifications. In addition, UAVND will harness technical ability, critical teamwork fundamentals, impassioned leadership, and professional engineering development through the design of complex unmanned vehicle systems. UAVND will teach members to persevere toward a common goal. It will help develop members' ability to withstand and bounce back from failure. Because its efforts are not affiliated with a grade, UAVND derives organic work ethic from sheer passion. Built on a foundation of curiosity



and hard work, UAVND will allow its members to explore this industry in ways that traditional classroom instruction struggles to provide.

### 3. Management & Oversight Structure

The University of Notre Dame College of Engineering will endorse UAVND as an engineering club. This endorsement means that the College of Engineering will be active in the process of selecting and approving a faculty advisor, accept some liability for UAVND activities, and must approve an updated club charter yearly. In the case of a faculty advisor change, the members of UAVND will elect a new advisor in accordance with the UAVND constitution. Then, the College of Engineering administration must approve of the choice. Doing so will signify that the College of Engineering acknowledges that the selected advisor is capable of providing the Club with sufficient technical expertise and guidance. There may be more than one faculty advisor. However, every faculty advisor must undergo the approval process with the College of Engineering.

An industry advisor may also work with the Club. That being said, due to the fact that the industry advisor's presence does not directly affect proper club operations over the course of the year, their appointment does not need to be formally confirmed by the College of Engineering. Also, it is preferable, not required, that the Club possesses an industry advisor. Having an involved industry advisor helps satisfy the UAVND's professional development mission. Seeing that UAVND will reside under the jurisdiction of the College of Engineering, the college will accept the liability associated with club activities beyond what is covered by the Academy of Model Aeronautics (AMA) membership or by individual competitions. For UAVND to retain the College of Engineering's endorsement, an updated version of the club charter is to be submitted to and approved by the College of Engineering administration annually. At the beginning of the



fall semester, a version of the club charter with a timeline, budget overview, manufacturing, storage, and testing plan for the year must be approved by the College of Engineering for UAVND to continue operation. The following diagram illustrates the management oversight structure for the Club.



## 4. Competition Selection

The method of choosing competitions will begin as an internal process within UAVND. Any Club member can suggest a competition. At the beginning of the spring semester, suggestions will be compiled and voted on by UAVND members with the treasurer and safety officer holding



veto power if a competition is deemed too dangerous or prohibitively expensive. This internal process will wrap up during the conclusion of the spring semester in order to select competitions for the next school year. These competitions will then be added to the next year's updated UAVND charter and must be approved by the College of Engineering at the beginning of the fall semester.

### 5. Annual Timeline

As a student organization at the University of Notre Dame, UAVND is expected to host a certain number of events every year in order to be considered an active group. The following figure illustrates the events that UAVND will host in order to fulfill the aforementioned quota. Competitions are included in the quota; however, public events involving on-campus and local communities in addition to public talks given on campus by industry experts will comprise the majority of the events. Due to the fact that UAVND will be undergoing SAO's official student organization approval process during the fall semester of 2020, club sanctioned events will be primarily concentrated in the spring of 2021. That being said, club activities during the fall will generally involve design work, competition selection, and document compilation. Once SAO's approval has been obtained and officer training has been completed as required, the Club will begin meeting on a biweekly basis. The manufacturing of vehicles designed in the fall and preparation for the selected competitions will begin. All UAVND members will be expected to adhere to the attendance policies discussed in the club constitution. Failure to respect these requirements will result in membership being suspended.





# 6. Brief Budget Overview

This section briefly describes the UAVND budget plan for the upcoming year. It will outline approximately how much money is expected from the College of Engineering, corporate sponsors, and the CCC (Club Coordination Council) as well as where this money is going to be spent.

By a substantial margin, the largest portion of this year's budget is made up of supplies. As a newly formed club, a part and tool inventory will need to be formed from scratch with many elements being one time purchases. Aside from supplies, licenses, certifications, and competition fees are the other large costs. Due to the fact that we do not have any corporate sponsorships currently, we expect much of our funding to come from the College of Engineering initially.



After the organization is approved by SAO, corporate sponsorships for parts and monetary funding will be sought out. Likewise, should the selected competitions properly align with the purpose for which a given grant was obtained, our faculty advisor may allow us to utilize portions of it for funding. Any revenue provided by the Club Coordination Council will be primarily used to fund licenses for Club members. A nonexhaustive table containing expected expenses for the upcoming year is provided below.

Type of Expense	Amount
Flyers/Posters	\$100
Table Tents/Banners	\$100
UAV Supplies	\$2,500
AMA Membership Costs	\$225
FAA Licenses	\$200
Competition Fees	\$1,500
Travel	\$2,500
Total Expenses	7,125

## 7. Manufacturing

As an engineering design club that will be involved in competitions requiring hardware, UAVND will be involved with the manufacturing of parts. Being primarily involved with multirotors and fixed wing UAVs, the Club will need access to a midsized lab because the space and tool requirements for building fixed wing and multirotor UAVs differ substantially.



Although the avionics are generally similar between the various classes of aircraft that fall under the UAV designation, the physical airframes differ substantially. As such, the Club must find a workspace that is able to accommodate the manufacturing of whatever class of aircraft the selected competition's specifications favor. Before undertaking the manufacturing of a new UAV, UAVND should submit a project proposal to the College of Engineering. This proposal will outline the budget breakdown for the aircraft and the facilities necessary for its successful completion.

#### \*\*insert manufacturing plan (Rooms/Labs/Tools Available)\*\*

### 8. Storage

The Club's property (e.g. UAVs, tools, ground control stations) will be stored on campus in a lockable space obtained through and approved by the College of Engineering. If the decision is made to store the aircraft off campus (i.e. not in the agreed upon lockable space) at an AMA field as was offered to the Club by a local group, a simple contract needs to be written up by UAVND and submitted to the College of Engineering and operator of the AMA field. This will be done in order to solidify the protocol undertaken in the case that equipment stored off campus is damaged, stolen, or misappropriated by the field owner or operator.

### \*\*insert storage plan (Rooms/Labs Available)\*\*

### 9. Testing

Testing of UAVs will be done at a licensed AMA field with the direct written approval of the field administrator. This written approval will be reacquired every calendar year. Before flying at a new field, UAVND members must obtain written approval. The guidelines outlining flying



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procedures and club regulations are outlined in the UAVND Safety Handbook. As is outlined in the aforementioned document, no physical testing will be undertaken by the Club until extensive testing in a reputable simulator has been completed (e.g. jMAVSim or Gazebo).

Field	Address	Contact	Email	Approval Letter
Tri Valley RC	61248, 61000 Peppermint Rd, South Bend, IN 46614, USA	Gary Shingledecker	<u>g.shingledecker</u> @comcast.net	Received July 12

## **10. Amendment Process**

The charter and safety protocol documents are meant to be fluid from year to year. As FAA, AMA, and University regulations change, the requirements to maintain safe club operations and College of Engineering endorsement are expected to change. This document is free to be amended by UAVND before being submitted to the College of Engineering each fall. After the document has been submitted, any amendments, either required by the College of Engineering or requested by UAVND, will be discussed in a meeting with a representative from the College of Engineering administration, the UAVND faculty advisor, and the UAVND officers. The safety protocol document is to be amended throughout the year with the approval of both the faculty advisor and the UAVND safety officer.

