Senior Capstone Project Proposal

The project is designed for a team of students working toward completion of a project, within two semesters[1].

Title	Project Dream Big
Sponsor	Contact person: Dillon Embry Company name: Nearspace Education
	Contact info: Dillon.embry@nearspaceeducation.org,
Description	Create a payload for a ½U satellite to be launched into low earth orbit (LEO) utilizing the pathways to space methodology. Complete three High altitude balloon launches to test the payload and provide outreach to the local schools and community. •Standard PC104 Format size and ~1in thick •Access to at least on side of satellite for standard view ports •Sensors must mount to the PC104 stack •Power •5v and 3.3v Regulated power supply •10min/hr @ .5A •Bus will shut off payload when battery discharges to 40% •6-9v 50mA direct from battery •.5w available •5wh of battery •Discharge to no less than 40% •1w from solar •Weight •+250g of payload weight •ADCS is optional •At the sacrifice of weight and volume •Sun pointing increases aval power •Sun sensor, horizon sensor •Temperature •Operational temperature •-20 °C to 20°C •Out of operation Temps •-40 °C to-20 °C and 20 °C to 80 °C •Requestable 200 Byte uplink •200 Byte Downlink

[1]In general, one semester has 15 weeks. For a 3 credit hours course, a student is expected to work minimum of 8 hours per week for the project which is equivalent to minimum of 120 hours.
[2]This information is for reference purposes only, and it will help us to identify a suitable faculty advisor and form student teams..

	•1 packet/hr in tumble average •1 per 15 sec max if stabilized
Disciplines (ME, EE, CS, etc.)	CS, EE, ME
For ECE	PCB design, analog circuit, signal conditioning, RF circuit, embedded system firmware. Python, C, C++, C#, Java, and Javascript.[2]
Estimated budget	The cost of launching the satellite, HAB, environmental testing, licensing, spacecraft frame and data associated will be covered. A $203,000 value The cost associated with the hosted payload is to be covered by university or other sponsors.
Technology Disclosed? If so, what?	Interface control document for Bus integration
Additional requirements	
NDA or IP Assignment agreement requested?	No

Technology and ECCN:
"If your project involves 'technology' that is either (a) not publicly available or (b) includes proprietary source code (not executable files), then it requires an ECCN." 'Technology,' for this purpose, is defined as "information necessary for the development, production, use, operation, installation, maintenance, repair, overhaul or refurbishing of an item. Technology may be in any tangible form, such as written or oral communications, blueprints, drawings, photographs, plans, diagrams, models, formulae, tables, engineering designs and specifications, computer-aided design files, manuals or documentation, electronic media or information revealed through visual inspection."

Interactive tool to determine ECCN:
https://www.bis.doc.gov/index.php/export-control-classification-interactive-tool

NDAs and IP Assignments:

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The sponsoring company typically has NDAs and IP assignment forms that it wishes to use. Neither the NDA nor the IP assignment is an agreement with Purdue directly; these agreements are between the students and the sponsoring company. Of course, our office can review the company-provided documents to be certain it aligns with Purdue's standards. Alternatively, our office has draft agreements which we could provide for the sponsor's use. Again, as NDAs are between the student and the sponsor, Purdue cannot be a party to or advise the sponsor or the student on the NDAs, other than to outline some basic expectations as to fairness and suitability of the NDA to a student project.

Sponsor Acknowledgements:
By way of background, Purdue University professors who have senior capstone class projects involving outside sponsor companies notify our office so that we can prepare an acknowledgement form for the sponsoring company's completion. This is not a contract but an acknowledgement form signed by sponsoring companies which lays out Purdue's guidelines regarding class projects and outside company inputs, potential export control issues, and student intellectual property. Some sponsoring companies offer a monetary donation to the project, but that is not a requirement.

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