****Completing this proposal with **care and consideration** is the first step towards a **successful** **Independent Study Project**. You have read [the underlying philosophy of the activity](http://darcy.rsgc.on.ca/ACES/ISPs/Hardware.html), explored various topics of pursuit, and have understood the [evaluation criteria](http://darcy.rsgc.on.ca/ACES/ISPs/LongISPEvaluationWithCOMMCADICS3U.docx). When fully completed, attach this document to an email to **ACESHandin**, by the deadline, under the Subject: **ISP.Long Proposal**

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| **1. Your Name** |  |
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| **2. Project Title** |  |
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| **3. General Description** |  |
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| **4. MCU (Highlight One)** |  |
| NONE | 84 | 85 | 328P | 2560 | ESP-12, ESP8266, | PHOTON | Teensy (32 bit ARM) | Other? UNO?, Nano?, etc… |

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| **5. Design Details (EasyEDA, Fusion360) , Acrylic, etc.)** |  |
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| **6. Communication Details (Serial, SPI, I2C, RF, IR, Bluetooth, WiFi, etc.)** |  |
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| **7. Mechanical Details (DC Motor, Servo, Stepper, Solenoid, etc.)** |  |
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| **8. Hand-Drawn Sketch of Your Imagining of the Final Prototype** |  |
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**NOTE: Be sure to check ALL the applicable boxes on Page 3.**

Please check all **additional** boxes corresponding to the skills you intend to exploit in this project.

|  |  |  |  |
| --- | --- | --- | --- |
| **Hardware Components** | **Software Techniques** | **Power** | **Skills** |
| □ resistors□ capacitors□ potentiometers□ transistors□ diodes□ push buttons□ switches□ LDRs□ thermistor□ temperature sensor□ IR proximity sensor□ **Op**erational **Amp**lifier□ voltage regulators□ MOSFETs□ Logic ICs (40xx)□ shift registers□ Specialty ICs (555, MSGEQ7, H-Bridge, LM3914, 24LC256, etc.)□ Real Time Clock (RTC)□ ATtiny84□ ATtiny85□ LEDs (single, Bi, RGB, neo)□ 7-segment display□ Alphanumeric display□ Bargraph□ LED Matrix□ LCD Panel□ Graphics Panel□ DC motor□ servo motor□ stepper motor□ solenoid □ microphone□ audio line in□ speaker□ magnets□ point-to-point board□ perma-proto board□ custom PCB□ OTHER | □ High-Level□ Assembly□ Arrays□ Structs□ bitwise operators□ I2C (TWI)□ Libraries□ ADC□ PWM□ Serial Comm. (ISP)□ Debouncing□ LookUp Table□ Polling□ Persistence of Vision□ Interrupts□ Recursion□ ISP□ EEPROM□ Processing□ Charlieplexing□ Timing related□ UML Design□ OTHER | □ Batteries□ AC/DC Adapter□ Transformers□ coils/chokes□ 12V□ 24V□ solar□ manual□ Peltier tiles□ OTHER | □ reading a schematic□ TH soldering□ SM soldering□ DMM Debugging☑ Fusion 360 □ 3D printing□ 2D acrylic fabrication□ PCB layout and manufacturing☑ Word□ Excel☑ Time-management□ Fritzing□ Presentation Overview☑ video creation☑ technical writing□ OTHER |
| **Communication** |
| □ (wired) Serial Comm.□ (wired) SPI□ (wired) I2C (aka. TWI)□ (wireless) RF□ (wireless) IR□ (wireless) Bluetooth |
| **Design** |
| □ TINKERCAD□ EASYEDA Simulation□ FUSION 360□ [JLCPCB](https://jlcpcb.com/)□ [Sawdust&Noise](http://www.wecut4u.com/laser_cutting/laser_cutting_service.html)(acrylic, wood)□ OTHER |
| **Engineering Fields**  |
| □ electrical□ computer□ mechanical□ software□ design□ OTHER |