Use this page to submit a proposal for your **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 assessment criteria (<http://darcy.rsgc.on.ca/ACES/ISPs/ISPEvaluation.docx>).

**1. Your Name:**

**2. Project Title:**

**3. Provide a brief description of the project, including DESIGN (EAGLE and/or CAD) :**

**4. What Communication Protocol(s) will you incorporate (tick boxes on reverse)?**

**5. Where did your inspiration for this project come from?**

**6. List Two Additional concepts, skills, and/or techniques you hope to improve/acquire in completing this project.**

 a)

b)

c) Computer Assisted Design and Fabrication (Highlight One or More): EAGLE PCB, 2D Laser Cut and/or 3D Print)

**7. For each of the criteria below, indicate a position on the range scale and add a comment if appropriate.**

**Feature Range (mark a position) Comment**

**a) Risk L H \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**b) Research L H \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**c) Originality L H \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**D) Collaboration L H \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**NOTE: Be sure to check ALL the applicable boxes on the reverse.**

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  □ [SHARP proximity](https://mail.rsgc.on.ca/~cdarcy/Datasheets/gp2y0a41sk_e.pdf) sensor □ [LM324](https://mail.rsgc.on.ca/~cdarcy/Datasheets/lm124-n.pdf) OpAmp  □ [LM7805](https://mail.rsgc.on.ca/~cdarcy/Datasheets/LM7805.pdf) Volt. Reg.  □ [TIP120](https://mail.rsgc.on.ca/~cdarcy/Datasheets/TIP120.pdf) Darlington □ [IRF520](https://mail.rsgc.on.ca/~cdarcy/Datasheets/IRF520.pdf) MOSFET  □ surface mount parts  □ Logic ICs (40xx) □ [74HC595](https://mail.rsgc.on.ca/~cdarcy/Datasheets/74HCT595.pdf) shift regs.  □ [LM555](https://mail.rsgc.on.ca/~cdarcy/Datasheets/lm555.pdf) Timer  □ [MSGEQ7](https://mail.rsgc.on.ca/~cdarcy/Datasheets/MSGEQ7.pdf)  □ [SN754410](https://mail.rsgc.on.ca/~cdarcy/Datasheets/sn754410.pdf) H-Bridge  □ [LM3914](https://mail.rsgc.on.ca/~cdarcy/Datasheets/lm3914TI.pdf) Display Driver □ [24LC256](https://mail.rsgc.on.ca/~cdarcy/Datasheets/24LC256.pdf) I2C EEPROM □ [DS1307](https://mail.rsgc.on.ca/~cdarcy/Datasheets/DS1307.pdf) RTC  □ [ATtiny24/44/84](https://mail.rsgc.on.ca/~cdarcy/Datasheets/8006S.pdf)  □ [ATtiny85](https://mail.rsgc.on.ca/~cdarcy/Datasheets/2586S.pdf)  □ [ATmega328p](https://mail.rsgc.on.ca/~cdarcy/Datasheets/ATmega328PSummary.pdf) □ LEDs (single, Bi, RGB)  □ 7-segment display □ Alphanumeric display  □ Bargraph  □ LED Matrix  □ [LCD Panel](https://www.adafruit.com/product/1447)  □ Graphics Panel  □ DC motor  □ servo motor  □ stepper motor  □ solenoid  □ microphone  □ audio line in  □ speaker  □ magnets  □ point-to-point board  □ perma-proto board  □ custom PCB | □ High-Level  □ Assembly  □ Arrays  □ Structs  □ bitwise operators  □ Libraries  □ ADC  □ PWM  □ Debouncing  □ LookUp Table  □ Polling □ Persistence of Vision  □ Interrupts  □ Recursion  □ ISP  □ Onboard EEPROM  □ Processing Language  □ 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  ☑ CAD  □ 3D printing  □ 2D acrylic fabrication  □ EAGLE PCB layout and manufacturing ☑ Word □ Excel ☑ Time-management □ Fritzing  □ Presentation Overview  ☑ video creation  ☑ technical writing  □ OTHER |
| **Communication** |
| □ [(wired) Serial Comm.](http://darcy.rsgc.on.ca/ACES/TEI3M/CommunicationProtocols.html#UART1)  □ [(wired) SPI](http://darcy.rsgc.on.ca/ACES/TEI3M/CommunicationProtocols.html#SPI1)  □ [(wired) I2C (aka. TWI)](http://darcy.rsgc.on.ca/ACES/TEI3M/CommunicationProtocols.html#I2C)  □ [(wireless) RF](http://darcy.rsgc.on.ca/ACES/TEI3M/CommunicationProtocols.html#RF1)  □ [(wireless) IR](http://darcy.rsgc.on.ca/ACES/TEI3M/CommunicationProtocols.html#IR)  □ [(wireless) Bluetooth](http://darcy.rsgc.on.ca/ACES/TEI3M/CommunicationProtocols.html#BT) |
| **Engineering Fields** |
| □ electrical  □ computer  □ mechanical  □ software □ design  □ OTHER |