Table of Contents for Proposals

		Engineering Student Teams		
16	22	Chem-E-Car	$600.00	$ 600.00
17	23	Clean Snowmobile Team	$6,400.00	$2,850.00
18	25	Concrete Toboggan 2010	$3,000.00	$ 1,250.00
19	26	Engineering Orientation	$2,000.00	$ 500.00
20	27	Engineering Society Guest Speaker	$300.00	$ -
21	28	Engineers Without Borders	$580.00	$ 580.00
22	29	Formula SAE	$4,700.00	$ 2,200.00
23	30	IGEM Competition	$1,750.00	$ 900.00
24	32	The Iron Warrior	$1,355.00	$ 450.00
25	33	Midnight Sun	$6,500.00	$ 2,300.00
26	35	North House (Solar Decathlon)	$4,832.00	$ 2,750.80
27	37	STEP - Bike Generator + Solar Cookers	$1,866.50	$ 1,000.00
28	41	University of Waterloo Nanorobotics Group	$6,100.00	$ 1,800.00
29	43	University of Waterloo Robotics Team	$3,809.71	$ 2,000.00
30	44	University of Waterloo Underwater Technology Tea	$5,440.00	$ 1,750.00
31	46	UW Intelligent Robotics Experiments Group	$7,490.52	$ 1,500.00
32	48	UW Micro Aerial Vehicle Team	$2,900.00	$ 2,000.00
33	50	Waterloo Engineering Competition	$510.89	$ 510.89
34	52	Waterloo Space Society	$5,500.00	$ 2,000.00
		Student Teams Total	*$65,634.62*	$ 26,941.69
		Grand Total	*$252,666.20*	$ 85,000.00

Title:

Acm Laboratory Computers

Submitted By:

Name: Brent Carson
E-mail: becarson@uwaterloo.ca
Phone Number: (519)697 7023
Team/Department: Waterloo Architecture Student Association
Position: WEEF Representative

Description of Proposal:

The Imac computers will provide the computing capacity as well as the multi platform accesibility needed for the current needs of architecture students.

Proposal Benefits:

The school of architecture is in dire need of new computers in order to meet the graphic demands for design and photo editing software. The old computers are not even dual core processors, and do not have the sufficient capabilities of running Autocad and other Autodesk programs.
- Increased Graphic Demands
- Faster computers
- Easily Accesible for Mac and Windows platforms

Cost Breakdown:

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
5 Imacs: 2.66Ghz Intel Dual Core	$13,045.00	$13,045.00	$13,045.00	$13,045.00
5 Imacs: 2.66Ghz Intel Dual Core	$13,045.00	$13,045.00	$13,045.00	$0.00
5 Imacs: 2.66Ghz Intel Dual Core	$13,045.00	$13,045.00	$0.00	$0.00
2 Imacs: 2.66Ghz Intel Dual Core	$5,218.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
TOTAL:	$44,353.00	$39,135.00	$26,090.00	$13,045.00

Implementation Schedule:

As soon as proposal funding is confirmed computers will be purchased and ordered for immediate delivery and use.

Additional Information:

None

Contact Information for funding if different than above:

Name: Robert McNair
E-mail: rwmcnair@uwaterloo.ca
Phone Number: (519) 888 456 x27601
Position: Photography and Multimedia

Title:

Rhinoceros 3d Lab Kit

Submitted By:

Name: Brent Carson
E-mail: brent_carson11@hotmail.com
Phone Number: (519) 697 7023
Team/Department: Waterloo Architecture Student Association
Position: WEEF Representative

Description of Proposal:

Rhinoceros is a 3D rendering program that will be used to update the modeling software currently installed on the computers at the School of Architecture.

Proposal Benefits:

The School of Architecture is in need of current software that is used in the workplace. This licence will enable all of the computers to have Rhino installed to be used by the student body for course work and to improve their portfolio work.

Cost Breakdown:

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
Rhinoceros 3D Lab Kit	$975.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
TOTAL:	$ 975.00	$ 0.00	$ 0.00	$ 0.00

Implementation Schedule:

As soon as proposal funding is confirmed, the program will be purchased and ordered for immediate delivery and use.

Additional Information:

None

Contact Information for funding if different than above:

Name: Robert McNair
E-mail: rwmcnair@uwaterloo.ca
Phone Number: (519) 888 456 x27601
Position: Photography and Multimedia

Title:

Chemical Engineering Computer Aided Teaching Room Computer Upgrades

Submitted By:

Name: Dennis Herman
E-mail: dherman@chemengmail.uwaterloo.ca
Phone Number: x32196
Team/Department: Chemical Engineering
Position: Computer Applications Engineer

Description of Proposal:

The Chemical Engineering computer aided teaching room CHEMCAT DWE 1507 is used for undergraduate teaching, tutorials and as a general purpose Nexus workstation room when it is not scheduled for teaching. The equipment in this room is over 7 years old and requires updating. The objective of this proposal is to double the number of student stations from 30 to 60 while increasing the usable desktop space by securing workstations to the underside of tables and replacing existing CRT monitors with LCD monitors equipped with USB ports for data accessibility and portability.

Proposal Benefits:

The CHEMCAT room DWE 1507 currenlty contains 31 P4 Nexus workstations one of which is used as an instructor's workstation. Chemcat is used for a large number of Chemical Engineering courses and labs and serves as a general purpose Nexus workstation room. The major benefit of this proposal is the increased productivity of the students and instructors that use this facility. Increasing the number of student workstations from 30 to 60 improves the number of students who are able to obtain direct hands on experience. In the past classes of over 30 would require doubling up of students per workstation. Increasing the usable desktop space per workstation by replacing CRT monitors with smaller foot print LCD monitors and freeing up desktop space currently consumed by workstation units by securing them to the bottom of the table also improves student productivity. The upgrade from the existing P4 based workstations to Core 2 duo based workstations will improve user response times.

Cost Breakdown:

Insert a simple cost breakdown summary (including partial funding options) here.

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
61 E8400, 2 Gig, 250 Gig HD workstations @$543	$33,123.00	$33,123.00	$0.00	$16,833.00
61 Acer X223WBD LCD monitors @$215	$13,155.00	$0.00	$13,155.00	$6,665.00
1 HP Procurve 2626 switch @$450	$450.00	$450.00	$0.00	$450.00
Taxes	$6074.64	$4,364.49	$1,710.15	$3,113.24
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
TOTAL:	$52,802.64	$37,937.49	$14,865.15	$27,061.24

Implementation Schedule:

Implementaton to begin as soon as components are delivered. Replacement and new systems could be installed one by one without any interruption to regular room usage.

Additional Information:

The department will be responsible for all network cabling upgrades required for this proposal. Option 1 requests funds for all 61 workstations and monitors. Option 2 requests funds for 61 workstations less the m onitors. Option 3 requests funding for 61 monitors. Option 4 requests funds for 31 workstations and monitors.

Contact Information for funding if different than above:

Name: Dennis Herman
E-mail: dherman@chemengmail.uwaterloo.ca
Phone Number: x32196
Position: Computer Applications Engineer

Title:

Software Upgrade For Atomic Absorption Spectrometer

Submitted By:

Name: Jennifer Moll
E-mail: jkmoll@engmail.uwaterloo.ca
Phone Number: x36161
Team/Department: Chemical Engineering
Position: Lab Instructor

Description of Proposal:

This proposal is for an upgrade to the computer, printer and software of an existing Atomic Absorption (AA) Spectrometer that is used in the ChE 2nd year undergraduate lab.

Proposal Benefits:

The AA spectrometer in ChE ungrad lab was purchased in 1990 and operates well but still uses the original Windows 3.1-based software on the 386 computer for which it was licensed. This software is unforgiving when inputs are not entered in a specific order and is limited to performing just one function at a time. It did not seem justifiable to upgrade the system prior to now because service calls are expensive and the existing setup was still functioning. However, the communications interface is now damaged and so it seems a good time to upgrade the control software associated with the interface. The new software has added benefits like capabilities to modify entries after measurement, reprocessing of data, and modification of sample info/order while an analysis is in progress. This AA instrument is used by all chemical engineering students in their 2B term. In addition, it is available for use in 4th year projects that require the analysis of low levels of metals in solution.

Cost Breakdown:

Insert a simple cost breakdown summary (including partial funding options) here.

Item	Option #1	Option #2	Option #3	Option #4
Software Upgrade (WINLAB32 AA) + interface board	$5,000.00	$0.00	$0.00	$0.00
PC Computer + monitor	$1,500.00	$0.00	$0.00	$0.00
Printer	$400.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
TOTAL:	$6,900.00	$ 0.00	$ 0.00	$ 0.00

Implementation Schedule:

Depending on availability of technical rep from AA manufacturer, should be scheduled within the next two months as the instrument is needed for September labs.

Additional Information:

The department of chemical engineering would cover the service fee associated with this installation.

Contact Information for funding if different than above:

Name: Insert Name Here
E-mail: Insert E-Mail Here

Title:

Vernier Data Collection System

Submitted By:

Name: Jennifer Moll
E-mail: jkmoll@engmail.uwaterloo.ca
Phone Number: x36161
Team/Department: Chemical Engineering
Position: Lab Instructor

Description of Proposal:

This proposal is for the purchase of two Vernier handheld datalogger units needed to improve the data collection facilities for first year experiments in the ChE-101 laboratory course.

Proposal Benefits:

The Vernier unit offers automated data acquisition eliminating the need for hand-recording of long series of data over timed intervals. With the graphing function of the unit, students can immediately see the observed data for their temperature-time cooling curves providing them with a visual cue to identify when to stop collecting data. This graphing function also allows for the TA to evaluate the quality of their data and provide feedback during the lab session. All students within the first year of chemical engineering would benefit from this equipment. In addition, the Vernier units could be easily adapted for use in upper year labs such as the 3rd year conductmetric titrations and reaction kinetics experiments by simply purchasing the appropriate probes and attachments.

Cost Breakdown:

Insert a simple cost breakdown summary (including partial funding options) here.

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
2 Vernier LabQuest Units	$1,000.00	$0.00	$0.00	$0.00
2 Thermometer attachments	$120.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
TOTAL:	$1,120.00	$ 0.00	$ 0.00	$ 0.00

Implementation Schedule:

Will purchase immediately.

Additional Information:

Contact Information for funding if different than above:

Name: Insert Name Here
E-mail: Insert E-Mail Here
Phone Number: Insert Phone Number Here
Position: Insert Position Here

Title:

Civil Stapler

Submitted By:

Name: Stuart Pearson
E-mail: stuart.pearson17@gmail.com
Phone Number: 519-504-6052
Team/Department: Civil
Position: Student

Description of Proposal:

Ever since the vandalism of the WEEF-funded Civil Engineering Drop Box stapler three terms ago, the Civil students have had to go stapler-less when dropping off their assignments, which is an enormous inconvenience.

Proposal Benefits:

Civil students will be able to staple their assignments together legitimately resulting in fewer lost/mixed up papers.

Cost Breakdown:

Insert a simple cost breakdown summary (including partial funding options) here.

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
Stapler (from Staples)	$12.99	$12.99	$0.00	$0.00
Chain	$5.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
TOTAL:	$ 17.99	$ 12.99	$ 0.00	$ 0.00

Implementation Schedule:

Stapler would be added to either Civil Computer lab or the drop boxes adjacent to it.

Additional Information:

http://www.staples.ca/ENG/Catalog/cat_sku.asp?CatIds=3%2C4628%2C36,39&webid=711953&affixedcode=WW

Contact Information for funding if different than above:

Name: Insert Name Here
E-mail: Insert E-Mail Here
Phone Number: Insert Phone Number Here
Position: Insert Position Here

Title:

Instrumented Truss Construction System for Teaching Structural Engineering

Submitted By:

Name: Dr. Robert Gracie, Dr. Scott Walbridge, Dr. Wayne Brodland, Dr. Sriram Narasimhan
E-mail: rgracie@cee.uwaterloo.ca, swalbrid@uwaterloo.ca, brodland@uwaterloo.ca, snarasim@uwaterloo.ca
Phone Number: 519-888-4567 x38827, x38066, x36211, x38081
Team/Department: Structures, Mechanics, and Construction Group / Department of Civil and Environmental Engineering
Position: Assistant Professor, Assistant Professor, Professor, Assistant Professor

Description of Proposal:

Design and analysis of trusses is one of the most fundamental and important skills for a civil engineering student to master. A major recurring difficulty that students face is developing confidence that their calculations can accurately describe real structures. To address this challenge we would like to introduce instrumented, desktop-sized model trusses into the classroom so that students can directly compare important quantities such calculated member forces with those present in an actual structure. Students would also be able to construct difference truss designs and compare their relative performance. Because the load-cell display is in real time, it allows influence lines, a particularly knotty and often opaque subject to be illustrated with clarity. It will also make an ideal demonstration tool for recruitment events.

We propose to purchase several *Pasco Structures Systems* consisting of modular plastic components and PC-readable load cells (Fig. 1). A major benefit of the *Pasco Structures Systems* is the ease in which structures can be assembled and real-time measurements taken (Fig. 2). The ease of assembly makes these packages convenient for classroom use. We would like to invest in two bridge truss systems, each complete with six load cells and one amplifier/USB link. These systems will allow students to work in smaller groups within a classroom setting or to compare different truss designs within a single lecture or tutorial session. The sensors will be interfaced to laptops provided by the course instructor or TAs.

Fig. 1. A typical truss, with instrumented members.

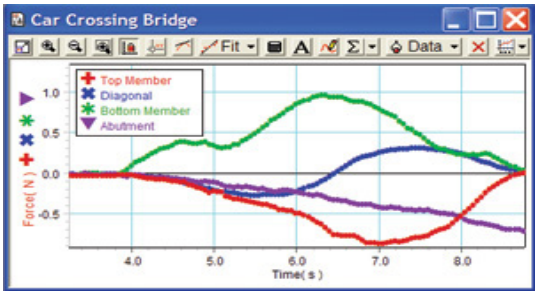

Fig. 2. Real-time display. As the car crosses the bridge the forces measured by each load cell are graphed in real-time in DataStudio®. (Figs taken from Pasco Structural Systems website.)

Proposal Benefits:

Classroom teaching tool. The models will be used repeatedly in the structural analysis courses, including CIVE 127, CIVE 204, CIVE 205. The expected number of students taking CIVE 127 and CIVE 204 in the Fall of 2009 is 126 and 119, respectively. There are currently 88 students in CIVE 205. The models will allow students to verify that their calculations correspond to the forces in real structures, experiment with different structural designs, and learn the physical meaning of influence lines (curves). In addition, they will allow students to obtain hands-on experience with electronic instrumentation.

Fourth year design project. We believe that there will be considerable interest among our fourth year students to use the *Pasco Structures Systems* as part of their mandatory fourth year design project. For example, students who undertake projects in structural health monitoring will be able to use these systems to prototype their designs. Structural health monitoring involves the installation of sensors on structures to monitor their behaviour over their life spans and to issue warnings when the loading of the structure reaches a critical level. We expect that one or two fourth year project groups per year (4 students per group) will use the *Pasco Structures Systems* as part of their projects.

Recruitment. The Department of Civil and Environmental Engineering will derive significant additional benefits from the *Pasco Structures Systems* due to the interest they will generate at recruitment events. We believe that these systems will become a significant feature of any open house (Campus Day, Explorations) or similar event. These systems will attract more students to civil engineering by more clearly demonstrating the types of interesting problems and challenges that exist in this field.

Cost Breakdown:

Below is a cost breakdown for two options: Option #1 includes all of the items required to put together two complete bridge truss systems. Option #2 includes all of the items for a single system only.

Item	*Option #1*	*Option #2*
Bridge Set (ME-6991)	$698.00	$349.00
Load Cell and Amplifier Set (PS-2199)	$1,390.00	$695.00
Additional Load Cells (PS-2200)	$480.00	$240.00
USB Link (PS-2100A)	$168.00	$84.00
DataStudio Single User Licence	-	$170.00
DataStudio Site Licence (CI-6871G)	$629.00	-
P.S.T. + G.S.T.	$437.45	$200.46
TOTAL:	$3,802.45	$1,742.46

Implementation Schedule:

The timely introduction of the *Pasco Structures Systems* into the classroom depends entirely on the release of funding and the delivery of the systems from Pasco Canada. Ideally, we would like to introduce these systems into the Fall 2009 session of CIVE 204 and the Winter 2009 session of CIVE 127.

In addition, we would like to use the *Pasco Structures Systems* during the Fall 2009 high school student recruitment and in fourth year projects starting in the Spring 2010 semester.

Additional Information:

See attached flyer from Pasco Canada and a quote from Pasco for the systems described above.

Contact Information for Funding:

Name: Robert Gracie
E-mail: gracie@cee.uwaterloo.ca
Phone Number: 519-888-4567 X 38827
Position: Assistant Professor

Title: E&CE Laboratory Monitor Upgrade

Submitted Summer 2009 By:

Your Name: Eric Praetzel
E-mail: praetzel@engmail.uwaterloo.ca
Phone Number: ext. 35249
Department: Electrical and Computer Engineering
Position: Laboratory Staff, Hardware Specialist, ECE Nexus Manager

Description of Proposal:

I propose to replace 1998 vintage 17" monitors and 2006 vintage 17" LCDs with 20" wide-screen LCDs in the ECE Public Computer rooms (E2-2360, E2-2362), Fourth Year Projects Lab (E2-3339), Microwave Lab (E2-3342) and Circuits lab (E2-3344, E2-3346).

Proposal Benefits:

This directly benefits courses using the FYDP, Microwave and Circuits labs as well as reducing University power use, and heat generated in the labs.

Cost Breakdown:

20" LCD Monitors: $260 ea

Total – any amount up to $5,400 (20 LCDs), ideally 5 minimum ($1,300)

Implementation Schedule:

August 2009

Additional Information:

The ECE Public computers have 20 CRTs from 2002.

The FYDP lab equipment, 20 stations, is used for the yearly FYDP Symposium. Having LCDs in that room would make them available for the symposiu.

The Microwave lab, 20 stations, uses old 17" CRTs that were being thrown out by Science in 2007.

The Circuits lab, 46 stations, is primarily 2000 vintage 19" CRTs with some 1998 vintage CRTs.

Each such upgrade of a CRT to an LCD would save about $35/year in electricity. The 9 year old 19" CRTs in E2-3344/3346 are starting to have failures in their power saving circuitry and their power draw is then around $80/yr more than a LCD would be.

I look forward to any suggestions ECE Reps have for where to locate these CRTs. My first priority will be to upgrade a few in the FYDP lab (for the Symposium), then the Public computers as they're the most heavily used, then the Circuits lab, lastly the Microwave and FYDP labs. The Robotics lab (CPH-3682) lab currently still uses 17" CRTs from 1998 (>20 stations).

Priority:

Moderate (would be nice – but life can go on without this upgrade)

/home/praetzel/work/weef/s09-2.doc

Title: E&CE Linux Computers to Replace Sun Computers

Submitted Summer 2009 By:

Your Name: Eric Praetzel
E-mail: praetzel@engmail.uwaterloo.ca
Phone Number: ext. 35249
Department: Electrical and Computer Engineering
Position: Laboratory Staff, Hardware Specialist, ECE Nexus manager

Description of Proposal:

I propose to replace the 1998 Sun Ultra 10 360MHz computers with 2.7GHz Linux machines.

Proposal Benefits:

All students using the ECE Unix computers (ECE 327, 328, 428, 437, 438, 439, MTE 241 at least) had access to our two labs (E2-3361, E2-3364) with Sun Ultra 10 computers with 21" CRTs. Many students access our high power Linux servers (thanks to WEEF W09!) from Nexus computers – but, for graphical tasks, it's faster to use a Linux computer directly.

Cost Breakdown:

2.7GHz dual-core AMD computer with 2G RAM: $460
Total – any amount up to $4,600 (10 computers)
Implementation Schedule: May 2009

Additional Information:

The Sun Ultra 10 computers were 360 MHz with 512M of RAM and were surplussed in Summer 2009.
There were 24 Sun computers installed in the labs.
Some research is being done into how best to use the two Unix rooms, how many computers should be made available, etc.

The 1998 Sun 21" monitors work well with the Linux computers and will be re-used. They work upto a resolution of 2048 x 1536 although they are power hungry and generate a fair bit of heat.

Currently there are five Pentium III computers, for ECE 493, and two borrowed P4's in E2-3361.
The E2-3361 lab was specially chosen as it has a chiller that can cool the room any time of year. It is the only such ECE laboratory.

The ECE Unix computer rooms are for Unix use and do not have scheduled labs - as all of our Nexus labs do.P

Some department funding will likely be available but details are unavailable at this time..

Priority:

Moderate (would be nice – but life can go on without this) **/home/praetzel/work/weef/s09-1.doc**

Title: E&CE Nexus Computer Upgrade

Submitted Winter 2009 By:

Your Name: Eric Praetzel
E-mail: praetzel@engmail.uwaterloo.ca
Phone Number: ext. 35249
Department: Electrical and Computer Engineering
Position: Laboratory Staff, Hardware Specialist, ECE Nexus manager

Description of Proposal:

I propose to replace 4 year old Pentium IV, computers (E2-3339 - Fourth Year Design Projects lab and E2-3342 Microwave lab, CPH-3682 "robots" lab) with new AMD computers to address performance and comfort issues.

Proposal Benefits:

Upgraded computers would directly benefit all ECE students as these rooms are used by core courses.. Software will run 2x faster and the computers use about 75% less electricity. The new computers will be capable of running Windows Vista when that upgrade is required.

Computer systems are responsible for 1/3 of the total heat generated within an ECE laboratory and so replacing Pentium IV's is an easy way to reduce room heating and electricity use - saving the university money.

Cost Breakdown:

2.7GHz single-core AMD Computers with 2G RAM: $440 ea (taxes included)
Total – any amount up to $8,800 (20 computer systems), ideally $2200 minimum

Implementation Schedule:

August 2009

Additional Information:

The Pentium 4 computers would move into the E2-3347 (used by ECE 231, 332, 43x) replacing Peniutm I 333 MHz computers running Windows 98.

Currently the E2-3339 lab is a mixture of Pentium III, IV and new AMD computers and it is the last ECE Lab with Pentium III computers in it. It would be nice to sell all of the P3 computers retired.

I expect that some funding, of the special $400k lab upgrade, will become available for this upgrade; but nothing has been finalized yet.

All three labs have approx 60 P3 and P4 computer in them, so upgrading 20 is a good start.

As always I'm open to feedback as to which machines to upgrade first. My goals are to retire the P3's, then start upgrading the old P4s in the controls lab (they were donated by Home Hardware and their motherboards have a high failure rate) and then upgrade the Microwave lab.

Priority:

Moderate (would be nice – but life can go on without this)

/home/praetzel/work/weef/s08-1.doc

Title:

Laboratory Specimens For Use By Geological Engineering (And Earth Students) In Earth 231

Submitted By:

Name: Katherine L. La Hay
E-mail: klahay@sciborg.uwaterloo.ca
Phone Number: Extension 36957
Team/Department: Earth Science
Position: Demonstrator

Description of Proposal:

Old mineral and rock specimens used in Earth 231 by both Geological Engineering and Earth Science students need to be replaced. The present specimens are well used and getting too small to be useful.

Proposal Benefits:

Better specimens will make it ever so easy for the students to correctly identify the mineral and rock specimens in the laboratory.

Cost Breakdown:

Insert a simple cost breakdown summary (including partial funding options) here.

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
181 Rock Specimens @ $10.00	$1,810.00	$900.00	$450.00	$0.00
480 Mineral Specimens @ $15.00	$7,200.00	$3,600.00	$1,800.00	$1,800.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
TOTAL:	$9,010.00	$4,500.00	$2,250.00	$1,800.00

Implementation Schedule:

Depending upon the timing the specimens could be ordered, labelled and ready for the fall term.

Additional Information:

Shipping is extra. If possible I order specimens from a dealer in Kingston who takes them to a rock and mineral show in Sudbury where a member of the Earth Department is working. That person then brings the specimens back here - no shipping! A list is attached.

Contact Information for funding if different than above:

Name:
E-mail:
Phone Number:
Position:

Title:

Dale Carnegie Course For Management Engineers

Submitted By:

Name: Matthew Guilherme
E-mail: matthew.guilherme@gmail.com
Phone Number: 519-635-8532
Team/Department: 2B Management Engineering
Position: Student

Description of Proposal:

Management Engineering is a discipline often mocked by other Engineers due to the "softness" of the skills learned in the program. However, an internationally-recognized management and leadership course would provide a unique opportunity for a group of Engineers to experience. The Dale Carnegie course provides leadership and management tools and techniques that make students into better leaders and better managers. The full Dale Carnegie course costs $1700 per person, however, upon discussions with the Ontario Representative, two options were provided. These two options take several of the modules from the Dale Carnegie course and are shown below. This proposal is for the first group of Management Engineers (~30-40) to take the course.

Proposal Benefits:

- Because it is only the 3rd year it is being offered, the Management Engineering program has yet to become a staple in the Engineering world at UW. This course will add great creedance to the Management Engineering program.
- Having a modified Dale Carnegie Course on a student's resume will give them a great advantage not only when searching for co-op jobs, but also when they go out into the workforce
- UW prides itself in having "well rounded" students who go through the PDEng program. This goes several steps above and beyond what is learned in PDEng
- The Dale Carnegie Course is an internationally recognized management and leadership course with over 8 million graduates of the program.
- This introduction of the Dale Carnegie course can grow into a relationship between UW and the Dale Carnegie program, allowing for future students of various disciplines to partake in the program

Cost Breakdown:

Insert a simple cost breakdown summary (including partial funding options) here.

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
2 Full Days or 4 Half Days (3 hours each)	$9,995.00	$0.00	$0.00	$0.00
3 Full Days or 6 Half Days (3 hours each)	$0.00	$14,995.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
TOTAL:	$9,995.00	$14,995.00	$ 0.00	$ 0.00

Implementation Schedule:

Upon discussions with the contact at the Dale Carnegie Program, this Proposal can be implemented any time. Thus, it would be implemented in the first 30 days of the Winter 2010 semester (when all 3A Management Engineers will next have an academic term)

Additional Information:

Below is a breakdown of the topics that would be included in the two different options:
The 2 day curriculum would consist of the following: Creating Business Connections; How To Gain Will Co-operation; Change Management; Presentations; Selling Ideas; Managing Business Stress and Worry.

The 3 day curriculum would include all of the above modules, plus: Developing Flexibility; Inspiring Others; Coaching.

Several references from various Engineering Firms are available, including one from Stantec Consulting (Engineering Consultation in Waterloo) on how the Dale Carnegie program "helped grow their people and maximized their business returns."

The full document from the Dale Carnegie representative is available upon request

Contact Information for funding if different than above:

Name: Insert Name Here
E-mail: Insert E-Mail Here
Phone Number: Insert Phone Number Here
Position: Insert Position Here

Title:

Rankine Power Cycle Teaching Laboratory

Submitted By:

Name: Kyle Daun
E-mail: kjdaun@mme.uwaterloo.ca
Phone Number: x37871
Team/Department: Mechanical and Mechatronics
Position: Assistant Professor

Description of Proposal:

The thermodynamics teaching laboratory in ME 354 (Thermo. II) helps students visualise abstract concepts taught in the classroom, including phase change and the 1st and 2nd laws. It also teaches studends how to record and analyse experimental data, which are critical skills in both research and industry. The current vapor-refrigeration apparatus has been in use for over 30 years, however, and its mechanical failure is immiment. We would like to replace this laboratory with a new Rankine cycle. Steam generated by a gas-fired boiler is used to run a steam turbine, which is connected to a DC generator. Students make temperature and pressure mesurements directly, and can also monitor the system electroncally through a USB interface.

Proposal Benefits:

The thermofluids teaching lab is a core component of the mechanical engineering undergraduate curriculum, and will also be incorporated into the mechatronics thermofluid program, thereby directly benefiting approximately 300 students per year. Although we could replace the current apparatus with another refrigeration system, the Rankine cycle is a more dynamic and engaging learning experience. It also provides students with a critical understanding of the growing environmental and economic consequences of thermoelectric power generation.

Cost Breakdown:

Insert a simple cost breakdown summary (including partial funding options) here.

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
Rankine Power Cycle	$29,411.00	$0.00	$0.00	$0.00
Vapor Refrigeration Cycle (replacement)	$0.00	$24,863.39	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
DENSO Foundation Grant	($15,000.00)	($15,000.00)	$0.00	$0.00
MME Department Funding	($5,000.00)	($5,000.00)	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
TOTAL:	$9,411.00	$4,863.39	$ 0.00	$ 0.00

Implementation Schedule:

The new teaching lab equipment will be purchased and installed in Fall 2009, and will be incorporated into the Winter 2010 offering of ME354. The experiment will also be part of the new mechatronics thermofluiods curriculum, to be offered in the following year.

Additional Information:

WEEF funding will be matched dollar-for-dollar by the MME department. WEEF and departmental funding will supplement a $15,000 grant from the DENSO Foundation. Please see attached information sheets for details on the cycles.

Title:

Robotics Platform For Me 595: Autonomous Mobile Robotics

Submitted By:

Name: Steven Waslander
E-mail: stevenw@uwaterloo.ca
Phone Number: (519) 888-4567 x32205
Team/Department: Mechanical and Mechatronics Engineering
Position: Assistant Professor

Description of Proposal:

This proposal seeks funding for three outdoor mobile robotic platforms as part of a new fourth year technical elective on Autonomous Mobile Robotics. The focus of the course will be on the development of algorithms for autonomous operation of mobile platforms, instead of on developing the hardware for the platform from scratch. To this end, a robust, reliable and easily maintained platform is needed. Example projects for the course include: autonomous offroad navigation, robot racing, IED detection, automated driving, cooperative search and rescue, fire detection and elimination, etc. The course will be offered for the first time this fall, and will use hardware developed by students as part of a related graduate level course.

Proposal Benefits:

This is the only course focused on mobile robotics offered to fourth year undergraduate students, and fits particularly well with the curriculum in MME, ECE and SYDE. Despite the lack of dedicated courses, 25 of the 85 4th year Mechatronics students chose to build mobile robots for their 4th year project, a clear indication of the interest in this topic. Also indicative of students' interest is the presence of the many related student teams (UWNRG, UWRT, UWMAV, WARG).
The current platforms were developed by students enrolled in a similar graduate-level course. However, undergraduate students do not have the time to develop their own robot platforms alongside their 4th year projects and other course obligations. This funding will allow us to provide a reliable platform for the class, allowing students to focus on algorithm development for autonomous operation (the course content), instead of electronics troubleshooting or mechanical design.

Cost Breakdown:

The platform will be based off of an existing design created by UWRT for entry in the IGVC competition (also funded by WEEF), but will be a scaled down version that is smaller and less expensive. The preferred option is for three new vehicles, which will be sufficient for a class of 30 students (2 teams of 5 per vehicle). The next two options are for 2 and 1 vehicles, respectively with reduced class sizes. Aside from the costs of the new platforms, we are requesting a small amount of funding to repair the current vehicles to a workable, reliable state for the first offering, allowing us run the course in the coming term and incorporate feedback from the students into the new design. Shipping & handling, and brokerage fees do not change.

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
Sensors (computer, webcam, GPS, sonar)	$3,030.00	$2,020.00	$1,010.00	$0.00
Electrical system	$2,445.00	$1,630.00	$815.00	$0.00
Mechanical parts	$2,385.00	$1,590.00	$795.00	$0.00
Shipping, handling, brokerage	$300.00	$300.00	$300.00	$0.00
Hardware for repair	$515.00	$515.00	$515.00	$0.00
	$0.00	$0.00	$0.00	$0.00
TOTAL:	$8,675.00	$6,055.00	$3,435.00	$ 0.00

Implementation Schedule:

The platforms will be developed and tested by the end of the fall semester, 2009 and will be used in the following offering (currently anticipated as Fall, 2010)

Aug 2009: Finalize design for course use - 2-4 weeks
Sept 2009: Purchase all components - 2 weeks
Sept-Oct 2009: Construction of initial vehicle - 1 month
Oct 2009: Low level software development - 2 weeks
Nov 2009: Testing of initial vehicle - 1 week
Nov-Dec 2009: Lockdown of final design and buildout - 1 month

Additional Information:

The robots will be designed and developed for free by two of Waterloo's own, Ryan Gariepy and Patrick Martinson, who have years of experience in building these vehicles. Based on their existing successful designs, the robots will be tailor made to contain the right sensors and computation platforms to make learning easy. This custom approach significantly reduces cost.

Contact Information for funding if different than above:

Name: Insert Name Here
E-mail: Insert E-Mail Here
Phone Number: Insert Phone Number Here
Position: Insert Position Here

Title:

Bench Equipment For Syde Teaching Lab

Submitted By:

Name: Tariq Naqvi
E-mail: tnaqvi@engmail.uwaterloo.ca
Phone Number: Ext.35218
Team/Department: Systems Design Engineering
Position: Lab Instructor - Submitted June 08 2009

Description of Proposal:

The Systems Teaching Lab is mainly used for 3 core undergraduate courses. We currently need to upgrade our Teaching Lab equipment such as function generators, oscilloscopes and multimeters. Since this is a major and costly upgrade we are seeking funding from WEEF to upgrade the equipment 2 stations at a time. This is a continuation of a previous proposal, accepted by WEEF, for the same equipment. In the past, WEEF has funded the Systems Teaching Lab to purchase 4 stations and we are asking WEEF to fund 2 more stations this term and the rest in subsequent terms.

Proposal Benefits:

This proposal will help our Circuits course students and would help them to finish their hands-on labs without spending more time troubleshooting the older equipment. The old equipment coming out of the Teaching Lab will be used in our workshop lab to support design workshop projects.

Cost Breakdown:

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
Rigol 100 MHz Digital Oscilloscope	$0.00	$0.00	$0.00	$0.00
Rigol 20MHz Waveform Generator	$0.00	$0.00	$0.00	$0.00
Rigol Digital Multimeter	$0.00	$0.00	$0.00	$0.00
Total Package Cost	$4097.50	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
TOTAL:	$4,097.50	$ 0.00	$ 0.00	$ 0.00

Implementation Schedule:

Immediate

Additional Information:

Contact Information for funding if different than above:

Name:
E-mail:
Phone Number:
Position:

Title:

Chem-E-Car Weef Proposal

Submitted By:

Name: Forogh Askari
E-mail: faskari@engmail.uwaterloo.ca
Phone Number: 519 501 8177
Team/Department: Chem-E-Car
Position: Team Member

Description of Proposal:

The UW Chem-E-Car team consists of mainly chemical engineering undergraduate students. The purpose of the Chem-E-Car team is to compete at the 2009 Chem-E-Car competition in Montreal (International World Congress of Chemical Engineering). Team members design and construct a chemically powered vehicle within certain size constraints.This vehicle must be designed to also carry a specified cargo. The teams will be told at the time of the competition the distance that the car must travel and the specified cargo that the vehicle will carry. We have previously submitted a WEEF proposal (Fall 2008) and have used the money wisely.

Proposal Benefits:

Chemicals used for the competition can be used in undergraduate laboratories. Fuel Cell compartments can be used in the Fuel Cell lab. This gives undergraduate students experience in engineering design and prototyping, and helps them learn about alternative/novel forms of enery.

Cost Breakdown:

Insert a simple cost breakdown summary (including partial funding options) here.

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
Sodium boroxide, aluminum borohydride, catalyst	$100.00			
Building materials (plexi glass, metal box, etc)	$200.00			
GDL: 20cm x 20cm sheet carbon paper | $60 ea x 5	$300.00			
Nafion: 30cm x 30cm sheet | $240 ea x 2 sheets	$480.00			
TOTAL:	$1,080.00	$ 0.00	$ 0.00	$ 0.00

Implementation Schedule:

Fall 2008 - design (done), Winter 2009 - reactions/design (done), Spring 2009 - build, test trials, competition in August

Additional Information:

Funding might be needed if students continue with the team annually.

Contact Information for funding if different than above:

Name: Insert Name Here
E-mail: Insert E-Mail Here

Title:

Fall 2009 Clean Snowmobile Team - Engine, Turbocharger, And Ecu

Submitted By:

Name: Andrew Chin and Jason Wong
E-mail: a2chin@engmail.uwaterloo.ca
Phone Number: 647 295 0779
Team/Department: UW Clean Snowmobile Team
Position: Student Members

Description of Proposal:

The UW Clean Snowmobile Team is working towards building a new snowmobile for the 2011 SAE Clean Snowmobile Competition (CSC). The objective of the competition is to reduce the environmental impact of a stock snowmobile while maintaining high performance. The competition is broken down into several categories, with a strong emphasis on performance (approx. 50% of total points). To remain competitve, the UW Snowmobile team requires a new engine (Yahama Gensis80), turbocharger (Garret GT2056), and accompanying ECU (DTA Fast S80). The purpose of this proposal is to request funding for the purchasing of these items.

Proposal Benefits:

By participating on the Clean Snowmobile team, engineering undergraduate students at the University of Waterloo learn valuable hands on skills and exposure to real life engineering applications. There are currently 17 student members on the team. The CS Team participates in many events (UW Energy Days, KW Santa Clause Parade, SAE CSC) that help to improve the image of engineering at the University of Waterloo. Funding for these components will be valuable for the UW CSC team to ensure a high place finish at the competition. The team wishes to purchase a new Yahama Genesis 80 engine, which is lightweight/powerful and will be the new backbone of the snowmobile. For added performance, the team once again wants to incorporate a Garret GT2056 Turbocharger to improve the snowmobile's power to weight ratio. A new DTA Fast S80 ECU will serve as the "brain" of this new engine setup, allowing for easier tunning and tweaking of the fuel maps in addition to many other useful features

Cost Breakdown:

We are requesting funding or the following items from WEEF:

1. Engine - Yamaha Genesis 80: This engine is from the Yamaha Phazer and will be purchased used as the chassis is not required

2. Turbocharger - Garret GT2056: This unit will be purchased new from a supplier

3. ECU - DTA Fast S80: This item will be purchased new from a supplier

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
1. Engine	$4,000.00	$4,000.00	$0.00	$0.00
2. Turbo Charger	$700.00	$700.00	$0.00	$0.00
3. ECU	$1,700.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
TOTAL:	$6,400.00	$4,700.00	$ 0.00	$ 0.00

Implementation Schedule:

The desired items have been selected and priced accordingly. Purchase of these items will occur shortly after funding is approved by WEEF. Local junkyards and suppliers have already been contacted.

Additional Information:

We are prepared to offer WEEF sponsorship benefits equal to those offered to external sponsors. This would include displaying the WEEF logo on the snowmobile, any equipment they provide funding for, and at any events the team participates in.

Contact Information for funding if different than above:

Name: Insert Name Here
E-mail: Insert E-Mail Here
Phone Number: Insert Phone Number Here
Position: Insert Position Here

Title:

Great Northern Concrete Toboggan Race 2010

Submitted By:

Name: James O'Leary
E-mail: joleary@uwaterloo.ca
Phone Number: 519-575-3010
Team/Department: GNCTR 2010
Position: Sponsorship Director

Description of Proposal:

The team will travel to Hamilton in February 2010 to compete in the Great Northern Concrete Toboggan Race against other schools across Ontario. We need help funding the building of our toboggan, including concrete, formwork and reinforcement.

Proposal Benefits:

There are approximately 25 students on the team from the 2010 Civil Engineering class, we are looking to add students from the 2012 class to carry the tradition of this team and students from the mechanical class to help with the braking and steering systems.

Cost Breakdown:

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Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
Concrete (admixtures, aggregate, wire fabric)	$1,250.00	$0.00	$0.00	$0.00
Frame (Steel tube,welding materials)	$500.00	$0.00	$0.00	$0.00
Pneumatic Cylinder	$250.00	$0.00	$0.00	$0.00
Steel Plate	$300.00	$0.00	$0.00	$0.00
Hinges	$200.00	$0.00	$0.00	$0.00
Travel	$500.00	$0.00	$0.00	$0.00
TOTAL:	$3,000.00	$ 0.00	$ 0.00	$ 0.00

Implementation Schedule:

The sled will be buit in the Spring 2009 term and will be raced in February 2010

Additional Information:

Based on our sponsorship package this will be great publicity for WEEF, including a logo on our website, a logo on our technical display, logo on uniform, a thank you plaque and a logo on our toboggan.

Contact Information for funding if different than above:

Name: Same as above
E-mail: Same as above
Phone Number: Same as above
Position: Same as above

Title:

Engineering Orientation

Submitted By:

Name: Matt Hunt
E-mail: matt.hunt247@gmail.com
Phone Number: 519-274-4123
Team/Department: Engineering Orientation
Position: Engineering Federation Orientation Committee (FOC)

Description of Proposal:

Engineering Orientation is requesting funding for equipment and materials for events during the week. These items would include items such as safety equipment for our leaders to wear (safety glasses, gloves), tools and hardware (hammers, saws, screws), and potentially power tools (combination sets that include saws, drills, etc).

Proposal Benefits:

Engineering Orientation is a time that new students are introduced to the University of Waterloo. The new students are transitioned into their role as young adults with the guidance of returning upper year students. This is also a time when the incoming students get to discover their new home, the city of Waterloo, and the opportunities it has to offer them. This is an extremely memorable and exciting time for first years.
At the University of Waterloo we have 1400 up and coming engineering students, the total student population on campus is 25000. This is a great occasion to expose WEEF to all of these new and returning students.

Cost Breakdown:

As we will be purchasing these equipment and items to help run Orientation Week, we are requesting $2000.00, any amount received will go directly to these as requiered (ex. a power drill for making the waterslide, work gloves, safety glasses, etc).

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
Tools & Equipment	$2,000.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
TOTAL:	$2,000.00	$ 0.00	$ 0.00	$ 0.00

Implementation Schedule:

These items would be purchased during August through to September during Orientation week when we requiere these supplies to run our events.

Additional Information:

WEEF will also be integrated into the week similar to previous years, with the WEEF logo on frosh t-shirts, WEEF stickers in frosh kits, verbal recognition, etc.

Contact Information for funding if different than above:

Name: Insert Name Here

Title:

Engsineering Society Motivational Speaker Fee Proposal

Submitted By:

Name: David Liu
E-mail: s14liu@engmail.uwaterloo.ca
Phone Number: 519-888-4567 ext. 29902
Team/Department: Engineering Society
Position: VP Education

Description of Proposal:

The Engineering Society is iniviting motivational speaker, Andy Thibodeau - an impact presenter, to speak to all UW engineering students. For details about Andy, refer to section below.
This proposal asks for $200 to partially cover the $500 speaker fee and $50 transportation fee. Engineering Society will cover food and drinks that will be provided during the talk.

Proposal Benefits:

In engineering faculty, undergraduate students have many opportunities to here tech talks. However, this is something different. Engsoc is iniviting a professional inspirational speaker to empower students from a different perspective. It will open students' eyes to new ideas and challenge students go above and beyond their limit.

Cost Breakdown:

Insert a simple cost breakdown summary (including partial funding options) here.

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
Guest Speaker Fee (Andy Thibodeau)	$300.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
TOTAL:	$ 300.00	$ 0.00	$ 0.00	$ 0.00

Implementation Schedule:

The guest speech will be on Thursday, July 2nd at 5pm in RCH-302

Additional Information:

Andy's personal information:
I have been professional speaking since 1992, visiting over 2000 schools and conferences in 10 provinces and 38 states. This includes my 400+ appearances at 20 universities & colleges, such as Western, Queens, Brock, Waterloo, Guelph, McMaster, Laurier, Nipissing, St. Lawrence, Fanshawe, Humber, Sheridan, Centennial, Canadore, Fleming, and Niagara College in 2003 – 2008.

At universities and colleges, my presentations have been used in the following settings: Orientation leaders training; Orientation Week entertainment; students' council/residence Council training and motivation; residence staff programs; a special evening for a faculty or residence; awards banquets; a "thank you" program for campus volunteers

Title:

Engineers Without Borders: Request For Canvas Display Board

Submitted By:

Name: Emma Jing
E-mail: emmaxjing@gmail.com
Phone Number: 226 338 8127
Team/Department: Engineers Without Borders
Position: Member of EWB Fundraising Committtee

Description of Proposal:

EWB is requesting a canvas display board for the 2009 Spring term. We have spoken with WPIRG, who purchased one in 2005 for $514 plus taxes from Hahn Holdings Ltd. in Waterloo. The benefits of a canvas board should outweigh the regular cardboard option in the long run. This canvas can last decades and will be both a sound economic and environmental option.

Proposal Benefits:

-One main goal of EWB is outreach and education. With the canvas display board, EWB will be better equipped to share information with the community, especially when boothing, as EWB often does. This will result in many engineering students gaining valuable presentation skills that they would have not otherwise gained.
-EWB makes many funding requests, presenting both to companies and faculty. A more professional display can have a significant impact on the effectiveness of the message and the resulting contribution. The contribution allows for EWB to carry on campus activities for engineering students and also allows us to send student volunteers overseas.
-Having a reusable canvas board is more environmentally friendly, especially considering an organization such as EWB, who currently uses cardboard alternatives regularly.

Cost Breakdown:

Insert a simple cost breakdown summary (including partial funding options) here.

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
Canvas Display Board ($514+taxes)	$580.00	$435.00	$290.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
TOTAL:	$ 580.00	$ 435.00	$ 290.00	$ 0.00

Implementation Schedule:

EWB would appreciate receiving the funding by early August so as to allocate one month to the purchase and preperation for the display. Since Fall term has the highest amount of students on campus, it would be vital to have enough visibility during the first week where first year and returning students are seeking involvement opportunities.

Additional Information:

We are also seeking other types of funding from EngSoc. During Fall and Winter terms, we apply for funding from Arts. Keeping in mind, a considerable percentage of our memebership this term does stem from Engineering, we feel is is appropriate to request this display board to WEEF.

Title:

Formula SAE Spring 2009 WEEF Proposal

Submitted By:

Name: Adam Howard
E-mail: uwfsae@gmail.com
Phone Number: x35904
Team/Department: Formula SAE / Mechanical Eng
Position: Chassis Designer

Description of Proposal:

We would like to request four (4) main items. First is a new Engine Control Unit (ECU). We need a new ECU for the 2010 car, and have selected an ECU which is almost half as expensive as our previous units ($1200 vs $2500). Secondly, we need a new spare engine, as we have switched from the discontinued Honda F4i engine to the CBR 600RR engine. This spare will be potentially used for the next five (5) years, unless it is needed if an engine breaks catastrophically. Third, we need a new set of rebuildable Penske Dampers, as our current sets are in use on the 2007 and 2009 car. Lastly, we need a new team laptop. Our current laptop is approximately five (5) years old, and no longer works. It is used for tuning the engine, and for race analysis.

Proposal Benefits:

Support for Formula SAE provides an excellent public/corporate awareness tool for WEEF. UW FSAE is a consistent Top 10 finishing team, competing with 140 other teams from around the world. Our competition is sponsored by 'The Big Three' (Daimler-Chrysler, Ford, GM) and attracts numerous engineering and technology companies. Furthermore the FSAE team and its supporters like WEEF receive exposure at numerous events such as the Toronto Int'l Auto Show, Molson Indy, SAE World Congress, as well as numerous community events (Oktoberfest Parade, Santa Claus Parade, Canada Day Celebrations). The team also actively presents the car to UW students during Frosh week, Student Life 101, Alumni celebrations and by test-driving at various parking lots around campus.

Cost Breakdown:

Insert a simple cost breakdown summary (including partial funding options) here.

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
Engine Control Unit (ECU)	$1,200.00	$1,200.00	$0.00	$1,200.00
Spare CBR 600RR Engine	$1,500.00	$1,000.00	$1,000.00	$0.00
Penske Dampers	$1,000.00	$0.00	$1,000.00	$1,000.00
Laptop	$1,000.00	$800.00	$800.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
TOTAL:	$4,700.00	$3,000.00	$2,800.00	$2,200.00

Implementation Schedule:

All items purchased would be used immediately, with exception of the spare engine, which would not be used until Winter term.

Additional Information:

Insert any additional information here.

Title:

The 2009 International Genetically Engineered Machine (Igem) Competition

Submitted By:

Name: Hillary Yeung, Wylee Co
E-mail: hillaryyeung@gmail.com, uwigem@gmail.com
Phone Number: extension 32320
Team/Department: UW iGEM Team
Position: Team members

Description of Proposal:

The International Genetically Engineered Machine (iGEM) competition, hosted by the Massachusetts Institute of Technology (MIT), is an annual event that involves designing and building biological devices. These devices are engineered by combining biological "circuit elements", analogous to electrical components (e.g. resistors, capacitors). At the 2008 competition, Waterloo's team presented an ambitious genome-free bacterial control system for the transient expression of useful bioproducts. As a student-run team, the acquisition of funds to establish captial is a daunting task. As our team has grown our need for more lab equipment has increased. We hope to invest in a set of micropipettes as well as vortex.

Proposal Benefits:

For students, iGEM is an excellent opportunity to learn and apply their design and lab skills in a research setting. It provides a unique research oppertunity at the undergraduate level and allows team members to work on a truly interdisciplinary project. In addition, at the competition, students can share and discuss their project with professionals from many different fields. For the University, iGEM showcases the UW team on an international level, where researchers, industrial representatives and media will be present. iGEM presenets UW a chance to be an important contributor to the new and expanding interdisciplinary field of synthetic biology. The ability to complete our project relies on key equipment for lab use such as micropipettes.

Cost Breakdown:

Insert a simple cost breakdown summary (including partial funding options) here.

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
Lab equipment - set of 4 Pipetman micropipettes	$1,300.00	$1,300.00	$600.00	$0.00
lab equipement - vortex	$450.00	$0.00	$300.00	$450.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
TOTAL:	$1,750.00	$1,300.00	$ 900.00	$ 450.00

Implementation Schedule:

Access to laboratory space has been secured, and the 2009 project has been designed. Lab work has already started. The bulk of the lab work (implementation and testing) would idealy to be done by the end of the summer. The purchase of a set of pipettes and vortex would improve team productivity and project progress dramatically.

Additional Information:

Micropipettes are the basic tool for any molecular work and are used continously. With the team's growth, it is now necessary to purchase an additional set.

The UW iGEM team is requesting $1750 from WEEF for S09, but will accept any amount of funding for the items requested in this proposal. The remaining 2009 budget will be sought from MEF, ENGSoc, FSF, WATSEF, UW faculties/departments, and corporations (half of the budget has already been secured from a number of these sources). WEEF has supported the UW iGEM Team for the last two years, and your continued support is greatly appreciated.

WEEF's support will be recognized by a sticker on the unit and by the ways listed in the Sponsors table at http://igem.uwaterloo.ca/Sponsorship

Contact Information for funding if different than above:

Name: John Heil, Shira Davis
E-mail: uwigem@gmail.com
Phone Number: extension 32320
Position: UW iGEM Team Leaders

Title:

Production Software Upgrade For The Iron Warrior

Submitted By:

Name: Michelle Croal
E-mail: iwarrior@engmail
Phone Number: 519-888-4567 x32693
Team/Department: The Iron Warrior
Position: Editor-in-Chief

Description of Proposal:

Software upgrade to Adobe Creative Suite 4 (Design Premium) from CS2. This design suite contains Indesign, used for publication layout, and Photoshop among other tools such as Illustrator and Dreamweaver. Some options may not be used as frequently, and as such the proposal includes options to upgrade only the key programs (Indesign, Photoshop). Costs shown are for two items (i.e 2 computers in IW office).

Proposal Benefits:

Benefits include: additional features for design, layout and virtual workspace will improve IW productivity. Provides a direct benefit to Iron Warrior staff (editors and layout staff), by reducing production time. Follows with technology advances in the media and publication industry. Purchasing this software prevents problems with illegal copies and copyright laws. Indirect benefits to UW Eng include potential for a more awesome newspaper!

Cost Breakdown:

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
Upgrade to Adobe Creative Suite 4 Design Premium	$1,355.00		$0.00	$0.00
Upgrade Indesign and Photoshop to CS4	$0.00	$900.00	$0.00	$0.00
Upgrade Indesign only	$0.00	$0.00	$450.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
TOTAL:	$1,355.00	$ 900.00	$ 450.00	$ 0.00

Implementation Schedule:

Purchase software from Adobe, download and install (1 day).

Additional Information:

The quotation for upgrade to Creative Suite 4 is based on an educational discount for the "full" suite. Based on what IW already has (various programs, but not a full previous suite), the non-educational "upgrade" is $1399 each (i.e. US$2798 total).
These estimates have been converted to CAD from USD and do not include taxes (N/A). Original USD figures: option 1: $1198, option 2: $796, option #3 $398.

Title:

Midnight Sun: Mold Building Supplies, Solar Cells, Mppt's, And Radio Set

Submitted By:

Name: Howie Lau
E-mail: h3lau@engmail.uwaterloo.ca
Phone Number: 519-616-4798
Team/Department: Midnight Sun Solar Race Car Team
Position: Project Manager

Description of Proposal:

The Midnight Sun Solar Race Car Team is the largest student-run project at the University of Waterloo. Formed in 1988, students from a variety of different faculties and departments actively participate in the design, construction and racing of a solar car in each two-year cycle to compete in the North American Solar Challenge and World Solar Challenge. The team also aims to educate the public on the applications of alternative energy and the importance of preserving the environment.

Proposal Benefits:

The majority of our participating team members are engineering undergraduate students from various departments with approximately 20 core members and an additional 80 participating students. The team provides it's members with projects that give them the oppurtunity to design and innovate in areas such as areobody design, composite manufactuing, PCB design and layout, embedded development as well as mechanical desgin. Team members also gain insight into areas not typically experienced in classroom settings. Through race participation, members gain leadership skills, and adapt to high-stress environments while learning to efficiently work in a team environment. Students gain exposure to the business world via direct industry contacts for sponsorships and technical support, as well as an understanding of standard practices outside of academia.

Cost Breakdown:

The most pressing item needed for funding is fibreboard to build the mold for our latest car's aerobody for September. Further resources are also required for silicon cells and their encapsulation. Our maximum power point trackers, used to drive solar cells at their correct voltage, have been sporadically malfunctioning at race events; funds are requested to purchase new units. Our team has also suffered from issues surrounding our current radio set where transmission quality between two radios fluctuates dramatically over a short distance. We are looking to make a long-term investment by purchasing a short-track radio set that will resolve transmission problems and can be used within the team and can be lent to other student teams.

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
Mold Building Supplies	$700.00	$700.00	$700.00	$700.00
SunPower A300 Silicon Cells (Partial)	$3,800.00	$3,800.00	$3,850.00	$2,300.00
Maximum Power Point Trackers	$1,000.00	$1,000.00	$0.00	$0.00
Short-track Radio Set	$1,000.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
TOTAL:	$6,500.00	$5,500.00	$4,550.00	$3,000.00

Implementation Schedule:

Funds allocated towards mold building supplies will be used immediately, as shaping fibreboard into a mold is a lengthy process. Solar cells will be ordered approximately one month prior to the casting of the mold, and encapsulation of the cells will occur on their arrival. MPPT's will be ordered immediately to allow time

for build and shipment as they are a special order item. The short-track radio set will be ordered within the year for driver training and our next race.

Additional Information:

If the team's proposal receives funding, WEEF's contribution would be recognized as follows: recognition on team website, recognition on newsletter, recognition on team shirt, recognition on support trailer, and recognition on the solar car itself. Please note that the size of recognition on team shirt, support trailer, and solar car is directly proportional to the amounts paid.

Contact Information for funding if different than above:

Name: Philip Garcia
E-mail: pr2garci@engmail.uwaterloo.ca
Phone Number: 519-888-4567 x32978
Position: Student Designer

Title:

North House (Solar Decathlon) - Integrated Control System Hardware

Submitted By:

Name: Ivan Lee
E-mail: ifunley@gmail.com
Phone Number: 416-726-0280
Team/Department: Team North / Department of Civil and Envirionmental Engineering
Position: Project Engineer

Description of Proposal:

North House is the University of Waterloo's entry to the 2009 Solar Decathlon organzied by the US Department of Energy which teams must design, construct, and operate a modular and energy efficient solar home. One of the features that is integral to the performance of the house is the automated smart control system. All of the systems of the house are designed to be fully automated to operate to optimize the energy efficiency of the house. Team North is currently designing and building an automated control system for North House. This system will control and monitor the weather conditions, lighting, HVAC, interior and exterior blinds, electrical production and consumption, solar thermal production, water consumption systems.

Proposal Benefits:

This project will allow over 20 members of Team North to gain some knowledge in the design and construction of an automated control system. Members of the team will get hands on experience in working within an integrated design environment which often involves frequent contact with manufactures and vendors, thus fostering industrial relationships that are beneficial to the students' professional development. In addition, members of the team will be exposed to control hardware and monitoring equipment including sensors which provide insight into engineering research and an understanding to the operation of this house. This automated control system also has an educational component, it will notify the user on how their decisions can impact the energy perfromacne of the home to promote responsible behaviour. Finally, after the competition the North House will be used as a research facilitiy allowing students to modify certain components of the home to assess its impact on energy.

Cost Breakdown:

Insert a simple cost breakdown summary (including partial funding options) here.

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
Duct CO2 and Temp/RH Sensors	$1,000.00	$1,224.00	$876.00	$0.00
Outdoor Temp/RH Sensors	$500.00	$358.00	$612.00	$0.00
Tank Temp Sensors	$500.00	$729.00	$438.00	$0.00
Water Flowmeters	$1,200.00	$1,161.00	$1,329.00	$0.00
Dataloggers	$428.00	$660.00	$398.00	$0.00
Siemens PLC	$455.00	$700.00	$565.00	$0.00
TOTAL:	$4,083.00	$4,832.00	$3,653.00	$ 0.00

Implementation Schedule:

May-June: Systems Architecture Design
May-June: Control logic development
June-July: Procurement of controls hardware
July-August: Implementation of control logic
August-September: Testing
September-October: Full system integration with completed house

October-November: Solar Decathlon Competition
January-Feburary 2010: Vancouver Olympics
March 2010: Start of 5 year research period

Additional Information:

The Solar Decathlon is a biennial competition which 20 qualified teams must design, build and operate an energy efficient solar home. The competition attracts an ever growing amount of visitors and media coverage. Just like other engineering compeitions, like the FSAE, Solar Race Car and Alternative Fuels teams, Team North will represent the University of Waterloo to a global audience at the 2009 Solar Decathlon. This project has already attracted a lot of interest from the student body, with over 100 students involved in this project as designers and volunteers in various roles including 4th year design projects and technical electives. With funding from WEEF the team can continue to develop the home and get more students involved.

Contact Information for funding if different than above:

Name: Same as above
E-mail:
Phone Number:
Position:

Title:

Sustainable Technology Education Project (STEP) - Bike Generator Electronics

Submitted By:

Name: Andrew Marston
E-mail: andrew.marsty@gmail.com
Phone Number: x 38716
Team/Department: Mechanical Engineering - Solar Thermal Research Lab (PRC 3009)
Position: Graduate Student

Description of Proposal:

In the spring of 2008, STEP received $250 from WEEF in order to put together a prototype bicycle generator. The idea behind the project is to have volunteers use pedal power to produce grid quality electricity in orer to supply power to various devices, from light bulbs to sound equipment. We have since successfully designed and built a reproducible generator unit and electronic system to smooth the power output and maintain a steady supply. We are now at the point at which additional generator units are being completed so that more power can be produced, but in order to successfully combine this power an improved electronic system is needed. Our eventual goal is to use at least ten bike generators to supply upwards of 1 kW of power.

Proposal Benefits:

Human-powered generators are a great way of drawing attention in order to promote sustainable energy sources, allowing volunteers to gain a physical appreciation for the amount of work that is required to power everyday electronic devices. Attention can be easily drawn to the differences in power requirements for energy-efficient vs. wasteful devices, such as fluorescent/LED vs. incandescent light bulbs. Furthermore, by combining the power of multiple generators at campus and community events (bike-powered concerts and movies, pledge drives: "pedal-away a ton of CO2", etc.) will serve as an excellent demonstration of how to overcome some of the realistic challenges faced by alternative energy systems (unsteady/intermittent power supply, etc.).

This project is a useful tool in providing hands-on design and fabrication experience for many of the 50+ active STEP members. It also has great potential for use in future fundraising activities.

Cost Breakdown:

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
Xantrex Pro Sine 1000 Watt inverter	$971.50		$971.50	
Xantrex Xpower Inverter 1750W		$299.99		$299.00
20 Farad (or higher) Ultracapacitor (~15 Volt)	$200.00	$200.00	$100.00	$100.00
misc. components for over-voltage protection circ.	$100.00	$100.00	$50.00	$50.00
mat'l & motor for additional generators ($60 each)	$300.00	$300.00	$120.00	$120.00
Cabinet to house electronics (~$20 each)	$100.00	$100.00	$40.00	$40.00
TOTAL:	$1,671.50	$ 999.99	$1,281.50	$ 609.00

Implementation Schedule:

Sept. 2008 - prototype designed, built, and successfully implemented
Dec. 2008 - improved bike stand designed and built, for easy future reproduction
May 2009 - generator showcased at clubs day, attracting much attention

June - forever - showcase generator(s) at various campus events
July 2009 - To have a total of three working generators
July (mid) 2009 - Implement improved electronic system, allowing three (or more) bikes to combine power
Dec 2009 - have a total of five working bike generators

Additional Information:

If we can purchase a higher quality inverter (such as the Pro Sine), we will be able to supply true sine wave power to devices, allowing us to safely power all possible electronics (including computers, televisions, etc). This is thus the preferred inverter choice, as we've found that the modified sine wave power of cheaper inverters cannot power certain devices.

STEP's overall goal is to promote the use and awareness of sustainable energy technologies throughout campus and the community. STEP was responsible for the installation of the solar photovoltaic panels on the roof of FED hall in 2004, and has since been working toward funding the installation of solar thermal panels on the V1 residences.

Contact Information for funding if different than above:

Name: Same as above
E-mail:
Phone Number:
Position:

Title:

Sustainable Technology Education Project (Step) - Solar Cookers

Submitted By:

Name: Andrew Marston
E-mail: andrew.marsty@gmail.com
Phone Number: x 38716
Team/Department: Mechanical Engineering - Solar Thermal Research Lab (PRC 3009)
Position: Graduate Student

Description of Proposal:

STEP would like to build a solar barbecue and solar oven for use on campus as a means of technology demonstration and fundraising. The solar barbecue will be a concentrating collector (made of highly reflective, thin aluminum sheet metal, held by a wooden frame of cylindrical/parabolic shape, with an opening aperture of approximately 2m by 1m) to concentrate sunlight onto the underside of the cooking surface (to be a length of wide stainless steel channel with the underside painted black). This will be used for cooking hotdogs, hamburgers, chicken, etc.. The solar oven will be a box with a window on the top surface to accept solar gains. Exploiting the greenhouse effect, this oven can be used to bake cookies, cook rice dishes, etc.

Proposal Benefits:

This project will allow many of the over 50 active members of STEP to gain some hands on experience in the design and construction of solar thermal collectors. Once built, the solar cookers will prove a useful tool in the campus- and community-wide promotion and demonstration of a sustainable technology, with particular value in developing countries. Finally, the cookers will be a valuable source of fundraising through weekly on-campus barbecues, aiding STEP in the raising of funds for our longer-term goal of installing solar thermal collectors on the roof of the V1 residence (to cost approximately $40,000).

Cost Breakdown:

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
highly reflective sheet aluminum	$40.00	$40.00	$40.00	$0.00
plywood & wood lengths for concentrator frame	$40.00	$40.00	$40.00	$0.00
stainless steel channel (cooking surface)	$25.00	$25.00	$25.00	$0.00
black paint, screws, nuts & bolts, misc. pcs.	$25.00	$25.00	$15.00	$0.00
insulated steel box, or wooden box (for oven)	$40.00	$15.00	$0.00	$0.00
coated window glass, or plexiglass (oven window)	$25.00	$10.00	$0.00	$0.00
TOTAL:	$ 195.00	$ 155.00	$ 120.00	$ 0.00

Implementation Schedule:

May-June - design and discussion took place
June 17th - construction of concentrator wooden frame began
July 1st - aiming to have construction complete so that fundraising events can begin
July (mid) - begin construction of solar oven
August (mid) - finish oven construction

Additional Information:

STEP's overall goal is to promote the use and awareness of sustainable energy technologies throughout campus and the community. STEP was responsible for the installation of the solar photovoltaic panels on the roof of FED hall in 2004, and has since been working toward funding the installation of solar thermal panels on the V1 residences.

Contact Information for funding if different than above:

Name: Same as above
E-mail:
Phone Number:
Position:

Title:
University of Waterloo Nanorobotics Group Proposal

Submitted by:
Name: TD Nguyen
E-mail: h11nguye@engmail.uwaterloo.ca
Phone Number: 226-338-5910
Team/Department: University of Waterloo Nanorobotics Group
Position: Business Development Officer

Description of Proposal:
The University of Waterloo Nanorobotics Group (UW_NRG) is an undergraduate student group that gives engineering students the unique opportunity to work on high-level research and applications. With the guidance of Dr. Yavuz and Dr. Ramahi, as well as with working closely with many other professors, graduate students, and companies, the University of Waterloo Nanorobotics Group is currently designing and developing a 300µm robot. The robot design incorporates many novel features and materials, including an air-powered microfluidic system, optical power and control scheme, and a cup-shaped manipulator to name some. The robot is planned to compete at the 2009 RoboCup Competition in the NanoGram division held in Graz, Austria. The design has already been featured at the 2008 Undergraduate Nanotechnology Competition as a technical poster as well as received acclaim from researchers in Taiwan, Japan, and across Canada. In order to compete in Austria, we will need to create a software program utilizing machine vision to observe and direct the robot. In order to compete effectively, a high-definition camera system will be needed for our team in addition to our current equipment.

UW_NRG is also taking steps toward furthering our research in near future. Some of these ideas include the smallest inductively coupled power transfer and control systems, material bonding, and nanowire research. UW_NRG plans to win the 2009 RoboCup Competition and to continue to develop unique technologies in the fields of nano- and microelectromechanical system and nanomaterials.

Proposal Benefits:
The University of Waterloo Nanorobotics Group may be the only research group of its kind. The group is composed almost entirely of undergraduate engineering researchers developing unique ideas and technologies. The University of Waterloo is already recognized a being at the forefront of nanotechnology with the development of the Waterloo Institute for Nanotechnology (WIN), and will continue to benefit from the ideas and research generated from UW_NRG.

Also, this allows for undergraduate students to actively participate in and conduct cutting edge research. Normally, a student must approach a professor and join his or her project. In the case of UW_NRG, students are encouraged to come up with their own ideas. They are able to design, simulate, test and publish their own work. This gives students invaluable experience for both co-op and graduate research positions.

The group has also represented Waterloo internationally at the Canada Japan Innovation Week and at the Nanotech Expo in Tokyo, Japan. With such participation, the UW_NRG brand, along with that of WEEF and the University of Waterloo, have appeared in front of researchers and administrators from countries including Japan, Korea, Taiwan, UK, Italy, and Finland.

Funding Levels:

Levels of Sponsorship

Level One:	
Agilent 3320A Function Generator	$2300
Total:	$2,300

Level Two:	
3x Zaber Technologies KT-LS13-M Linear Actuators	$3800
Total:	$3800

Level Three:	
Agilent 3320A Function Generator	$2300
3x Zaber Technologies KT-LS13-M Linear Actuators	$3800
Total:	$6100

Additional Information:

The University of Waterloo Nanorobotics Group has taken many steps to reduce the cost of the project. The team has had fabrication facilities available free of charge through the co-operation of professors within the University. Also, materials ranging from servers and software to clean room suits and optical equipment have been donated from the likes of Sun Microsystems and ANSYS to Kimberly-Clark Scientific and The Imaging Source, which has further decreased our costs.

Title:

University Of Waterloo Robotics Team Weef Proposal S09

Submitted By:

Name: Craig MacKenzie
E-mail: cemacken@gmail.com
Phone Number: 519-502-5604
Team/Department: UWRT
Position: Exec

Description of Proposal:

The UW Robotics Team is continuing to increase the scale of its projects while still remaining flexible in the support of new projects and ideas. We have just returned from the Intelligent Ground Vehicle Competition in Michigan and are working to improve our entry for next year while supporting a variety of other projects including an autonomous sailboat and an entry into the University Mars Rover Competition. We are also preparing for our annual mini sumo robotics compeition in the fall, which we will be running in association with the IEEE. We are requesting funding for the following from WEEF:
IGVC Receipts: $1559.71
Remote Control Transmitter/Receiver: $250
Sumo Competiton Supplies: $500
Outdoor Lidar (Hokuyo UTM-30LX): $1500

Proposal Benefits:

The UW Robotics Team has at least 40 active members from all years. Having returned from our first entry into IGVC we will be putting the experience to work revamping our entry for next year. Active developement is continuing with the Sailbot project which upon completion will be eligible for several competitions. We are also developing an entry into the University Mars Rover competition in affiliation with the UW Space Society. Our annual sumo competition exposes first year and other interested students to the principles of robotics. The robotics team continues to provide hands on and practical experience to students of all years and discplines while gaining attention at a variety of international competitions.

Cost Breakdown:

Insert a simple cost breakdown summary (including partial funding options) here.

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
IGVC Receipts	$1,559.71	$1,559.71	$1,059.71	$1,059.71
Remote Control Transmitter/Receiver	$250.00	$0.00	$250.00	$0.00
Sumo Competition	$500.00	$500.00	$500.00	$400.00
Outdoor Lidar	$1,500.00	$1,250.00	$1,000.00	$1,000.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
TOTAL:	$3,809.71	$3,309.71	$2,809.71	$2,459.71

Implementation Schedule:

The IGVC funding will be spent immediately as the parts have already been purchased and have already been integrated with the robot. The remote control and lidar will be integrated as soon as they arrive, while the sumo funds will be used over the summer and early fall as prepartion for the upcoming competition ramps up.

Title:

The University Of Waterloo Underwater Technology Team: Subrinna Autonomous Capabilities Upgrade.

Submitted By:

Name: Oleg Petelin
E-mail: o.d.petelin@gmail.com
Phone Number: 226-339-8584
Team/Department: Software Team
Position: ,Software and Financial

Description of Proposal:

UW2TT is a student team that develops submersible vehicles for the MATE and AUVSI competitions. We have built an innovative underwater ROV, named SUBrinna, and have successfully qualified to compete in the 2009 international MATE ROV this June. The competition challenges teams to research submersible rescue systems through rescue simulations.

Building on our experience from previous ROV development, we plan to enhance SUBrinna with the required autonomous capabilities to represent the University of Waterloo at the prestigious AUVSI Autonomous Underwater Challenge in 2010. This goal is realizable through the addition of sensory equipment, on-board power supply, an advanced manipulator, and enhanced artificial intelligence programming.

Proposal Benefits:

UW2TT is a highly competitive group that seeks to push the boundaries of student innovation, and provide opportunities for engineering students across a broad range of disciplines. Over the last year, our team has grown vastly in member base and ability. The number of opportunities for student involvement have grown accordingly. UW2TT helps to reinforce material learned during class by connecting exciting and relevant engineering challenges with students' studies. Throughout the year, we offer a number of tutorials and provide technical mentorship in various upper-year concepts.

The proposed autonomous capabilities upgrade is a major step in UW2TT's growth. It will ensure that student opportunities continue to develop, and will also provide significant benefits to the university. By participating in the AUVSI, we will help maintain UofW Engineering's image as one of the foremost engineering schools in North America, and will gain valuable international exposure for UofW.

Cost Breakdown:

Requested funding in order of importance

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
Battery packs & student-designed monitoring boards	$540.00	$540.00	$540.00	$540.00
Camera, underwater sonar, and underwater housing	$785.00	$785.00	$785.00	$785.00
Control box, circuit breakers, networking equip.	$425.00	$425.00	$425.00	$425.00
Brushless PM motors (thrusters)	$590.00	$590.00	$590.00	$0.00
Arm components, & student-designed control boards	$2,100.00	$2,100.00	$0.00	$0.00
Competition fees, transportation	$1000.00	$0.00	$0.00	$0.00
TOTAL:	$5,440.00	$4,440.00	$2,340.00	$1,750.00

Implementation Schedule:

July 2009 – Components sourced and designed for mechanical arm, housings
Aug. 2009 – Designs for batteries, circuit board mounts, initial circuit board designs
Sept. 2009 to Dec. 2009 – Arm assembly, circuit board fabrication, sensor mounting
Jan. 2010 & Feb. 2010– Arm control algorithms completed, initial AI design
March 2010 to May 2010 – Competition analysis, modify designs to meet competition requirements, AI finalization
June 2010 – MATE ROV, final AI tuning
July 2010 - AUVSI competition

Additional Information:

Our team will continue to recognize WEEF's support by placing your logo on our sponsorship webpage and including the logo in all our newsletters as well as a giant logo on our vehicle.

Contact Information for funding if different than above:

Name: Nathan Buchanan
E-mail: nbinont@gmail.com
Phone Number: (226) 220-7321
Position: Software/Financial lead

UW Intelligent Robotics & RobotRacing

Submitted By:
Name: Jeffrey Gorchynski
Email: goUWIRE@gmail.com, robotracing@gmail.com
Team: UW Intelligent Robotics Experiments Group
Position, : Co-head desiger

Description of Proposal:

RobotRacing is a friendly competition between Canadian universities where teams attempt to construct the fastest automated vehicle that can navigate a small scale racetrack with obstacles and specific rules. The UW Intelligent Robotics Experiments Group (UWIRE) created the RobotRacing competition two years ago and organizes it annually. To date, the racecourse has been fairly easy to navigate, though still requiring a moderate level of 'intelligence' in each of the teams' entries. UWIRE strives to make the course more difficult to navigate every year, to encourage creative development in the field of intelligent robotics. To make the course more challenging, UWIRE proposes that WEEF invest in this competition, and in the UWIRE team's entry.

Proposal Benefits

This competition promotes innovation in automation and robotics, with a focus on intelligent vehicles that can learn to drive themselves through a variety of conditions. UW's Mechatronics Engineering program gets excellent exposure through competitions such as Robotracing, which raise awareness of current issues in the field of robotics, and encourage students to gain hands-on experience creating robotic vehicles. The UWIRE group provides the opportunity for undergraduate students to work with participating graduate students on a self-directed team, applying techniques from across fields of engineering outside of their labs. Participants gain practical knowledge using and adapting components to real-world situations. However, the benefits of this participation are limited by the quality of the materials available to UWIRE. The difficulty of the challenges involved in the RobotRacing competition and the UWIRE team entry can be greatly improved with better components. Additional funding from WEEF will allow the UWIRE team to acquire high-quality components for use in the competition, and for the UWIRE team.

The RobotRacing competition attracts entries from all over Canada, with teams entering from as far as BC. With an impressive host of challenges to compete in, competitors will be motivated to invest more time and expertise in their entries. This could raise the prestige of the competition considerably, which would reflect very well on the University's Faculty of Engineering and improve its image as a school that leads the way in innovation and produces top-tier engineers.

Cost Breakdown

Item	*Option 1*	*Option 2*	*Option 3*
Futaba 6EX 6-hannel 2.4GHz Radio Sys	$ 244.43	$ 244.43	$ 244.43
Firgelli Automations 2 - 4 chnl Remote Control Sys	$ 75.83	$ 75.83	$ 75.83
2 x Draganfly 2.4GHz Wireless Colour Cam	$ 555.54	$ 555.54	$ 555.54
2 x Mindsensors NXTcam V2 Vision Sensor	$ 352.76	$ 352.76	$ 352.76
Hagisonic StarGazer Robot Localization Sys	$ 1,088.89	~~$ 1,088.89~~	~~$ 1,088.89~~

Hokuyo URG-04LX Scanning Laser Rangefinder	$ 2,632.22	$ 2,632.22	~~$ 2,632.22~~
Hokuyo PBS-03JN Infrared Obstacle Detection Sys	$ 1,527.10	$ 1,527.10	$ 1,527.10
Wowwee Rovio Mobile Robotic Webcam	$ 333.32	$ 333.32	$ 333.32
ADC-212/50 & ADC-212/100 PC Oscilloscopes	$ 394.11	$ 394.11	$ 394.11
2 x Remote Controlled Vertical-Translation System	$ 286.32	$ 286.32	$ 286.32
TOTAL:	$ 7,490.52	$ 6,401.63	$ 3,769.41

Implementation Schedule

The current RobotRacing competition will be held on July 11th 2009, but planning for the next competition will begin immediately afterwards, once feedback is collected from this year's competitors. By August 2009, we hope to have a good idea of the capabilities for UWIRE's robot for next year's competition and what new challenges can be added to the race. Additionally, by the end of September, we hope to have completed all prototypes for the competition itself (including moving obstacles, and so on) and have the hardware platform for our entry complete.

Title:

Uw Micro Aerial Vehicle Team Funding Proposal

Submitted By:

Name: Yi Le
E-mail: y2le@engmail.uwaterloo.ca
Phone Number: (416)319 6267
Team/Department: UWMAV/Mechanical and Mechatronics Engineering
Position: Fixed Winged Aerial Vehicle Designer

Description of Proposal:

The UWMAV team seeks to design and construct prototypes of automated fixed winged and flapping winged aerial vehicles for the IMAV 2010 competition. The project requires contribution from mechanical and mechatronics engineering students. The proposal requests funding for the initial development of MAV prototypes by mechanical engineering students. The majority of the funding will be used to purchase raw material and off the shelf items for the construction of fixed winged and flapping winged vehicles. The optimal scenario would be to construct 3 functioning prototypes for each design. A portion of the funding will may also be used to purchase books and journals of interest to MAV design.

Proposal Benefits:

The project is a starting point for future MAV competition entries. The team provide hands-on experience for mechanical engineering students who wish to gain more knowledge in fluid dynamics and aircraft design. Furthermore, the project also provides hands-on experience for mechatronics students who wishes to work on robotics and controls design.
The funding will directly benefit two seperate teams consisting of 9 mechanical engineering students developing the two types of MAV prototypes (fixed winged and flapping wing teams). The extended beneficiaries will be subsequent mechatronics students who will be developing controls and autopilots for the MAV prototypes.

Cost Breakdown:

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
Books and Journals	$300.00	$300.00	$200.00	$200.00
Supplementary equipments (ex: battery chargers)	$200.00	$200.00	$200.00	$200.00
Construction material for fixed wing design	$1,200.00	$1,000.00	$800.00	$600.00
Construction material for flapping wing design	$1,200.00	$1,000.00	$800.00	$600.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
TOTAL:	$2,900.00	$2,500.00	$2,000.00	$1,600.00

Implementation Schedule:

June 2009: As part of ME481, two teams of students will separate work on the conceptual designs for fixed winged and flapping winged MAV
July 2009: Construction of the working prototype will be built and tested before the end of the term
Winter Term 2009: Prototype designs will be improved based on experimental results and subsequent design models built. Concurrently, the autopilot and controls will be developed by mechatronics students.

Additional Information:

Reference Contact:
Professor S. Waslander
UWMAV Supervisor
Department of Mechanical and Mechatronics Engineering
Tel: (519) 888 4567 x 32205
Email: stevenw@uwaterloo.ca

Contact Information for funding if different than above:

Name: Yi Le
E-mail: y2le@engmail.uwaterloo.ca
Phone Number: 14163196267
Position: Fixed Winged MAV Designer

Title:

Waterloo Engineering Competition

Submitted By:

Name: Kevin Liu
E-mail: k13liu@engmail.uwaterloo.ca
Phone Number: (519) 729-6980
Team/Department: Waterloo Engineering Competition
Position: Director of Competitions

Description of Proposal:

The Waterloo Engineering Competition (WEC), formerly the OEC Qualifiers, is a new initiative to select the most talented engineering students to represent UW at the provincial and national engineering competitions. The junior and senior design competitions now involve a hands-on component. Due to an unexpected large volume of participants this term, the WEC is lacking sufficient funding for the design competitions.

The proposed budget is used towards building materials, tools and equipment. The WEC would like to purchase, stage by stage, quality and durable tools that can be used every competition. With OEC 2010 at UW, we can also lend our tools.

Proposal Benefits:

The Waterloo Engineering Competition is currently undergoing expansion. From ~20 students in the past, we increased the number of participants to more than 110 this term. Our goal is to accommodate up to 250 students in the near future; sign-up is on a first-come-first-serve basis.

The primary objective of the WEC is to increase UW's competitiveness at the OEC. Past experiences have indicated that a hands-on component is key.

The Waterloo Engineering Competition is a great opportunity for employer networking opportunities. We invite co-op employers at design judges. Students have the chance to meet employers who are experts in the category that they are competing in.

It is crucial that the initial launch of the Waterloo Engineering Competition is successful, to show employers why they should help, and even sponsor, the WEC in the future.

By sponsoring, the WEEF logo and description will be displayed on the WEC website to recognize the contribution and to promote WEEF.

Cost Breakdown:

Insert a simple cost breakdown summary (including partial funding options) here.

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
DC motors	$95.46	$95.46	$50.00	$50.00
Stranded hook-up wire and solder	$139.46	$139.46	$139.46	$139.46
Wire strippers	$44.16	$44.16	$44.16	$44.16
Toggle switches	$50.66	$50.66	$50.66	$50.66
Battery holders	$51.15	$51.15	$51.15	$51.15
Pliers, scissors, x-acto knives, glue guns	$130.00	$65.00	$65.00	$0.00
TOTAL:	$ 510.89	$ 445.89	$ 400.43	$ 335.43

Implementation Schedule:

Competition problem research and prototype - completed
Building material and tool purchase - completed
Spring 2009 Junior Team Design - June 26-27, 2009
Spring 2009 Senior Team Design - June 26-27, 2009

Additional Information:

Insert any additional information here.

Contact Information for funding if different than above:

Name: Insert Name Here
E-mail: Insert E-Mail Here
Phone Number: Insert Phone Number Here
Position: Insert Position Here

Title:

Waterloo Space Society - Rover Team Supplies

Submitted By:

Name: Pablo Molina
E-mail: pmolina@engmail.uwaterloo.ca
Phone Number: 226-339-0438
Team/Department: Waterloo Space Society/ Mars Rover Team
Position: Software team Lead

Description of Proposal:

The "Waterloo Space Society - Rover Team Supplies" proposal is a fundamental donation to the Mars Rover Challenge Team. The Waterloo Space Society, will enter a team into the 2010 University Rover Challenge held by Mars Society International. Now in its 4th year, university students enter the competition by designing and building the next generation of Mars Rovers. This proposal requests funding to support acquisition of a computer equipment for the robot, cameras, bolt taks equipment, electronic power circuit boards, mechanical parts and batteries etc.

Proposal Benefits:

Benefits for UW engineering faculty/ students:
1) UW engineering exposure in scientific/engineering community on an international level.
2) Provide a stage for UW students to compete with international universities.
3) Continuous Engineering design project - intention to enter annualy.
4) Students will gain a wide spectrum of valuable learning and design experience/skills: problem solving, scientific researching (biology, geology, communications, etc), software modelling, simulation, electronic and mechanical design/manufacturring/assembly, components implementation and integration, system debugging.
5) Designing for Space applications, an area UW does not currenlty do a lot of work in, but student demand exists.
6) Team environment skills: team participation, leadership, mentorship, financial planning (sponsorship, costing, negotiating prices)

Cost Breakdown:

Insert a simple cost breakdown summary (including partial funding options) here.

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
Robot Computer	$800.00	$800.00	$600.00	$0.00
Cameras	$1,000.00	$600.00	$600.00	$0.00
Hardware (circt brds, batteries, etc)	$800.00	$800.00	$800.00	$0.00
Mechanical Parts(chassis, mountings, etc)	$400.00	$200.00	$200.00	$0.00
Bolt Task equipment (actuators, robotic arm)	$500.00	$500.00	$400.00	$0.00
Control Server Computers and laptops	$2,000.00	$1,500.00	$1,500.00	$0.00
TOTAL:	$5,500.00	$4,400.00	$4,100.00	$ 0.00

Implementation Schedule:

Summer 2009:
Design and software developing phase. We plan to start the development of the main pieces and star researching and designing the robotic arm for the bolt task. In addition, a design of the chassis and power circuit is planned

Fall 2009: Completing mechanical design of the chassis and software. the competition rules will be available by this time and hence the team will be able to start designing and building the components for the new tasks.
Winter 2010:Testing, debugging

Additional Information:

The Mars Society University Rover Challenge takes place at the Mars Desert Research Station (Utah). In 2009, five American and one Canadian university (York) and one Polish team entered the challenge to compete in four distinct tasks. York University won the 2009 competition.The competition was featured by Scientific American, InformationWeek, and The Space Review and is good publicity for UW.

Contact Information for funding if different than above:

Name: Insert Name Here
E-mail: Insert E-Mail Here
Phone Number: Insert Phone Number Here
Position: Insert Position Here

Title:

Power Electronic Modules For Power Engineering Lab -- MTE-320 Support

Submitted By:

Name: Ed Spike
E-mail: spike@uwaterloo.ca
Phone Number: 519-573-7683
Team/Department: Insert Team/Department Here
Position: Insert Position Here

Description of Proposal:

To have an additional power electronics equipment in order to have better learning experience while studying the speed control of DC motor using power electronics converter. Open-loop and closed-loop control system applications can be studied. The MTE-320 class is very large and thus has a schedling problem since 7 to 8 sessions have to be used over a two week period. The lab material may lead the lecture material for most lalb studies.

Proposal Benefits:

Increase of stations from 7 to 14 (in the case of Option 1).
Decrease the number of undergraduate-students per station from 4 to 2.
Useful for courses such as ECE362, ME 269, MTE 320. MTE 320 will use these additional stations in S09.
Total number of students to be benefitted: ECE362 (84+84 F, W terms), ME269 (126+108 for F, W terms) and MTE320 (112) = 514 students yearlyNote that this proposal benefits 32% ECE and 68% MME.

Cost Breakdown:

Insert a simple cost breakdown summary (including partial funding options) here.

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
PID controllers - $875.00 ea	$6,125.00	$4,375.00	$2,625.00	$0.00
Speed Sensor/Tachometer - $954.00 ea	$6,678.00	$4,770.00	$2,862.00	$0.00
Enclosure/Power Supply - $1008.00 ea.	$7,056.00	$5,040.00	$3,024.00	$0.00
Voltage&Current Isolation Module- $365 ea	$2,555.00	$1,825.00	$730.00	$0.00
Firing Angle Control Module - $415 ea	$2905.00	$2490.00	$830.00	$0.00
Taxes (9.67%)	$2168.00	$1549.00	$974.00	$0.00
TOTAL:	$27,487.00	$20,049.00	$11,045.00	$ 0.00

Implementation Schedule:

Send the PO in July 2009. Equipment delivery on 1 Sept 2009 to be used in F09 term.

Additional Information:

Quotations to be updated.

Contact Information for funding if different than above:

Name: Ed Spike
E-mail: spike@uwaterloo.ca
Phone Number: 519-573-7683
Position: Insert Position Here

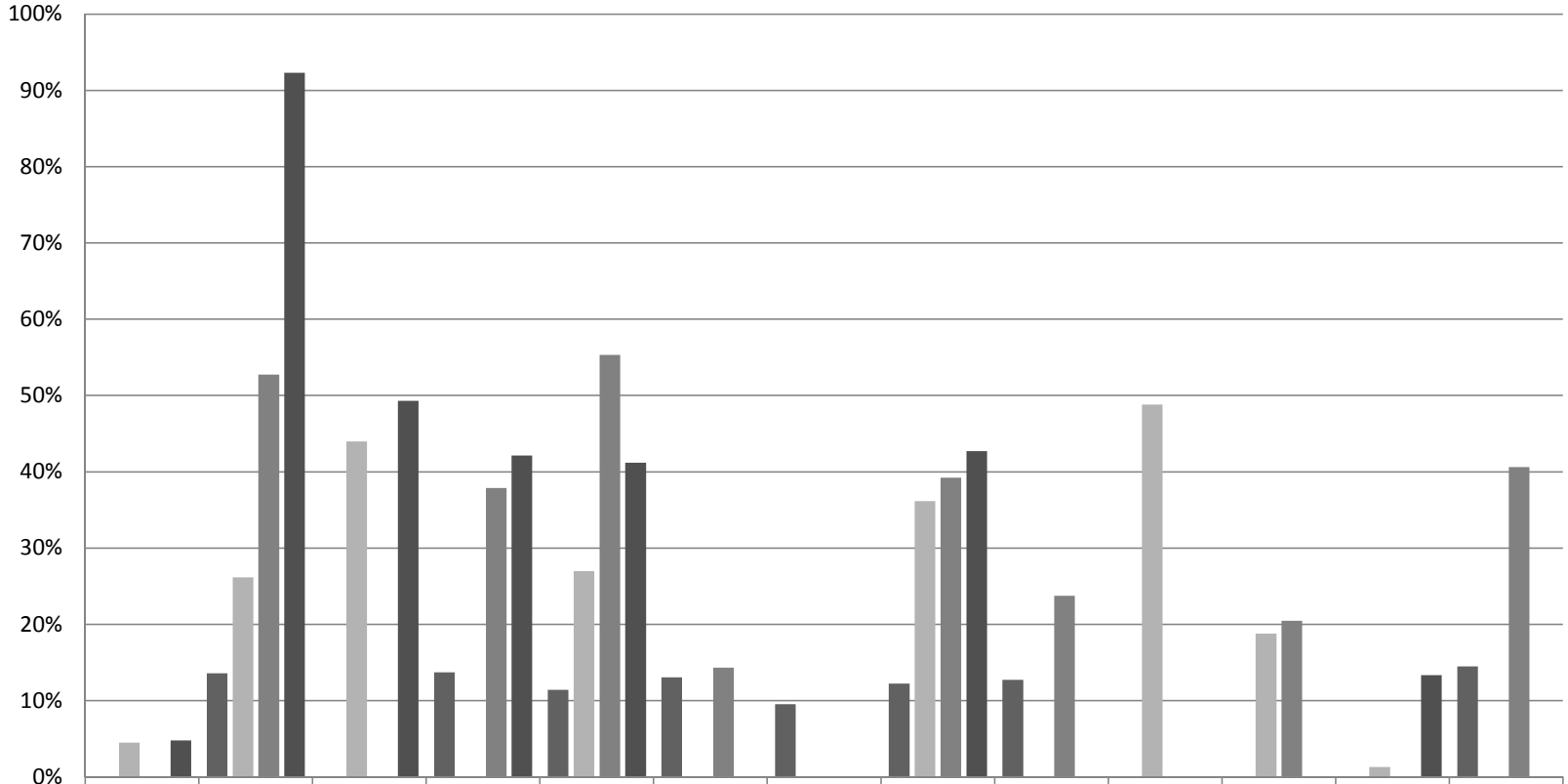
Appendices

#	Page	Proposal	Requested	Allocated	% of Requested	# Students Affected	Act. Balance (May 2009)	% of All Eng. Population	% Participation	% of Student Population Contributing	W09 Funding	F08 Funding	S08 Funding
		Architecture					$ 5,387.34	5.30%	95%	5.04%	$ 11,310.72	$ 10,638.40	$ 8,760.00
1	3	Acm Laboratory Computers	$36,953.00	$ 8,694.82	24%	300							
2	4	Rhinoceros 3d Lab Kit	$975.00	$ 975.00	100%	300							
		Total	*$37,928.00*	*$9,669.82*									
		Chemical Engineering					$ 3,742.54	10%	53%	5.30%	$ 4,652.00	$ 3,200.00	$ 8,760.00
3	5	Computer Aided Teaching Room Computer Upgrades	$52,802.64	$ 13,100.00	25%	412							
		Civil Engineering				$ 2,228.99	$ (277.53)	6.60%	54%	3.56%	$ 3,151.00	$ 16,600.00	$ 4,302.00
6	9	Civil Stapler	$17.99	$ 27.99	156%								
7	10	Instrumented Truss Construction System	$3,802.45	$ 2,201.00	58%	336							
		Total	*$3,820.44*	*$ 2,228.99*									
		Electrical and Computer Engineering					$ 6,635.06	30.80%	69%	21.25%	$ 17,326.69	$ 12,952.00	$ 12,657.68
8	12	Laboratory Monitor Upgrade	$5,400.00	$5,400.00	100%								
9	13	Linux Computers to Replace Sun Computers	$4,600.00	$2,300.00	50%								
10	14	Nexus Computer Upgrade	$8,800.00	$2,200.00	25%								
		Total	*$18,800.00*	*$9,900.00*									
		Geological Engineering					$ -	1.40%	94%	1.32%	$ -	$ -	$ -
11	15	Laboratory Specimens	$9,010.00	$ 2,250.00	25%	20							
		Management Engineering					$ -	1.70%	51%	0.87%	$ -	$ -	$ -
12	16	Dale Carnegie Course for Management Engineers	$15,000.00	$ -	0%	35							
		Mechanical and Mechatronics Engineering					$ 3,240.00	22.20%	82%	18.20%	$ 13,462.00	$ 10,000.00	$ 12,060.00
13	18	Rankine Power Cycle Teaching Laboratory	$9,411.00	$ 9,411.00	100%	300							
14	19	Robotics Platform for Me 595	$8,675.00	$ 3,435.00	40%	25							
35	54	Power Electronic Modules for Power Engineering Lab	$27,487.00	$ 3,966.00	14%	500+							
		Total	*$45,573.00*	*$ 16,812.00*									
		Systems Design Engineering					$ 12,380.54	6.50%	74%	4.81%	$ 4,097.00	$ 4,097.00	$ 6,740.00
15	21	Bench Equipment for Teaching Lab	$4,097.50	$ 4,097.50	100%	3, ?							
		Departments Total	$187,031.58	$ 58,058.31									

		Engineering Student Teams				# Students Affected	Act. Balance (May 2009)	W09 Funding	F08 Funding	S08 Funding	
16	22	Chem-E-Car	$600.00	$ 600.00	100%	8	?	$ -	$ 2,000.00	$ -	
17	23	Clean Snowmobile Team	$6,400.00	$2,850.00	45%	17	$ 12,526.67	$ 1,750.00	$ 2,000.00	$ 2,604.00	
18	25	Concrete Toboggan 2010	$3,000.00	$ 1,250.00	42%	25	$ (2.45)	$ 450.00	$ -	$ 2,150.00	
19	26	Engineering Orientation	$2,000.00	$ 500.00	25%	125, 1400	$ 1,987.00	$ 1,750.00	$ -	$ 2,000.00	
20	27	Engineering Society Guest Speaker	$300.00	$ -	0%	100	$ -	$ -	$ -	$ -	
21	28	Engineers Without Borders	$580.00	$ 580.00	100%	?	$ -	$ -	$ -	$ -	
22	29	Formula SAE	$4,700.00	$ 2,200.00	47%	65	$ 5,223.15	$ -	$ 2,700.00	$ 3,000.00	
23	30	IGEM Competition	$1,750.00	$ 900.00	51%	20	$ 1,568.71	$ 600.00	$ 600.00	$ 400.00	
24	32	The Iron Warrior	$1,355.00	$ 450.00	33%	5, 2500	$ 181.50	$ 362.00		$ 1,130.00	
25	33	Midnight Sun	$6,500.00	$ 2,300.00	35%	100	$ 4,615.61	$ 1,750.00	$ 3,000.00		
26	35	North House (Solar Decathlon)	$4,832.00	$ 2,750.80	57%	100	$ -	$ -	$ -	$ -	
27	37	STEP - Bike Generator + Solar Cookers	$1,866.50	$ 1,000.00	54%	35	$ 3,993.16	$ -	$ -	$ 250.00	
28	41	University of Waterloo Nanorobotics Group	$6,100.00	$ 1,800.00	30%	15	$ 1,623.36	$ 1,200.00	$ 1,000.00	$ 2,000.00	
29	43	University of Waterloo Robotics Team	$3,809.71	$ 2,000.00	52%	40, 100	$ 2,410.96	$ 1,454.00	$ 1,980.00	$ 4,188.00	500 for sumo i
30	44	University of Waterloo Underwater Technology Team	$5,440.00	$ 1,750.00	32%	25	$ 5,328.57	$ 1,545.00	$ 1,890.00	$ 1,600.00	
31	46	UW Intelligent Robotics Experiments Group	$7,490.52	$ 1,500.00	20%	25	$ 558.00	$ 558.00	$ -	$ 1,952.58	
32	48	UW Micro Aerial Vehicle Team	$2,900.00	$ 2,000.00	69%	15	$ -	$ -	$ -	$ -	
33	50	Waterloo Engineering Competition	$510.89	$ 510.89	100%	100	$ -	$ -	$ -	$ -	
34	52	Waterloo Space Society	$5,500.00	$ 2,000.00	36%	45	$ 265.70	$ 1,500.00	$ 1,300.00	$ -	no computers
		Student Teams Total	*$65,634.62*	$ 26,941.69							
		Grand Total	*$252,666.20*	$ 85,000.00							

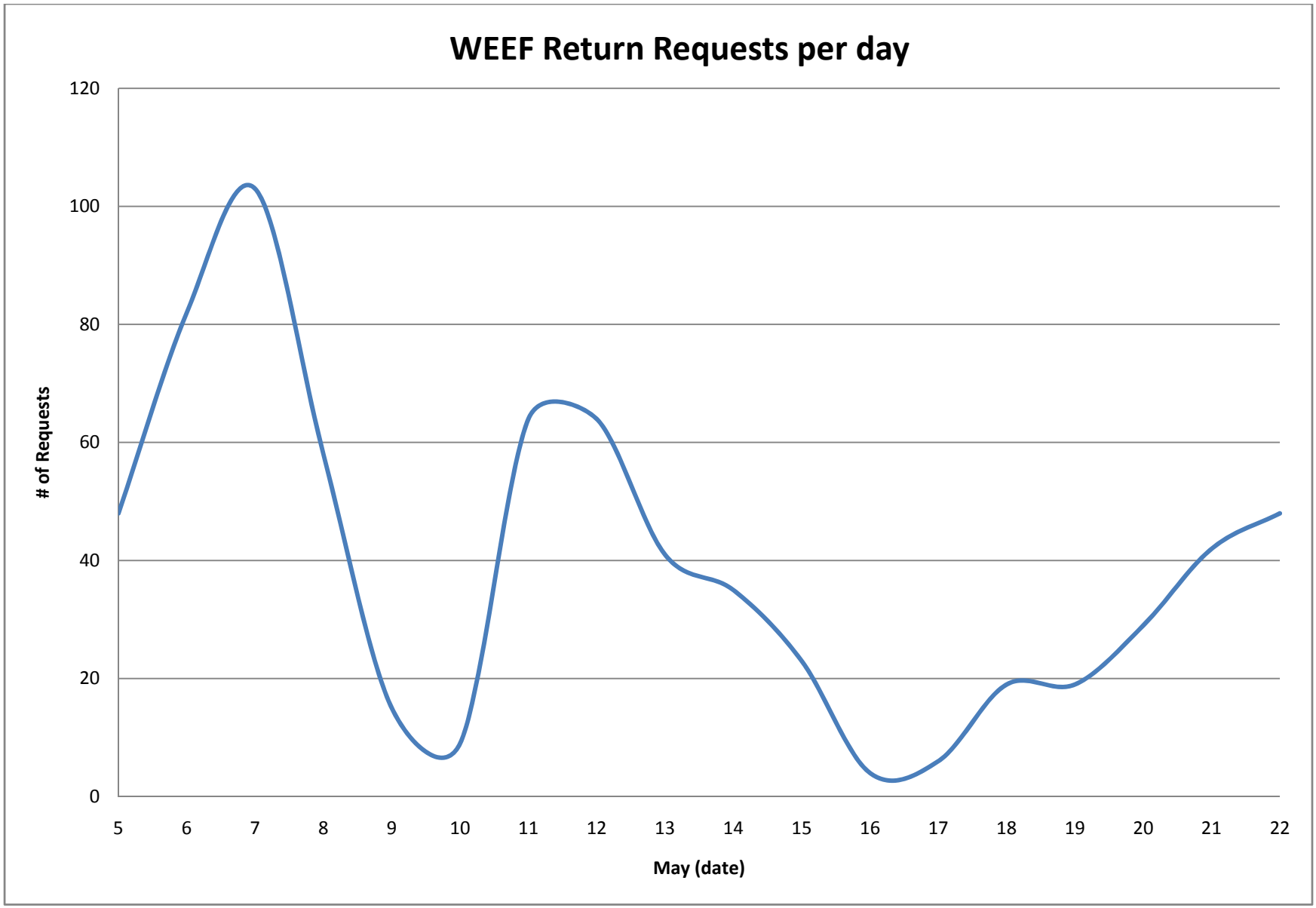
WEEF Returns Spring 2009

(Higher value means class got more returns)



	ARCH	CHE	CIVE	COMPE	ELE	ENVE	GEOE	ME	MECTR	MGTE	NE	SE	SYDE
1 st Year		14%		14%	11%	13%	10%	12%	13%				14%
2nd Year	4%	26%	44%		27%			36%		49%	19%	1%	
3rd Year		53%		38%	55%	14%	0%	39%	24%		20%		41%
4th Year	5%	92%	49%	42%	41%			43%				13%	

Total # of Returns Requested: 685/2449 = 28% Return Rate = 72% Participation Rate


WEEF Return Requests per day
120
100
80
60
40
20
0
# of Requests
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
May (date)