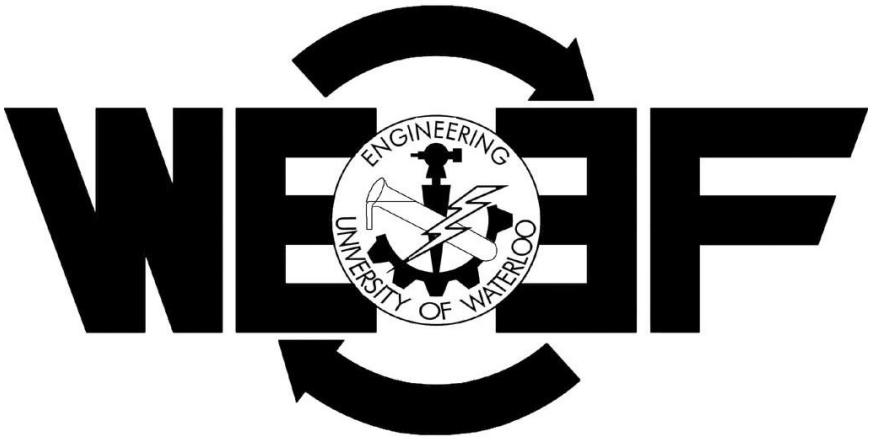

PROPOSALS

Spring 2010

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28	41	UWAFT	$8,685.00	
29	43	FSAE	$3,050.00	
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35	54	Robotics	$4,601.99	
36	55	WatSat	$4,050.00	
37	57	WOMBAT	$3,400.00	
38	58	UW ASIC - AllSparc	$2,250.00	
		Student Teams Total	$86,377.26	
39	60	[MISC] Computers for WEEF Laboratory	$51,000.00	
		Grand Total	$380,132.81	

Title:

Dimension SST 1200es 3D Printer

Submitted By:

Name: Heinrich Koller E-mail: hkoller@architecture.uwaterloo.ca Phone Number: x27602
Team/Department: Architecture Position: abrication Lab / Workshop Manager
Room/Building Location of Equipment: Fabrication Lab - School of Architecture
Approximate Number of Undergraduate Uses: 285
Engineering Undergrad Courses: Architecture Studio courses - all years of undergraduate

Description of Proposal:

A Dimension SST 1200es 3D printer for use by undergraduates at the School of Architecture

Proposal Benefits:

The purchase of an ABS printer will be made available to undergraduates, to expand students ability to create rapid prototypes and models. All students will be able to benefit from the use of the printer throughout their undergraduate studies.

The purchase of the 3D printer will bring the School of Architecture back up to speed with current fabrication methods, ensuring its relevance as a school of architecture in the current economy, where other schools such as Ryerson, and the University of Toronto have made much larger contributions ($100,000's) to updating their fabrication technologies.

There are many new equipment items needed however it has been decided that the school would benefit greatest from the purchase of a 3D printer.

Estimated Equipment Lifetime

10 - 15 years - 1 year Extended Warranty included

Cost Breakdown:

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
Dimension SST 1200es 3D printer - full package	$33,400.00			
Support Funding for Dimension SST 1200es - (A1)		$10,000.00		
Support Funding for Dimension SST 1200es - (A2)			$6,000.00	
TOTAL:	$33,400.00	$10,000.00	$6,000.00	

Implementation Schedule:

Option A0 - Full funding would allow for the immediate purchase of 3d printer, with plans to implement it in as soon as it is delivered - Spring 2010

Option A1/A2 - Staged Funding of the 3d printer would allow the School of Architecture to accumulate funding over the next 3 terms of study, allowing for other sources of funding to assist in the purchase of the 3d printer. Other sources include Graduate student Funds / The School of Architecture / Outside donations.

Additional Information

Dimension SST 1200es Printer
Education Supplies -Plastic Modeling Bases (Case of 24 - reuseable) / ABS Soluble Support Cartridge / ABSPlus Model Material Cartridge
Extended System Warranty - 1 Year
Support Cleaning Apparatus

Contact Information for funding if different than above:

Name: Aurelia Adams
E-mail: apadams@uwaterloo.ca
Phone Number: 519 716 4958
Position: WASA WEEF Representative

Title:

Air Cleaners

Submitted By:

Name: Heinrich Koller E-mail: hkoller@architecture.uwaterloo.ca Phone Number: 519 888 4567 (x27602)
Team/Department: Architecture Position: Fabrication Lab / Workshop Manager
Room/Building Location of Equipment: Fabrication Lab - School of Architecture
Approximate Number of Undergraduate Uses: 285
Engineering Undergrad Courses: Architecture Studio courses - all years of undergraduate

Description of Proposal:

Air Cleaners for the workshop.

Proposal Benefits:

The purchase of the Air Cleaners will allow the workshop to be filtered properly, creating a better working environment. The current equipment(Maybe give some examples) generates a lot of dust and the two air cleaners currently installed do not create the proper circulation. The addition of two more Air Cleaners will allow for proper air filtration thus optimizing the use of the two existing Air cleaners previously purchased for the School of Architecture by WEEF.

Estimated Equipment Lifetime

20 years with regular maintenance.

Cost Breakdown:

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
Air Cleaners	$1,300.00			
Air Cleaner 1		$650.00		
Air Cleaner 2			$650.00	
TOTAL:	$1,300.00	$650.00	$650.00	

Implementation Schedule:

Option 1 is to purchase both air cleaners together and improve the air filtration at once.
Option 2/3 is to purchase one air cleaner one semester and another air cleaner the next semester.

Additional Information

Installation costs included.

Contact Information for funding if different than above:

Name: Aurelia Adams
E-mail: apadams@uwaterloo.ca
Phone Number: 519 716 4958
Position: WASA WEEF Representative

Title:

Canon VIXIA HF M31 and Equipment

Submitted By:

Name: Matthew Oliver
E-mail: m3oliver@uwaterloo.ca
Phone Number: 519 888 4567 (x27602)

Team/Department: Architecture
Position: Systems Manager
Room/Building Location of Equipment: Computing Lab - School of Architecture
Approximate Number of Undergrad Use: 285
Engineering Undergrad Courses: Architecture Studio courses - all years of undergraduate

Description of Proposal:

5 Canon VIXIA digital video cameras as well as supporting equipment for use by undergraduates at the School of Architecture

Proposal Benefits:

The purchase of 5 Canon VIXIA video cameras will be made available to all undergraduates, not only to replace the outdated video cassette recorders, but to allow students more flexibility and ease when creating and editing videos for classes and architectural related uses. All students will be able to benefit from the use of the camera throughout their undergraduate studies.

The purchase will bring the School of Architecture back up to speed with current video-capturing technology, ensuring that all students can produce the highest quality videos with the current software that the school provides. By replacing the current cassette recorders, students would not need to buy individual cassettes (which are now harder to find) and can either use their own SD memory card or the hard drive memory built into the camera itself.

Although there is a need to upgrade the audio and video lab, it comes to our attention that these video cameras would first and foremost benefit the student population before any computer lab replacements will be made.

Estimated Equipment Lifetime:

10 - 15 years - 3 year Extended Warranty included

Cost Breakdown:

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

Item	Option #1	Option #2	Option #3	Option #4
Canon VIXIA HF M31 Full Package (A0)	$5,300.00	$5,300.00	$0.00	$0.00
3 year extended warranty for each camera	$700.00	$0.00	$0.00	$0.00
2 year extended warranty for each camera	$0.00	$550.00	$0.00	$0.00
TOTAL:	$6,000.00	$5,850.00	$0.00	$ 0.00

Implementation Schedule:

Option A0 - Full funding would allow for the immediate purchase of 5 Canon cameras, 5 extra batteries and 5 carrying cases for each camera as well as two full tripods (2 heads and 2 legs), with plans of immediate use upon its purchase and arrival - Spring 2010

Extended camera warranties would need to be purchased in order to ensure extended product lifetime, preventing it from damage and allowing it to run as efficiently as possible.

Additional Information:

Video Camera: Canon VIXIA HF M31
Supporting Equipment:
5 Extra Canon Video Camera Batteries

Tripods:
Head: Manfrotto Pro-Vid Head 501-PL
Legs: Manfrotto 190XPROB Tripod

Contact Information for funding if different than above:

Name: Quan Thai
Position: WASA WEEF Computing Representative
E-mail: qtthai@uwaterloo.ca
Phone Number: 226 868 2172

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
Room/Building Location of Equipment:
Approximate Number of Undergraduate Uses:
Engineering Undergrad Courses:

Description of Proposal:

This is the continuation of a proposal submitted in Summer 2009 and granted $13K S09 and W10. At that time WEEF promised to continue to fund the remainder of the proposal in future terms. 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 objective of this proposal is to double the number of student stations from 30 to 60 while increasing the usable desktop space by mounting CPU housings on the back of LCD monitors which will replace existing CRTs.

Proposal Benefits:

The CHEMCAT room DWE 1507 currently 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 would also improve student productivity. This will be accomplished by replacing CRT monitors with smaller foot print LCD monitors and mounting workstation housing units to the back of the monitors . The upgrade from the existing P4 based workstations to Core 2 duo based workstations will also improve user response times.

Estimated Equipment Lifetime

Cost Breakdown:

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
21 Core I5, 2 Gig, 250 Gig HD workstations @$600	$12,600.00	$12,600.00		$6,600.00
21 Acer X223WBD LCD monitors @$185	$3,885.00		$3,885.00	$2,035.00
1 HP Procurve 2626 switch @$450	$450.00	$450.00		$450.00
Taxes	$2,201.55	$1,696.50	$505.06	$1181.05
TOTAL:	$16,100.00			

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 the remaining 21 workstations and monitors. Option 2 requests funds for 21 workstations less the monitors. Option 3 requests funding for 21 monitors. Option 4 requests funds for 11 workstations and monitors.

Title:

Fluidization And Fluid Bed Heat Transfer Unit.

Submitted By:

Name: Siva Ganeshalingam E-mail: sganesha@uwaterloo.ca Phone Number: 36161
Team/Department: Chemical Engineering Position: Laboratory Manager
Room/Building Location of Equipment: DWE-1514
Approximate Number of Undergraduate Uses: 200.
Engineering Undergrad Courses: ChE-390, ChE-391 and ChE-490.

Description of Proposal:

The proposed unit has been designed to provide visual and quantitative results related to the flow of air through both apacked and a fluidized bed of granular material. The bed chamber is constructed of thick glass and has an internal diameter of 0.105 m and a length of 0.220m. Air is used as the fluidizing medium, with the flow rate is measured by a rotameter. The air is introduced through a distributor that is designed to provide both uniform air distribution over the column cross section and support for the solid material in the non-fluidized state. The bed can be heated with a resistance heater positioned horizontally in the bed. Thermocouples with digital indicators measure the heating element, air inlet and bed temperatures.

Proposal Benefits:

The proposed equipment could be used to do experiments in Fluid Mechanics, Heat Transfer and Reaction Engineering suitable for ChE-390, ChE-391 and ChE-490 courses. This equipment has been used by University of Dayton, Ohio for many years. They claim that the hardware is very durable and provided them years of reliable experimentation with limited maintenance requirements. There are in built safety devices to prevent the heater temperature exceeding the set value and also a relief valve to prevent the pressure build up.

Estimated Equipment Lifetime

Glass chamber: Infinite time unless mishandled
Heater: 10 years
Thermocouples and digital indicators: 10 years.

Cost Breakdown:

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
Fluidization and Fluid bed heat transfer unit	$14,196.00			
TOTAL:	$14,196.00			

Implementation Schedule:

Purchase in July 2010 and the equipment will be installed ready for the students to use it for the Fall 2010 term.

Contact Information for funding if different than above:

Title:

Envrironmental Field Samplers

Submitted By:

Name: Mark Sobon E-mail: msobon@uwaterloo.ca Phone Number: 35263
Team/Department: Civil/Environmental Engineering Position: Laboratory Technician
Room/Building Location of Equipment: DWE-3506.
Approximate Number of Undergraduate Uses: 40 per year
Engineering Undergrad Courses: ENVE.330 Field Sampling.

Description of Proposal:

There is a need for a set of standard field sampling equipment. The DH-59 depth integrated sampler for the purpose of obtaining representative depth integrated sample from a lakes. A Kemmerer water sampler for the purpose of obtaining depth specific samples. An Ekman dredge for the purpose of obtaining sediment samples from lake beds.

Proposal Benefits:

The field samplers would be used in the ENV E.330 Surface water sampling lab to provide for obtaining field samples using standard practices and equipment. Also, will be used in Civ E. 400 lab and project activities.

Estimated Equipment Lifetime

10+years(2 equipment generations).

Cost Breakdown:

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
DH-59 Depth Integrated sampler	$1,050.00			
Kemmerer Sampler 2.2 L	$694.00			
Ekman Dredge 6x6	$684.00			
TOTAL:	$2,248.00			

Implementation Schedule:

Immediate.

Contact Information for funding if different than above:

Title:

Coulomb's Law Apparatus

Submitted By:

Name: Mike Foulger E-mail: mpfoulge@uwaterloo.ca Phone Number: 36135
Team/Department: ECE Position: Lab Instuctor/Electronic Service Technologist
Room/Building Location of Equipment: E2-3346
Approximate Number of Undergraduate Uses: 460
Engineering Undergrad Courses: ECE106 Physics of Electrical Engineering Pt. 2, NE241

Description of Proposal:

Purchase of two additional sets of Coulomb's Law Apparatus and a set of spare Parts

Proposal Benefits:

E2-3346 is equipped for 25 working stations. The construction of the Coulomb's Law Apparatus used in ECE106 includes a very delicate stainless steel torsion wire which often breaks. It is not unusual for two or more units in one lab session to break or malfunction in some way. It takes about an hour to replace the broken wire, adjust and recalibrate one unit. This means that there is no time between a morning lab and an afternoon lab to have the broken unit readyfor the next lab. It also means that a lab instructor has to repair the unit in the evening readyfor the for the next day.Unusable stations put a lot of pressure the running of the lab; therefore, having spare units would help the labs to run more smoothly and provide a more effective learning environment. If a unit breaks during the lab, a spare unit can quickly be put in place so that a student group can continue with the experiment and thus avoid having to repeat the lab. In fact redoing labs is becoming very difficult due to the very tight scheduling of lab facilities in addition to the complex scheduling of students. The units described are very maintenance intensive and require calibration / adjustment prior to each lab session which is time consuming and hard to do if there are broken units to be fixed in time for the next lab.

We would also like to purchase some miscellaneous spare parts for servicing the Coulomb's Law Apparatus. There are small parts that get lost or broken and have to be replaced often.

The apparatus associated with ECE 106 Labs, including the units described are kept in locked storage areas when not in use and are under the supervision of a lab istuctor at all times when set-up and a lab is running. Labs are securely locked when the lab room is not in use. At the moment these facilties are used for all students taking ECE106 plus other courses and will be shared with the Nanotech dept. until they move to their new building.

Estimated Equipment Lifetime

10 Years

Cost Breakdown:

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
1) 2x PASCO EX-9930 Coulomb's Law Aparatus	$3,623.00			
2) Various Spare Parts for above apparatus	$500.00			
TOTAL:	$4,123.00			

Implementation Schedule:

We would like to have the extra units for the Fall 2010 term and the spare parts as soon as possible to carry out necessary maintenance on existing equipmentas we have no spare parts as yet.

Title:

E&CE Linux Cluster Upgrade

Submitted By:

Your Name: Eric Praetzel E-mail: praetzel@engmail Phone #: x35249
Department: Electrical and Computer Position: Lab. Staff, Hardware Specialist
Eng. UG courses: core courses ECE 327, 438, MTE241, ECE 254/354, SE 350 at least

Description of Proposal:

I propose to upgrade the ECE undergraduate Linux computing cluster.

Proposal Benefits:

The speed increase is slight - measured 5% but will be 12% to 25% with faster CPUs which are coming out.
Six CPU cores support more users per computer than the current quad core CPUs as does the RAM increase (8G increasing to 12G or 16G) while reducing the number of computers and power draw.

Estimated Equipment Lifetime

3 to 4 years based upon past experience before the equipment is moved into other uses.

Cost Breakdown:

Item	RAM	RAM, MB	#1 + #2	Server + #1
RAM 2x4G DDR3	$560	$560	$1120	$1120
motherboard		$110	$110	$110
6-core CPU				$250
TOTAL	**$560**	**$670**	**$1230**	**$1480**

Implementation Schedule:

August 2010

Additional Information:

The existing 4-core computing cluster of 4 computers was purchased W09 with $2850 from WEEF
One server (ECELinux1) has already been upgraded to a 6-core CPU by the Dept but it only has 8G of memory using 2G sticks. Upgrading this will require the "2 x 4G RAM upgrade" to achieve 12G.
Adding a 2nd 6-core computer will allow ECELinux4 to be retired.
Both of the computers could take an additional "2 x 4G" memory upgrade up to their max of 16G

The new motherboards allow a max of 16G, as opposed to 8G, of RAM which can support more students per computer and more memory intensive applications (Fourth Year Projects? ASIC student group?). The 6 core CPUs have the same power draw (or less) than the existing quad cores - so upgrading 2 computers in the cluster will allow one of the quad-cores to be retired reducing cluster power draw by 25%.

The first quad-core upgraded will trickle to become the new WebObjects Application server (replacing an old power hungry Sun computer). RAM from the older quad-cores can be used to upgrade lab computers from 1G to 2G (this benefits computers in E2-2364 and E2-2363).

I suggest the RAM upgrade ($560). The RAM and MB upgrade would reuse the 4-core CPU ($670), would allow us to wait until the faster 6-core CPUs (3.0, 3.2 and 3.4GHz) are available and drop in price.

Title:
E&CE Laboratory Monitor Upgrade

Submitted Summer 2010 By:

Your Name: Eric Praetzel E-mail: praetzel@engmail Phone #: x35249
Department: Electrical and Computer Position: Lab. Staff, Hardware Specialist

Description of Proposal:

I propose to replace 1998/2000 vintage 17”/19" monitors in the Fourth Year Projects Lab (E2-3339), Microwave Lab (E2-3342), Circuits lab (E2-3344, E2-3346) and Controls lab (CPH-3682).

Proposal Benefits:

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

Estimated Equipment Lifetime:

7 to 12 years based upon past experience.

Cost Breakdown:

20” LCD Monitors: $190 ea

Total – any amount up to $3,800 (20 LCDs), ideally 5 minimum ($950)

Implementation Schedule:

August 2010

Additional Information:

The FYDP (Fourth Year Design Symposium) lab equipment, 10 stations, is used for the yearly FYDP Symposium. Having LCDs in that room would make them available for the yearly symposium and reduce LCDs pulled out of working 1st/2nd/3rd year labs.

The Microwave lab, 20 stations, uses old 17” CRTs that were being surplussed by Science in 2007.

The Controls lab, 10 stations, currently uses 17” CRTs from 1998.

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 10 year old 19” CRTs 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 LCDs. My first priority will be to upgrade a few in the FYDP lab (for the Symposium), then the Microwave lab, then the Controls lab, lastly the Circuits and FYDP labs.

Priority:

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

Title:

E&CE Nexus Computer Upgrade

Submitted Summer 2010 By:

Your Name: Eric Praetzel E-mail: praetzel@engmail Phone #: x35249
Department: Electrical and Computer Position: Lab. Staff, Hardware Specialist
Eng. UG courses: core courses Controls lab (ECE 484 ECE option &core MechaTronics, ECE 486)

Description of Proposal:

I propose to replace the old Pentium IV computers (E2-3342 Microwave lab, CPH-3682 Robotics lab) with new computers to address performance and comfort issues.

Proposal Benefits:

Software will run 2x faster and new computers will use about 75% less electricity. The new computers will be capable of running Windows 7 when that upgrade is required.

Computer systems like these 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.

Estimated Equipment Lifetime:

5 to 8 years based upon past experience.

Cost Breakdown:

2.7GHz dual-core AMD computers with 2G RAM: $475ea (taxes included)

Total – Ideally $3325 (Microwave lab) or $4750 (Robotics lab) but
any amount of funding will be appreciated.

Implementation Schedule:

August 2010

Additional Information:

The Microwave lab has 7 P IV's. The Controls lab has 10 Pentium IV computers.

Title:

E&CE Coldfire Server Upgrade

Submitted Summer 2010 By:

Your Name: Eric Praetzel E-mail: praetzel@engmail Phone #: x35249
Department: Electrical and Computer Position: Lab. Staff, Hardware Specialist
Eng. UG courses: ECE 254/354, SE 350

Description of Proposal:

I propose to replace the failing serial port cards on the Coldfire Server. http://cf-server.uwaterloo.ca

Proposal Benefits:

The existing serial port cards have been unreliable and hanging the server now and then during the past year - interrupting student use of the server.

Estimated Equipment Lifetime:

8 to 10 years based upon past experience.

Cost Breakdown:

$2k per 32-port serial card and I/O chassis [currently 2 are in the server]

Total: $1k or $2k WEEF funding (with the Dept. matching WEEF funding)

Implementation Schedule:

August 2010

Additional Information:

Note: The Department will match any WEEF funding for this upgrade as it is necessary.

The Coldfire server was originally set up with WEEF funding ($3600 W00) ten years ago!

The Coldfire server has 34 Coldfire computers connected to it. Via the internet anyone can connect and be assigned a Coldfire computer for the course work - allowing students to work on their labs without having to be physically in the labs. Download speeds (for the project) are >100x faster via the Coldfire server than they are in the lab using Nexus computer.

This upgrade has been pushed off because of an impending change in the ECE 354 labs - which may no longer require this hardware. However, the Soft Eng. equivalent course will continue to use the Coldfire Server.

As this will mean a reduction in the use of the server - it would be acceptable to downgrade the server from 2 x 32 serial ports to just a single 32-port serial card. A single 32-port card (WEEF providing $1k) would allow for a maximum of 16 Coldfire computers to be available and I believe that this would be acceptable.

Note: An older (8 year old) serial port card is available from our supplier (at about 1/2 the cost of the new equipment above); but I don't want to consider it as it's not being supported (no new drivers) and is advanced in age.

Priority:

High (life can go on without this, but it will be painful)

Title:

High-Performance, User-Friendly Simulation Package For Power Electronic Cirsuits

Submitted By:

Name: Mehrdad Kazerani E-mail mkazeran@ecemail.uwaterloo.ca: Phone Number: Ext. 33737
Team/Department: Department of Electrical & Computer Engineering Position: Professor
Room/Building Location of Equipment: Software to be installed on U of W system for everyone's use
Approximate Number of Undergraduate Uses: 90 ECE463 students (ECE & MME), 10 4YDP teams (ECE)
Engineering Undergrad Courses: Now: ECE463 (ECE & MME); in future: ECE463 (ECE) and MTE420 (MME)

Description of Proposal:

It is proposed here to purchse the latest version of the power electronic circuit simulation software PSIM to be installed on the U of W system and be used by undergraduate students who are having projects in power electronics (e.g., ECE 463 students and 4YDP teams).

Proposal Benefits:

The proposed simulation software will benefit a large number of students, especially those who take ECE 463 (and MTE 420 in the future). The class of power electronics in ECE (ECE463) has grown from 6 students in 1997 to close to 70 students in 2010. A new forth-year elective course on power electronics (MTE420) has been delivered to MME students with 10-20 students in the past couple of years. This number is expected to grow in the future. These students are assigned computer-aided design projcets in power electronics. The U of W already has a license for a 15-user PSIM software. The existing software is version 6.0, whereas the latest version available is 9.0, with a lot of additional features and modules that will facilitate simulation of power electronic circuits. The 4YDP teams working on power electronics-related projects will also benefit from this software, as some of them use the software to verify the correctness of their ideas and designs before making a prototype. An annual maintenance contract is optional, but not required. Everyone who has an account on NEXUS can be given access to the software. The proposed software is a 20-user version without maintenance contract.

Estimated Equipment Lifetime

The software will work indefinitely and should be upgraded in a few years.

Cost Breakdown:

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
PSIM Pro 9.0 Renewable Energy (RE) Combo Package	$10,000.00	$10,000.00		
Thermal Module	$1,700.00			
TOTAL:	$11,700.00	$10,000.00		

Implementation Schedule:

Purchasing date: As soon as possible, preferably in early July, 2010. Installation date: As soon as the software is received.

Title:

Power – Control Electronics – Additional Equipment to complete three stations

Submitted By:

Ed Spike, Laboratory Instructor
spike@uwaterloo.ca x33716 or 33815
Team/Department: ECE Dept

Description of Proposal:

To add power electronics equipment in order to improve a smoother deployment of the learning experience, and to improve the timing of delivery; while studying the speed, voltage and current feedback control of power electronics. Open-loop and closed-loop control system applications can be studied with more workstations. Some labs have to start before the material is lectured.

Proposal Benefits:

Increase of stations from 7 to 10: The MTE-320 course scheduling and deployment requires up to 54 group scheduled working stations: 54groups/10stations/day = 6 days to deploy. Decrease the number of undergraduate-students per station from 4 to 2. Useful for courses ECE362, ME 269, (F, W), ECE463/MTE420 (S,F) and MTE320 will need the use in S-2010 (if in time). Total number of students to be benefited: ECE362 (84+84 F, W terms), ME269 (126+108 for F, W terms) ECE463/MTE420 (40 + 20) and MTE320 (116): For 576 students yearly. ECE/MME funding will help with further expansion of basic non-control experiments.

Cost Breakdown:

Item	Option #1	Option #2	Option #3	Option #4
5 PID controllers $1310.00	$6550	$6550	$6550	$4375
3 Power Thyristors + 3 Thyristor Firing Units $2138	$6414	$6414	$6414	$2138
2 Tadem Rheostats + 2 Inertia Wheels $921	$1842	$1842	$556	0
1 Voltage/Current Isolator $500	$	$500	$500	$500
3 IGBT Chopper + 3 Control + 3 Power Diodes $2081	$6982	0	0	0
1 Inductive Load $582	582	0	0	0
TOTAL:	$22,870	$15,306	$14,020	$7,013

Implementation Schedule:

-Send the PO in June 2010. Equipment delivery on July to Sept 2010.
- Option #2 will complete 3 stations for MTE-320: No addition for ECE463/MTE420
- Option #3 will complete 2 stations for MTE-320:
- Option #4 will complete 1 station for MTE-320:

Additional Information:

Quotation was obtained.

Title:

New Mme Undergrad Lab

Submitted By:

Name: Sanjeev Bedi E-mail: sbedi@uwaterloo.ca Phone Number: 519 591 2485
Team/Department: MME Position: Professor
Room/Building Location of Equipment: E3X
Approximate Number of Undergraduate Uses: 240
Engineering Undergrad Courses: MTE100, MTE201, ME481, ME482

Description of Proposal:

Development of a new electronics lab that will include new mobile test benches, digital control simulators, and cable sets. We are replacing the current Lego Mindstorm simulator with new state-of-the-art digital controller (Arduino) with I/O modules that interface to sensors and actuators.

Proposal Benefits:

This new lab will supplement the only other lab space dedicated to and overbooked by the Mechatronics program. The space has been provided by the Dean and ECE. The current Lego Mindstorm is getting old expensive to maintain. The new system provides more contemporary hardware that one would currently find in industry allowing better content for resumes.

Estimated Equipment Lifetime

10 Years

Cost Breakdown:

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
50 Control Simulators	$5,000.00			
22 mobile test benches	$55,000.00			
44 cable sets	$8,800.00			
TOTAL:	$68,800.00			

Implementation Schedule:

They will be build immediately and used during the fall of 2010

Contact Information for funding if different than above:

Name:
E-mail:
Phone Number:
Position:

Title:

Fred Church Lab Computer Upgrade

Submitted By:

Name: Sanjeev Bedi E-mail: sbedi@uwaterloo.ca Phone Number: 519 591 2485
Team/Department: MME Position: Professor
Room/Building Location of Equipment: Fred Church Lab
Approximate Number of Undergraduate Uses: 400
Engineering Undergrad Courses: MTE320, MTE220, MTE325, MTE201

Description of Proposal:

Upgrade 23 computers which are a critical component of each station.

Proposal Benefits:

The current computers are 6 years old and have reached end of life and are getting expensive to maintain. New computers will run the new software much better.

Estimated Equipment Lifetime

10 Years

Cost Breakdown:

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
23 Computers	$16,100.00			
TOTAL:	$16,100.00			

Implementation Schedule:

They will be installed for the fall of 2010

Contact Information for funding if different than above:

Name:
E-mail:
Phone Number:
Position:

Title:

Hands-On Empirical Analysis Of Algorithms With A Real World Professional Profiler

Submitted By:

Name: Mark D. Smucker E-mail: msmucker@uwaterloo.ca Phone Number: x38620
Team/Department: Mangement Sciences Position: Assistant Professor
Room/Building Location of Equipment: CPH 4335
Approximate Number of Undergrad Use: 50 students in MSCI 240 plus other students in program
Engineering Undergrad Courses: MSCI 240: Introduction to Data Structures and Algorithms

Description of Proposal:

Students in MSCI 240 learn the fundamentals of algorithm analysis in class and obtain exposure to empircal analysis in several labs. At the present time, we only have the ability to measure the overall running time of programs. I would like to obtain a professional quality code profiler for the MSCI 240 students.

Proposal Benefits:

I have taught MSCI 240 twice and it has become apparent that it is hard to get students to see the connection between the theory of algorithm analysis and the actual execution of algorithms on real data. A profiler gives students a chance to see how time is spent in code on a line by line basis. This information is not easily obtainable with hand instrumentation of code. With a profiler, a student can actually see how an O(n^2) algorithm spends its time.

A profiler is a critical tool for developers of software much as a symbolic debugger is. While students can debug with print statements, it would be a disservice to the students not to provide them with a symbolic debugger. Introducing students to a profiler is important, much as it is important for a student to be introduced to an oscilloscope. For the management engineering students, I want them to be able to say someday to a team of developers, "Well, has anyone used a profiler to see where time is being spent?"

Estimated Equipment Lifetime:

Equipment (software): Red Gate .Net Developer Bundle. Includes the ANTS Profiler and other tools. I have spent considerable time negotiating with Red Gate. They are offering us the bundle of tools at the same rate that I had previously negotiated the profiler on its own. Red Gate normally licenses per person, but in our case, has agreed to license per machine for the 24 machines in CPH 4335 with a significant discount. (Normal cost for 24 licenses would be USD$19,080. Quote is for USD$3385 = CAD$3477.)

The software should be good for at least 3 to 5 years before becoming out of sync with Microsoft Visual Studio.

Cost Breakdown:

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

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
Red Gate .Net Bundle, 24 user license	$3477.00	$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:	$3,477.00	$ 0.00	$ 0.00	$ 0.00

Implementation Schedule:

We would purchase the software and install it prior to Fall 2010.

Additional Information:

N/A

Contact Information for funding if different than above:

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

Title:

Tools For Systems Design Undergraduate 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 2010

Description of Proposal:

This proposal is for buying new tools for our undergraduate teaching lab. These tools will mainly be used in Digital System and Cirucit courses. Our existing tools are old and does not work effectively.

Proposal Benefits:

Implementation of this proposal will benefit all Systems Design students. It will provide our students with better tools to carry out their lab assignemnts effectively.

Cost Breakdown:

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
Wire Strippers - QTY 40 Unit Price $15	$600.00	$0.00	$0.00	$0.00
Wire Cutter - QTY 40 Unit Price $15	$600.00	$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:	$1,200.00	$ 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:

3-D Printer For Mechanical And Mechatronics 3rd And 4th Year Design Courses

Submitted By:

Name: Jan Huissoon E-mail: jph@uwaterloo.ca Phone Number: ext.33595
Team/Department: Mechanical & Mechatronics Position: Professor
Room/Building Location of Equipment: E3X Church Lab
Approximate Number of Undergrad Use: > 250 per year
Engineering Undergrad Courses: MTE322, ME322, ME380, ME423, ME481, ME555

Description of Proposal:

It is proposed to purchase a uPrint Plus 3D printer for use in design and project courses. This printer is capable of producing functional parts in ABS with maximum dimensions of 203x203x152mm.

Proposal Benefits:

A 3D printer is fairly common equipment for prototyping mechanical engineering designs, yet undergraduate engineering students at UW do not have access or exposure to this technology. Having such a machine would also allow for closer coupling of courses, for example, MTE322 (Electromechanical Machine Design) could be more closely coupled with ME380 (Design project) by having students design, analyse, and produce a part in the Solidworks labs in MTE322 that could be used in the prototype design for ME380. ME481 (Design project) in which students are required to do a 'paper' design would also benefit from this equipment by allowing students to actually create prototype components to demonstrate their design. The printer will be housed in the office of a mechatronics engineer we are currently hiring, and who will also maintain and manage this. .

Estimated Equipment Lifetime:

5 years (estimate)

Cost Breakdown:

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
Dimension uPrint Plus 3-D printer	$26,175.00	$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:	$26,175.00	$ 0.00	$ 0.00	$ 0.00

Implementation Schedule:

The printer would be purchased before the end of the term (ready for use in the Fall 2010 term)

Additional Information:

50% of the cost of the equipment ($13,088) will be provided by the MME department and dean's office.

Contact Information for funding if different than above:

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

Title:

New Electric Keyboard For The Engineering Jazz Band

Submitted By:

Name: Erin Matheson E-mail: conductor@engjazzband.ca Phone Number: 226-220-8362
Team/Department: Engineering Jazz Band Position: Conductor
Total Number of Team Members: 30-50 per term
Percent of Team in Undergraduate Engineering: 95%

Description of Proposal:

The rhythym section of the band has been using the same electric keyboard for approximately the last ten years. They keyboard itself is of marginal quality and was donated to the band by a former member upon their graduation. Although the Engineering Jazz Band (EJB) recieves a term budget from the Engineering Society, there is rarely suffiecient funds for new capital purcahses as equipment required for a music group of this size are often very expensive when compared to the budget alloted. The EJB is currently looking to purchase a new electric keyboard that is of much higher quality to be used by both the band as well as other Engineering Society members.

Proposal Benefits:

The band will immediately benefit from the high sound quality and excellent playing interface of the keyboard we intend to purchase. It will be maintined and stored with the rest of of our current equipment in the currnet WEEF office. Currently, any undergrad student is allowed to use the EJB piano,so long as the band does not need to use it at that time, as the piano is property of the Engineering Society. Some Coffee House directors have done this in the past, but it has been a rare occasion due to the poor quality of the piano. Upon purchasing a new piano, other undergrad students including EngSoc Music and Music-Related directorships will be encouraged to use the piano if required as well. The one condition will remain that the EJB maintains priority for use of the piano for our weekly rehearsals and gigs throughout the therm should there ever be a conflict.

Estimated Equipment Lifetime

When cared for properly, keyboards of this caliber can last for at least as long as 10 years.

Cost Breakdown:

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
Yamaha P115 B Keyboard	$1,325.00			
TOTAL:	$1,325.00			

Implementation Schedule:

When the band recieves sufficient funding for this purchase, the keyboard will be purchased and put into use immediately.

Additional Information

The Engineering Jazz Band is a welcoming environment for undergrad students with musical interests, we accept all of our applicants and have not held auditions in our 5 years of operation. Having an opportunity for students with a high musical interest to have a constructive outlet such as EJB provides the perfect balance between school and extra-curricular as well as the chance to meet other 'musical' students in Engineering.

Title:

Engineering Orientation

Submitted By:

Name: Sean O'Neil E-mail: foc@engmail.uwaterloo.ca Phone Number:
Team/Department: Engineering Orientation Position: Engineering Federation Orientation Committee

Description of Proposal:

Engineering Orientation is requesting funding for equipment and materials for events during the week. Specifically this year FOC is looking for ways to improve communication between it's team members. This includes replacement of aged and broken megaphones and purchasing new radios for direction of our incoming first years as well as inter-leader communication over long distances. However, we understand that these tools cost a great deal and as such would like to provide another option of funding new material for our new Earn Your Hard Hat event, which replaces an older event we cannot use anymore.

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. The purchase of this equipment will help our student leaders communicate more effectively with first years via mass public address. It will also help leaders be more organized through faster and easier direction from FOC via radio. During Orientation Week we have over 1600 up and coming engineering students as well as over 400 student leaders as a part of the total student population on campus of 25000. This is a great occasion to expose WEEF to all of these new and returning students.

Estimated Equipment Lifetime

Orientation will be using these pieces of equipment yearly for as long as they are in working order, at least 10 years at the minimum for radios and 5 miniumum for the building materials. Radios can be utilized on open house days, conferences, and tour days. Regular cleaning and proper storage guidelines will be followed as directed by product manuals for any electronics. Everything will be stored securely in a locked storage unit when not in use. This equipment will be available for sign-out use by the Engineering Society and student teams upon request to Mary Bland or EngFOC. Buidling materials would be used for constructing a new mud-pit for the EYHH event of the same name (the materials were thrown away last year) as well as a new event requiring a large deal of planksfor crossing expanses of space as a team.

Cost Breakdown:

12 Motorola Two-Way CP-200 Radios from Spectrum Communications in Kitchener. 2x10x14' From HD.

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
CP200 Radios ($ 375 ea.)		$1,125.00	$750.00	$375.00
Lumber + Building Supplies for EYHH	$500.00			
TOTAL:	$500.00	$1,125.00	$750.00	$375.00

Implementation Schedule:

Any materials will be purchased as soon as possible in order to avoid the harmonized sales tax implementation date. Megaphones and Radios will be ordered online from a local vendor.

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, and distributed to students where possible as well as through verbal recognition, etc.

Contact Information for funding if different than above:

Name:
E-mail:
Phone Number:
Position:

Title:

IEEE Humanoid Robotics Team Funding Request For Mech Warfare Competition

Submitted By:

Name: Eugeniu Draco E-mail: edraco@engmail.uwaterloo.ca Phone Number: 519-591-6166
Team/Department: IEEE Humanoid Robotics Team/Electrical and Electronics Engineering
Position: Director of Business Development
Total Number of Team Members: 35
Percent of Team in Undergraduate Engineering: 95%

Description of Proposal:

The IEEE Humanoid Robotics Team is formed in 2009 under the IEEE UW Student Branch which focuses on exploring the field of humanoid robotics technology. The main goal of the team is to build robots which will be capable to compete in the RoboGames and potentially other humanoid robotics related competitions. Currently, we are improving our current bipedal robot to gain more stability and working on a new self-balancing platform for developing a robot with AI capbility. Moreover, a new project group is formed to develop system of 5 mini robots for competing in the Mirosot soccer league to investigate on cooperation among multiple robots. Another important project is the Desktop 3D Printer. This will enable the team to design and build a 3D printer to manufacture plastic parts, which can be used as components for humanoid robotics technology.

Proposal Benefits:

The Humanoid Robotics Team explores one of the most rapidly expanding field of robotics. This project allows engineering undergraduate students to gain technical and communication skills, and expose to the forefront of humanoid robotics research through an international competition. Participation at these kind of events promotes public awareness of the engineering field and its role in the industry and society. Success in the RoboGame will definitely improve international recognition of the University of Waterloo as a technological and innovation leader in. This will enable the Engineering Faculty to attract more bright students. Also, it will present an opportunity for various companies to evaluate University of Waterloo engineering students and appreciate their tallent and skills. As a result, students' employement rate upon their graduation or during coop terms can increase. Equipments and components will be reused in new projects. In addition to that, other engineering teams and graduate students will have access to 3D printer and other relevant equipment.

Estimated Equipment Lifetime

1. 3D Desktop Printer - 10 years
2. Desktop PC - 4 years
3. Multimeters - 10+ years

Cost Breakdown:

Each of the perspective projects includes materials, ($140-$400), electronic components ($150-$1600), and batteries and power supplies ($140 - 340$). Also, the IEEE team requires a desktop PC for design and simulation purposes, as well as various multimeters for testing and implementation process.

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
Humanoid Robotics kit	$1,600.00	$1,000.00	$750.00	$750.00
Electronics (motor controller, MCU, IMU, etc.)	$1,200,00	$800.00	$600.00	$400.00
On-board computer	$500.00	$400.00	$350.00	$350.00
14 High power motors and encoder	$1,600.00	$1,200.00	$800.00	$500.00
Batteries and power supplies	$700.00	$600.00	$500.00	$400.00

Electronic Sensors and communication modules	$920.00	$700.00	$500.00	$450.00
Materials and manufacturing	$960.00	$600.00	$500.00	$300.00
Desktop PC	$1,000.00	$820.00	$700.00	$760.00
Multimeters	$300.00	$200.00	$150.00	$150.00
TOTAL:	$8780.00	$6320.00	$4700	$4060.00

Implementation Schedule:

May - August, 2010:
- Redesigning the mechanical components of the current bipedal robot
- Complete the self-balancing platform
- Implement the prototype of the Mirosot Robot team
- 3D printer design and construction

September - December, 2010:
- Continue the design and implementation of the robots
- 3D printer construction and testing

January - April, 2011
- Finalizing the robots
- Testing the robot under various conditions
- Complete 3D printer project
- Participating at RoboGames

Additional Information

The HuRot has been holding meetings every Wednesday for project updates. Sponsors can visit (http://ieee.uwaterloo.ca) for the team's updates.

Contact Information for funding if different than above:

Name: Matthew Chan
E-mail: MatthewChan@ieee.org
Phone Number: 226-339-0289
Position: Director of Technical Projects

Title:

Entry To The University Rover Challenge 2011

Submitted By:

Name Thomas Haylock: E-mail: thaylock@gmail.com Phone Number: 519-888-4567 x36836
Team/Department: Waterloo Rover Team Position: Team Lead
Total Number of Team Members: 75 over the last year
Percent of Team in Undergraduate Engineering: 90%

Description of Proposal:

This proposal represents fundamental support towards UW's entry to the University Rover Challenge. The team was spawned as a partnership between the Waterloo Space Society and the UW Robotics Team to enter the University Rover Challenge hosted by the Mars Society. We made our first successful entry to the competition in June 2010 and achieved good results. University students enter the competition by designing and building the next generation of Mars Rovers.

We are asking for donations to purchase various core structural components for the design and construction of the Mars Rover. This proposal requests funding to support acquisition of a chassis, robotic arm, and partial funding for a spectrometer (already purchased).

Proposal Benefits:

Benefits for UW Engineering faculty/students:
1) UW engineering exposure in scientific/engineering community on an international level.
2) Annual Engineering design project - intent to enter each year
3) 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.
4) Designing for Space applications, an under-represented area on UW campus -- student demand exists.
5) Team environment skills: team participation, leadership, mentorship, financial planning (sponsorship, costing, negotiating prices).
Equipment will be stored within the secure Space Society Office and is accessible by section leads and core team members. The materials represent the building of space robotic capacity and knowledge base at UW.

Estimated Equipment Lifetime

Each of the items requested has excellent future use. The University Rover Challenge is an annual competition and appropriate momentum has been building to enter the comptetion in future years. While there are some changes to the competition year after year, core compents such as camera equipment, building materials, and power systems are required in any mobile robot.

Cost Breakdown:

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
Spectrometer - purchased June 2010	$1,000.00	$1,000.00	$1,000.00	$1,000.00
Robotic Arm Design (metal, motors, electronics)	$1,000.00	$1,000.00	$1,000.00	
Chassis Design (metal, motors, electronics)	$1,000.00	$1,000.00		
Motherboard	$300.00			
Cameras	$500.00			
TOTAL:	$3,800.00	$3,000.00	$2,000.00	$1,000.00

Implementation Schedule:

2010 - Design and equipment acquisition
Winter 2011 - Equipment acquisition, assembly
Summer 2011 - Testing and Competition (June)

Additional Information

The Mars Society University Rover Challenge takes place at the Mars Desert Research Station (Utah). In June 2010, we traveled to Utah for this competition. We were one of two Canadian teams and one of only three international teams. This was good exposure for Canada and the University of Waterloo.

Contact Information for funding if different than above:

Name:
E-mail:
Phone Number:
Position:

Title:

University Of Waterloo Nanorobotics Group

Submitted By:

Name: Shirley Ma E-mail: s2ma@engmail.uwaterloo.ca Phone Number: 519-897-5220
Team/Department: Nanorobotics Group Position: Business Development
Total Number of Team Members: 25
Percent of Team in Undergraduate Engineering: 100

Description of Proposal:

The University of Waterloo Nanorobotics Group (UW_NRG) is currently designing and fabricating a 500um robot for competition at the 2011 NIST Mobile Microrobotics Challenge. A function generator, digital multimeter, and some other auxiliary supplies are needed to assist in the contruction and testing of this electromagnetic device. These tools will additionally support the development of an optically-actuated microscale robot, the first of its kind in the world.

Proposal Benefits:

These tools will be available for use by all members of UW_NRG, all of whom are engineering students. This will assist in giving these students hands-on electrical engineering lab experience transferable to industry.

High-quality tools also allow for the fabrication of a more succesful robot. UW_NRG placed third at the previous NIST Challenge, competing against such top schools as Carnegie Mellon and ETH Zurich. The international exposure for Waterloo Engineering and WEEF specifically is an excellent boost to their profile and reputation.

WEEF stickers will be affixed to all WEEF-sponsored equipment. The WEEF logo is included on UW_NRG T-shirts and posters, and the WEEF name will be included in all press material. UW_NRG also attends other conferences and events across Ontario, giving WEEF additional exposure.

Estimated Equipment Lifetime

Function Generator: >20 years
DMM: >20 years
Soldering Iron: >20 years
Hot Glue Gun: 10 years
3km of 32gauge wire: 1 year
Electrical Tape: 1 year.

Cost Breakdown:

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
Function Generator	$1,500.00	$1,200.00	$800.00	$800.00
DMM	$300.00	$250.00	$250.00	$250.00
Wire	$100.00	$75.00	$50.00	
Soldering Iron	$50.00	$40.00		
Hot Glue Gun	$35.00	$30.00	$20.00	
Electrical Tape	$10.00	$5.00		
TOTAL:	$1,995.00	$1,600.00	$1,120.00	$1,050.00

Implementation Schedule:

The DMM, wire, soldering iron, hot glue gun, and electrical tape will be ordered and used immediately throughout all stages of robot development and testing.

The Function Generator will be in use by late July 2010 as the development of the optically-actuated robot progresses to a materials testing phase.

Additional Information

UW_NRG is proud to have WEEF as one of its top sponsors. Without WEEF's support, UW_NRG's progress to an internationally-recognized microrobtics research group would not have been possible. We appreciate WEEF's ongoing support in giving Waterloo engineering students a world-class opportunity for involvement in micro- and nanotechnology.

Contact Information for funding if different than above:

Name:
E-mail:
Phone Number:
Position:

Title:

Uwstart Climber Key Components

Submitted By:

Name: Brad Cotton E-mail: bcotten@engmail.uwaterloo.ca Phone Number: (519) 496-1711
Team/Department: UWSTART Position: Team Executive
Total Number of Team Members: 86
Percent of Team in Undergraduate Engineering: 95%

Description of Proposal:

UWSTART (University Of Waterloo Space Transport Advanced Research Team) is currently designing and building a prototype space elevator to compete in Spaceward Foundation's annual Power Beaming Climber Competition. The team has finished the majority of the design work for the model and we are ready to start building. The structural shell for the space elevator has already been constructed, however additional funding is required for many of the key climber components, such as the motor, battery, microcontrollers etc. UWSTART proposes to implement our space elevator design and complete the construction of our first model.

Proposal Benefits:

UWSTART gives UW engineering students with the opportunity to:

- Actively participate in the design of an innovative, cost-efficient mechanism for launching payloads into space
- Obtain hands on experience in a variety of engineering fields
- Compete against teams from across North America in an intense design competition
- Develop their team, leadership, organizational and planning skills by undertaking a large-scale engineering project
- Use the team resources to complete interesting 4th year design projects

All of the equipment will be stored in the Waterloo Space Society Office, which is a locked room in E2. There are no maintenance requirements for the proposal items. All equipment will be available for use by all sub-teams associated with the Waterloo Space Society (ie. Mars Rover Team, Waterloo Rocketry Team and WatSat). Equipment will be shared with other teams where possible.

Estimated Equipment Lifetime

All equipment will be re-used in future models of the space elevator prototype, as the team continues to compete in design competitions. Once the equipment is no longer needed it will be donated back to the University for use by other design teams or for use in undergraduate laboratories.

Cost Breakdown:

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
DC Brushless Motor ()	$550.00	$550.00	$450.00	
High Capcity Rechargeable Battery	$440.00	$440.00	$250.00	
Wireless Microcontroller	$160.00	$60.00	$50.00	
Wireless Data Acquisition Device	$2,540.00	$850.00	$465.00	
Structural Components	$740.00	$740.00	$740.00	
Power System Components	$3,000.00	$1,500.00	$50.00	
TOTAL:	$7,430.00	$4,140.00	$2,005.00	

Implementation Schedule:

UWSTART plans to purchase all equipment with exception to the PV cells (included in the power system components) and certain structural components by the end of this term (August 2010). The PV cells and remaining structural components would be purchased during the fall term. UWSTART hopes to compete with our space elevator climber mechanism in 2011.

Additional Information

This section will be used to describe in more detail what we are actually hoping to build. A future space elevator will consist of a carbon nanotube tether which is attach between the earths surface and a satellite (which acts as the counterweight) in geosynchronous orbit. Then, a mechanical climber will be used to ascend and descend the tether in order to transport payloads into outer space. We will be constructing a prototype of the mechanical climber. To comply with competition requirements, the climber has been designed to have a total mass of less then 50 kg, to ascend a 1 km steel cable and to ascend at a speed of 5 m/s. Keeping in mind that the climber will be powered by a laser beam shot from the earths surface.

Contact Information for funding if different than above:

Name:
E-mail:
Phone Number:
Position:

Title:

UW Intelligent Robot Experiments

Submitted By:

Name: Ammar Alzaydi
Email: aalzaydi@engmail.uwaterloo.ca
Team: UW Intelligent Robotics Experiments Group
Position: UWIRE President
Number of Team Members: 7
Percent of Members in Undergraduate Engineering: 57%

Description of Proposal:

The UW Intelligent Robotics Experiments Group (UWIRE) is a robotics team that differentiates itself from the other robot teams by focusing on cognitive system designs rather than simply creating robotic platforms. To date, the UWIRE group has created and organized the annual RobotRacing tournament between several of Canada's universities to encourage developments in the area of intelligent robotics. The UWIRE group is hoping to explore different areas of intelligent robotics that make use of high-fidelity sensors, so that their research can enter the leading-edge of robotics in hopes of gaining notoriety throughout the robotics community.

Proposal Benefits:

The equipment requested would directly be used by engineering undergraduate students who are apart of the UWIRE team, particularly those in Mechatronics. Many of the undergraduate robotics labs (such as for the MTE 220 course) focus on low-level design with minimal parts to emphasize good engineering practise; the projects these parts would go towards would focus on high-level intelligent design and the full spectrum of possibilities with robotics. Collaboration between the UWIRE group and the other robotics clubs in the past has been of great benefit for all parties, and this tradition would keep up by sharing all equipment with the other robot teams when not in use by UWIRE.

Estimated Equipment Lifetime

All items would be stored in locked offices in E3X, and provided by teachers who assist the team with its various projects. Maintenance would be minimal as there are very few mechanical components; as long as the sensors are stored in a cool, dry place away fro sunlight, there should not be any problems. All items will be used in multiple projects and on multiple platforms, shared across multiple teams. The lifetime for most sensors is estimated to be at least 6 years, although some sensors (oscilloscopes) may become obsolete faster; however, going with Waterloo's tradition of 'doing the most with the least', all sensors are expected to be used for the entire length of their useful operation.

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:

Currently UWIRE is designing an entry for this summers' RobotRacing competition, but is also pursuing research projects for publishing in engineering journals. By next summer, a working prototype robot should be completed using multiple redundant sensors for "Simultaneous Location and Mapping" algorithms, using as many of the sensors requested as possible. By the end of the Winter term, most of these sensors should be interfaced with various platforms so they can readily be used.

Contact Information for funding if different than above:

Name: Ammar Alzaydi
Email: aalzaydi@engmail.uwaterloo.ca
Phone number: 519-888-4567 ext. 37577
Position: UWIRE President

Title:

University of Waterloo Aerial Robotics Group – RC Airplane GLOW / Gas Engine

Submitted By:

Name: Alex Green, Trevor Smouter
E-mail: ahgreen@engmail.uwaterloo.ca, trevors@emrlabs.ca
Phone Number: 519-501-9109, 519-616-3675
Team/Department: WARG / ECE
Position: Club Member
Number of Team Members: 12

Description of Proposal:

The Waterloo Aerial Robotics Group is a team of University of Waterloo students and professors who, with the support of our sponsors, are developing a series of fully autonomous flying robots. Students in the group wish to build an autonomous aerial vehicle, which will compete in a competition with Unmanned Systems Canada. The basic mission for the students will be to operate in support of forest fire fighting personnel. UAVs (Unmanned Aerial Vehicles) will be asked to locate points of interest within a designated area surrounding a forest fire in the remote Canadian wilderness, while UGVs will be required to patrol a fire break to spot any area where the fire might have jumped the break. Our team's plane body has been completed and all that is required is an RC plane engine. This will allow for aerial tests and flight performance tests. This must be completed before the mounting of processing electronics and sensory equipment.

Proposal Benefits:

Completing this project and producing a plane that will compete in this competition provides excellent experience for those involved. The outcome of the competition is completing a plane that tracks forest fires, which is important to the safety of many people in Canada. A successful UAV will help save lives in rural areas where forest fires are a risk. Also, it will bring positive attention to the University of Waterloo and its exceptional progress and development of unmanned aerial vehicles.

Estimated Equipment Lifetime:

The lifetime of a Saito GLOW engine is roughly 12 years

Cost Breakdown:

Engines were selected on the basis of vibration and stability. To allow for effective observation, the platform must be stable and not constantly vibrating from engine operation. Also the engine must be light and of good quality to ensure reliable flight characteristics.

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
RC Aircraft Twin GLOW / Gas /Jet Engine	*$588.99* Saito 60 Twin Glow fuel engine	*$727.99* Saito 128 Twin Dual Plug Engine	*$1199.99* Evolution 116GX2 Gas Engine	*$2695.00* JetCat P20-SE Turbine Engine

				

Implementation Schedule:

The competition date is scheduled for May 2011. We plan on having the plane flying by early July and implementing and testing electronics after flight tests have been completed.

Title:

University Of Waterloo - Midnight Sun Solar Race Team

Submitted By:

Name: Rashid El-Ladki E-mail: relladki@engmail.uwaterloo.ca Phone Number: 519-590-3111
Team/Department: UW Midnight Sun Solar Race Team/Systems Design Engineers
Position: Core Member
Total Number of Team Members: 22 Core Members and approximately 60 Student Volunteers
Percent of Team in Undergraduate Engineering: 90%

Description of Proposal:

The Midnight Sun Solar Race Car Team is the largest student run project at the University of Waterloo. The team consists of students with backgrounds from a variety of faculties and departments within the University, with the vast majority of the team in Engineering. The Midnights Sun is a community friendly team that has actively participated in events that promote energy efficiency, such as visits to high schools and featuring in a documentary on the Discovery Channel. Every two years, the team builds a solar powered vehicle, with the construction of the tenth edition of the Solar Cars to be completed by the end of the present Spring Term.

Proposal Benefits:

Through the Midnight Sun, engineering students at the University of Waterloo have the possibilty to both practice and implement what was taught in class and gain skills external to what is learnt through academia to construct and maintain a Solar Powered vehicle. As this specific proposal is requesting electrical components, its benefit will provide students at the University with the opportunity to learn how the team controls the Battery Pack to maintain safety and produce a voltage from converting energy obtained from the solar panels. The Circuit Boards that will be ordered to build the Battery Protection System will remain in the vehicle throughout the reminder of its life and will only be removed when the team conducts vehicle maintenances or upgrades. The Maximum Power Point Trackers will also remain in the vehicle's Upper Body.

Estimated Equipment Lifetime

The equipment the team would wish to purchase with the assistance of WEEF are the Battery Protection System Circuit Boards and the Maximum Power Point Trackers. Trackers are of particular importance as history has shown that some Trackers may still be used on the next car albeit a decrease in performance. Certain components from the Battery Protection System may be slavaged at the end of the vehicle's life cycle, however with the team's constant desire to improve vehicle standards as well as changes occuring within race regulations the System has consitently been redesigned per vehicle. The team will have a vehicle capable of competing in competitions and fit for engangement at various University, Energy Efficiency Awareness, and Educational events that the team can feasibly take part in.

Cost Breakdown:

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
Battery Protection System Boards	$1,800.00	$1,000.00	$1,000.00	$1,000.00
Maximum Power Point Trackers	$2,500.00	$2,500.00	$1,500.00	$1,000.00
TOTAL:	$4,300.00	$3,500.00	$2,500.00	$2,000.00

Implementation Schedule:

The Midnight Sun Solar Race team has already inquired in obtaining the above listed parts and is actively searching the most suitable deal that will meet the team's standard at a suitable price. As these electrical components are the final parts for the successful completion of the Midnight Sun X, the team will complete their construction and

Title:

University Of Waterloo Alternative Fuels Team - Weef Proposal of Spring 2010.

Submitted By:

Name: Jason Kuo E-mail: Jason.ch.kuo@gmail.com Phone Number: (416) 809-6236
Team/Department: UWAFT Position: Undergraduate Team Member
Total Number of Team Members: 34
Number of Team Members in Undergrad Engineering: 25

Description of Proposal:

The Univeresity of Waterloo Alternative Fuels Team (UWAFT) is participating in the 3 year EcoCAR Challenge. To enrich the learning and understanding of vital components within the advanced hydrogen propulsion system for undergraduate students, the team is proposing additional WEEF investment for necessary safety equipment, tools, and a CAD design station. Investment in these components is necessary to allow UWAFT to compete against other university teams effectively.

Another aspect of the proposal is to prolong the life of the existing UWAFT truck. A service bedliner is requested to protect the truck body. The truck is used to transport the vehicle to outreach events as well as a means of acquireing parts.

Proposal Benefits:

- More CAD tool access for undergraduate students with properitary software and data (NEXUS cannot support the advanced software the team needs to compete successfully, nor can most personal computers).
- Up-to-update computer simulation capacity for calculation intensive tasks.
- Encourage integration of students from other undergraduate engineering disciplines to participate the team.
- Ensure participants' safety, especially given the nature of the vehicle.
- Allow competitiveness of the team among its competitors in the EcoCAR competition.
- Long-term cost reduction (tools to build components instead of buying the components).
- Improve undergraduate engineering students' knowledge of the components of an advanced powertrain vehicle, give practical design experience.
- Prolong team truck's life, which is essential for day-to-day operation of the team.
- Promote UW engineering undergraduate education by enhancing undergraduate resources.

For all of equipment requested, the existing office will be sufficient in terms of security and means of storage. Tools will be maintained by experienced members based on manufacturers' guidelines. Given the nature of UWAFT's continual involvement in competition of advanced vehicle technology, the requested equipment will be applied until the end of the team's life. UWAFT's equipment is available to fourther year design students. Furthermore, undergraduate students who participate the team have regular access to the equipment requested. UWAFT also allows other student teams to access requested tools/equipment with proper training and request.

Estimated Equipment Lifetime:

Item	Intended Life Time	Project End Date	Utilization after end date
Electrical tools	Five years	May, 2011	Extensive, future advanced powertrain competitions involve electrical engineering.
Safety gear	One to three years	May, 2011	Extensive, basic safety gear will be required for building future projects. Certain items can be conditioned to extend service life.

Mechanical tools	Ten years	May, 2011	Regularly used, mechanical tools are essential in the garage for vehicle assembly in competitions.
Truck bedliner	N/A	May, 2011	Protected by life-time warranty.
Design station	Four years	May, 2011	Extensively used on daily basis.

Cost Breakdown:

Item	Option #1	Option #2	Option #3	Option #4
Electrical tools	$1,269	$1,269	$1,269	$1,269
Team truck bedliner	$621	$621	$621	$621
Safety gear	$1,399	$1,399	$1,399	$0
Mechanical tools	$1,160	$1,160	$0	$0
Design station	$4,236	$0	$0	$0
Total	$8,685	$4,449	$3,289	$1,890

Implementation Schedule:

Date	Description
June 19th, 2010	Due date of WEEF proposal.
June 29th, 2010	Presentation on WEEF proposal.
July 31st, 2010	Possible approval for requested items.
August 2nd, 2010	Ordering approved items.
August 6th, 2010	Application of team truck bedliner.
August 9th, 2010	Arrival of soldering station and electrical tools.
August 23rd, 2010	Delivery of computer design station.
September , 2010	Delivery of team trailer.
May, 2011	Participation for EcoCAR challenge.

Additional Information:

The requested funds represent only a fraction of the team's needs to be competitive in EcoCAR and future Advanced Vehicle Technology Competitions. Having just returned from the Year 2 competition finals, the team understands that it is far behind many other universities in resources dedicated to the EcoCAR program. UWAFT hopes that WEEF is able to make contributions that will help change this situation and support the team in pursuing a winning vehicle for the third and final year of EcoCAR. The skills and knowledge that undergraduate students will develop in this regard make them invaluable hires for automotive companies in a wide range of activities.

Contact Information for funding if different than above:

Name: Michael Giannikouris *E-mail: mgiannikouris@gmail.com*
Position: Team Leader *Phone Number: (519) 888-4567 ext 36208*

Title:

University Of Waterloo Formula Motorsports (Formula Sae) Team Weef Proposal

Submitted By:

Name: Peter Chan E-mail: uwfsae@gmail.com Phone Number: x35904
Team/Department: Formula SAE Position: Business Group Leader
Total Number of Team Members: 50+
Percent of Team in Undergraduate Engineering: 95%

Description of Proposal:

Four items are included in this proposal which would provide immediate benefit to the team during the summer testing and development season. These items will be used to further develop the car through the ME481 projects as well as to provide opportunities to drive for every member of the team.

1. Engine Control Unit (ECU) is needed to for planned engine development as well as a backup unit.
2. Helmets are necessary safety equipment for planning testing.
3. Small Cones used for testing and driver training in the parking lots to outline the test track.
4. Data Acquisition Sensors for planned development of the car.

Proposal Benefits:

The FormulaSAE team is Waterloo's largest undergraduate engineering team on campus, and participates in the largest undergraduate engineering competition in the world. The requested items will allow our team to teach more than 100 first and second year students about automotive technology, with a focus on hands on learning. Furthermore the FSAE team and its supporters like WEEF receive exposure at numerous events such as the Toronto International Auto Show and Molson Indy 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. These items have no maintenance requirements during their expected lifetimes. These items will provide direct benefit to students in ME481 and ME481 in the current and future terms as well as provide an ancilliary benefit to all students exposed to the car..

Estimated Equipment Lifetime

1. The ECU is expected to be used for 6+ years as the previous one has lasted for 5 years already.
2. The Helmets are expected to be used for 5+ years.
3. The Testing Cones are used by the team continuously for three or more years.
4. Data Acquisition Sensors will last the team three years.

All of these items will be used beyond this immediate season.

Cost Breakdown:

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
ECU	$1,500.00	$1,500.00	$1,500.00	$1,500.00
Helmets	$650.00	$650.00	$650.00	
Small Cones	$400.00	$400.00		
Data Acquisition Sensors	$500.00			
TOTAL:	$3,050.00	$2,550.00	$2,150.00	$1,500.00

Implementation Schedule:

All items purchased would be used immediately by the entire team. Testing has begun already and will continue through to the end of October.

Additional Information

Please take into consideration our very large team when deciding on the amount of funding that we will receive. We also employ 2-3 volunteer co-op students each term, providing them with extensive hands-on skills and automotive design experience. We struggle to cover all of our expenses with so many undergraduate students to support!

Contact Information for funding if different than above:

Name: Peter Chan
E-mail: uwfsae@gmail.com
Phone Number: x35904
Position: Business Group Leader

Title:

The 2010 International Genetically Engineered Machines (Igem) Team Request For Support.

Submitted By:

Name: Matthew Gingerich E-mail: matt@majugi.com Phone Number:
Team/Department: iGEM Team, Systems Design Engineering Student Position: iGEM Team Leader
Total Number of Team Members: 40
Percent of Team in Undergraduate Engineering: 32.5% (from systems design engineering, chemical, electrical and computer, and nanotechnology)

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). Current work includes producing a synthetic biology platform for chromosome engineering as well as a diagnostic tool for pathogens based on a two-component regulatory system. An important tool for laboratory implementation of these devices is a centrifuge, ours requires a new sealing ring from ThermoScientific in order for the device to remain a useful tool for educating and training undergraduates.

Proposal Benefits:

Waterloo's participation in the iGEM competition will benefit both the engineering students involved and the University itself. For students, iGEM is an excellent opportunity to apply what they have learned as undergraduates in a real-life research setting. Working on the iGEM team also develops valuable design, research and teamwork skills not easily taught in the classroom. Furthermore, participants will have the opportunity to attend the iGEM jamboree, a conference at MIT where all iGEM teams from around the world (approximately 150 teams) will present their projects. This will give undergraduates as well as the University a high degree of exposure to a cutting-edge international academic community, members of industry, as well as the media. The iGEM team is hosted in the Charles lab. The centrifuge is housed there and is used daily for labwork relevant to the iGEM competition. The lab equipment serves to educate engineering students about important techniques for engineering biological systems, many of which are not taught in the classroom.

Estimated Equipment Lifetime

The iGEM team works year round in the lab and the centrifuge is a central element to this lab work. The sealing ring being requested has an expected lifetime as long as the life of th centrifuge which is estimated to be another 5-10 years.

Cost Breakdown:

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
Gasket Sealing Ring	$157.75	$105.16	$78.87	
TOTAL:	$157.75	$105.16	$78.87	

Implementation Schedule:

Access to laboratory space has been secured, and the lab implementation of both our 2009 and 2010 projects is well underway. Our centrifuge is currently operable but without a replacement sealing ring we risk significant damge to our centrifuge as well as major set backs to our progress. The sealing ring would be used immediatley and for many years to come.

Additional Information

Contact Information for funding if different than above:

Name: Leah Kocsis
E-mail: leah.kocsis@gmail.com
Phone Number: 905 650 3466
Position: Team Member

Title:

University of Waterloo Micro-Aerial Vehicle teams request for resource funding from WEEF

Submitted By:

Name: Prasenjit Mukherjee
E-mail: pmukherj@engmail.uwaterloo.ca
Phone Number: 905-997-4446
Team/Department: University of Waterloo Micro-Aerial team
Position: Competition Director
Total Number of Team Members: 10-20
Number of Team Members in Undergrad Engineering: 90%

Description of Proposal:

The UWMAV team seeks to develop prototypes of automated fixed winged, flapping winged and rotory winged aerial vehicles to compete in various international competitions (IMAV, IARC). In the past, various teams of mechanical and mechatronics engineering students have worked on building the micro-mechanical aircraft in an effort to create steady and durable vehicles for MAV flight. We have also developed a versatile autopilot platform for our different aerial systems. Thanks to support from WEEF, the autopilot design was awarded the best technical project at the Mechatronics Symposium and featured at the Designing the Future Event in Waterloo. The funding requested in this proposal will be used to continue this work and further develop, upgrade and integrate the autopilot with our various platforms. The funding will be used to upgrade and prototype a new autopilot system (including better avionics parts and ground station equipment). A portion of the funds will also be used to obtain miscellaneous interfacing and electrical equipment as well as laboratory infrastructure such as monitors and wireless systems required to develop and test the aircraft. This new hardware will be especially employed when UWMAV moves to its allotted space in the Engineering 5 Student Design Centre and is able to support the activities of more students.

Proposal Benefits:

The University of Waterloo Engineering framework does not include an official aerospace or aeronautical engineering program. The typical coursework of such a program can be found in the MME, ECE and SYDE programs, however there is no framework for practical and academic experiences geared primarily to an aeronautical application. Clubs like the UWMAV club intend to fill this void by providing a framework where students can gain practical knowledge and experience in this field. The equipment in this proposal will be used to design, upgrade and support aerial platforms and systems that will expose the undergraduate students involved to important skills and cutting-edge research.

Estimated Equipment Lifetime:

Autopilots: These are versatile systems and contain the latest hardware as of this year. These systems can be used on multiple mechanical platforms for more than 5-10 years.
Laptop/ Routers: These are systems needed for the proper functioning of the ground equipment and will stay within the team for the foreseeable future.

Cost Breakdown:

Item		Option #1 ($)	Option #2 ($)	Option #3 ($)
Autopilot Design Prototype (2x)	IMU	800	1000	1500
	GPS	400	800	800
	Sonar Systems	100	200	200
	Processor	500	1000	1000
	MCU	40	100	100
PCB Prototype/Assembly		500	500	800
GPS Basestation Equipment		0	400	400
Laptop (Ground Station)		700	900	1000
Router (Misc Electronics)		100	200	300
		3140	**5100**	**6100**

Implementation Schedule:

The autopilot systems will be constructed through the summer. These systems can then be used on the new platforms built over the fall of 2010.

Title:

Clean Snowmobile Team Spring 2010 WEEF Proposal

Submitted By:

Name: William A. Espie E-mail: waespie@engmail.uwaterloo.ca Phone Number: (519) 616-0562
Team/Department: Clean Snowmobile Team Position: Student Member
Total Number of Team Members: 20+ (expected to grow in F10)
Number of Team Members in Undergrad Engineering: All members are Undergraduate Students

Description of Proposal:

The UW Clean Snowmobile Team is preparing for the annual SAE Clean Snowmobile Challenge, to be held in Houghton Michigan in March, 2011. The focus of the 2011 competition is on improving fuel efficiency, and the project snowmobile currently being designed and built by the UW team does just that. In order to seriously compete at the competition, we do require some key materials to maintain our energy efficient status. We are interested in: an auxiliary fuel and ignition system (which mounts between the engine's ECU and the fuel and ignition systems) to allow the engine to safely and effectively run the ethanol based fuel supplied at competition; a drop-resistant, weatherproof laptop to facilitate testing/tuning out of doors; a new instrument panel compatible with our current engine and its stock controller; and, finally, a set of upgrades for the team's dynamometer (servo throttle and load control, and the wiring harness required to implement them).

Proposal Benefits:

These materials would provide substantial, lasting benefits to the to the students on the clean snowmobile team. All four components are an essential part to the snowmobile team, which is a team run completely by undergraduate students. The dynamometer materials will facilitate more accurate and repeatable testing of our engines. The laptop will allow us to log data while testing outside and to make modifications to fuel and spark maps in the field. Finally, the instrument panel and the fuel/ignition controller are probably of the most importance to successfully completing our vehicle for competition. Without the controller, we would be unable to run the 20-29% ethanol fuels provided at the competition. The Arctic Cat instrument panel would eliminate the vast majority of wire harness splicing required to integrate our engine's electrical system into that of our chassis and will drastically reduce the potential for electrical problems in the vehicle.

All team materials are stored within the team's garage, which is accessible only to team members and university maintenance staff. Upon the retirement of the snowmobile in which the controller and instrument panel will be installed, it will likely replace our previous snowmobile as a driver training/chase vehicle (a potential lifespan of 9 years). There is no foreseen end to the utility of either the dynamometer equipment of the laptop. Maintenance is a concern only for the dynamometer servo load valve which will require periodic lubrication and re-taping of fittings, both of which will be performed by team members.

Use of all of the aforementioned equipment, with the exception of the dynamometer equipment, will be limited to the members of the Clean Snowmobile Team. The dynamometer equipment will be available by request to other student teams that require its use.

Estimated Equipment Lifetime:

The fuel controller and the gauge unit will be in use for, at the very least, four years in which we will be competing using our current Ski-Doo/Arctic Cat platform. It is quite likely that the snowmobile in which they will be installed will continue to be used by the team for driver training and as a “chase” vehicle long past the end of its competition life.

The dynamometer upgrades are expected to last indefinitely. The team will always have need of the testing and data-collection opportunities they will provide. The laptop is also expected to last a very long time – its rugged construction ensures that its life cycle will be determined by obsolescence (not less than five years), rather than by mechanical or electrical failure.

Cost Breakdown:

Item	*Option #1*	*Option #2*	*Option #3*
1.PowerCommander fuel controller with LCD display, wideband sensor, and ignition module	$1,900.00	$1,900.00	$1,900.00
2. Dynamometer Upgrades	$3,900.00	$0.00	$0.00
3. Arctic Cat T660 gauge unit	$650.00	$650.00	$650.00
4. Panasonic Toughbook CF19 Laptop Computer	$4,500.00	$4,500.00	$0.00
TOTAL:	$10,950.00	$7,050.00	$2,550.00

Implementation Schedule:

All materials will be implemented and used in the 2011 Competition in March. There is immediate need of the dynamometer upgrades, as testing is currently in progress. Therefore they would be purchased promptly and be implemented upon arrival. The laptop would also see immediate use in conjunction with the dynamometer and would be in use year-round.

Additional Information:

Insert any additional information here.

Contact Information for funding if different than above:

Name: Dr. Peter Teertstra
Position: Faculty Advisor to team
E-mail: pmteerts@uwaterloo.ca
Phone Number: (519) 888-4567 x35610

Title:

Iron Warrior Needs A New Video Card!

Submitted By:

Name: Angelo Alaimo E-mail: iwarrior@engmail.uwaterloo.ca Phone Number: 519-888-4567 x32693
Team/Department: The Iron Warrior Position: Editor-in-Chief
Total Number of Team Members: 30+
Percent of Team in Undergraduate Engineering: 100%

Description of Proposal:

The video card slot and video card on our motherboard on one of our WEEF purchased computers which is primarily used for layout of the newspaper stopped working two weeks. Since the video card has stopped working, we are unable to use the dual-monitor setup necessary for layout. We have swtiched to the on-board graphics for the time being, but layout is almost impossible as the computer responds very slowly while using our layout software (Adobe Indesign CS4).

Our proposal is to replace the non-functional video card and motherboard in our older computer with a new one which is compatible with all current components.

Proposal Benefits:

The Iron Warrior is open to any student in undergraduate engineering, as well faculty, alumni, and staff who can make contributions. The immediate benefit from getting a new video card and motherboard is that we will be able to resume efficiently producing the newspaper on our dual-screen setup. The second benefit is increased computer performance which will expedite layout of the newspaper.

This computer is used not only by The Iron Warrior to produce the newspaper but also is used to create the TSN video summarizing all the Enginering Society events happening during the term.

Estimated Equipment Lifetime

Since the computer is already two years old, we expect the lifetime of the equipment to last at least 3 more years. The current processor and memory of the computer are sufficient to last well into 2013. Looking on further down the road, the video card in option we plan to get will make use of newer software which can utilize Graphics Processing Unit acceleration, so even if this computer only last 3-4 more years, the video card in option 1will be able to be transferred if necessary. The Video Card in option 2 is not as high spec'd as the one in option 1 so we expect the video card in option 2 to last the remaining life of the computer.

Cost Breakdown:

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
Motherboard - Gigabyte MA785GM-US2H	$96.00	$96.00		
Video Card - Option# 1	$146.00			
Video Card - Option# 2		$84.70		
TOTAL:	$242.00	$180.70		

Implementation Schedule:

If funding is approved, the items would be in place for Issue 5 Production weekend happening July 17-18

Title:

Waterloo Rocketry Team - Rocket Team Supplies

Submitted By:

Name: Ali Karimi E-mail: wrt@engmail.uwaterloo.ca Phone Number: 519-496-6826
Team/Department: Waterloo Rocketry Team/ Mechanical Engineering
Position: Structures/Aerodynamics Lead
Total Number of Team Members: 25
Number of Students in Undergraduate Engineering: 21

Description of Proposal:

The "Waterloo Rocketry Team - Rocket Team Supplies" proposal is a fundamental donation to the Waterloo Rocketry Team. The Waterloo Rocketry Team will enter a team into the 2011 Intercollegiate Rocket Engineering Competition (IREC) held by Experimental Sounding Rocket Association (ESRA). The IREC will be in its 6th year, and university students enter the competition by designing and building a reusable sounding rocket. This proposal requests funding to support acquisition of control equipment for the rocket, sensors, servos and equipment, electronic power circuit boards, mechanical parts and batteries etc.

Proposal Benefits:

Benefits for UW engineering faculty/ students:

1) UW engineering exposure in rocketry, 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 annually.

4) Students will gain a wide spectrum of valuable learning and design experience/skills: problem solving, engineering researching (physics, chemistry, control systems, aerodynamics, etc), software modelling, simulation, electronic and mechanical design/manufacturring/assembly, components implementation and integration, and system debugging.

5) Designing for high atmosphere applications, an area UW does not currently do a lot of work in

6) Team environment skills: team participation, leadership, mentorship, financial planning (sponsorship, costing, negotiating prices)

Measures are taken to guarantee full university insurance for the team and its activities. Also, the UW safety office is informed about the team and all safety procussions are taken. The team is currently using the space available to the WARG on loan and joint partnership on the payload project for storage. The UW space society and all their subteams (marsrover, watsat, etc) will have access to the equipments also any other group or individual who is interested to take on a project with us.

Estimated Equipment Lifetime

Since the team is planning to continue and build at least one rocket each year, all the equipment used for the 2011 project will be used for future projects except the actual structures of the rocket which is different based on the rocket design. All other equipment and custom built structures such as the engine test stand and launch pad will be used in future projects.

Cost Breakdown:

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
Rocket Mechanical and Structural Parts	$1,450.00	$1,000.00	$900.00	
Engine test stand structural parts	$400.00	$350.00	$300.00	
Engine test stand sensors/electronics	$300.00	$250.00	$300.00	
Test Rocket Motors and structure	$400.00	$300.00	$250.00	
Rogallo wing glider components, eg servos	$1,000.00	$800.00	$600.00	
Test oxidizer tank and fuels	$400.00	$300.00	$250.00	
TOTAL:	$3,950.00	$3,000.00	$2,500.00	

Implementation Schedule:

Summer 2010: Design and initial testing stage: start the development of the control system, a propulsion system and the general design of the rocket, begin preliminary testing/debugging.

Fall 2010: Finalize a design, and continue with fabrication, testing and debugging the rocket parts. Develop the technical documents required for the competiton.

Winter 2010: Perfom the final testings and build spare parts. Complete rocket build and ensure competiton readiness

Additional Information

The IREC takes place in Green River, Utah. In 2009, five American Schools entered into the competion. 2011 is set to be the first year where schools from other countries will compete. So far Waterloo and École Polytechnique de Montréal have expressed interest in competing in 2011. The competition is funded by major companies in the space exploration and utilization field. This is the most publicized university-level sounding rocket competion of its kind in North America.

WRT launched its first rocket on Saturday June 19th, the rocket was called UW WEEF!

Title:

Robotics Team Proposal S10

Submitted By:

Name: Trevor Jenkins E-mail: tekjenki@engmail Phone Number: 519-998-0161
Team/Department: UW Robotics Team Position: Sponsorship Manager
Total Number of Team Members: 40
Number of Team Members in Undergrad Engineering: 100%

Description of Proposal:

The UW Robotics Team is constantly striving to remain at the forefront of robotic trends and demonstrate member's innovation at competitions across North America. This proposal is for various parts and components that will be used on various robots, including the team's entries in IGVC, Sailbot and TronMower. The LIDAR is basically what allows the robot to "see" and remain autonomous, which is a critical component of all our robots. The majority of the other components are used extensively in projects, and will replace either wearing out equipment (Router, HigLevel Computer, drill, dremmels), or replace an impractical form of technology with its modern equvalent (SSHD). Finally, the Mini-Sumo material would fund hardware for the event.

Proposal Benefits:

The UW Robotics Team has at least 40 active members from all years. The robotics team is constantly seeking out new projects and new members, and places a large emphasis on getting inexperienced students involved with technical projects. On top of the mini sumo competition which sees students with no prior experience build fully autonomous robots, we have run and plan to continue running technical tutorials on subjects students won't see in class. The equipment would allow us to remain competitive and ensure that our ongoing projects can remain competitive and have the necessary resources to succeed.

Estimated Equipment Lifetime:

All material listed will be reused for years to come. The majority of the requested equipment is replacing material originally purchases by WEEF over 5 years ago, with near constant usage. The materials are are captial expenditures and will remain with the team for the indefinite future.

Cost Breakdown:

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

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
LIDAR (LMS111-101000) (Partial Funding)	$3,400.00	$2,800.00	$2,300.00	$2,000.00
Mini-Sumo Prototpying Material	$500.00	$500.00	$300.00	$300.00
Solid State Hard Drive (64GB)	$189.99	$189.99	$189.99	$189.99
High Level Computer (Mini ITX Mainboard)	$184.00	$184.00	$184.00	$184.00
New Router (Linksys Wireless-G)	$78.00	$78.00	$78.00	$78.00
Dremmels + Drill	$250.00	$250.00	$0.00	$0.00
TOTAL:	$4,601.99	$4,001.99	$3,051.99	$2,751.99

Implementation Schedule:

The materials will start to be acquired once funding has been acquired. All are key operational components and are needed for continued team success.

Title:

Entry To The Innaugural Canadian Satellite Design Challenge

Submitted By:

Name: Stefan De Young E-mail: stefandeyoung@gmail.com Phone Number: 226-868-3767
Team/Department: WatSat (Satellite Design Team) Position: Team Lead
Total Number of Team Members: 8
Number of Team Members in Undergrad Engineering: 75%

Description of Proposal:

This proposal represents an initial funding request towards the creation of a student space lab at the University of Waterloo, primarily in support of WatSat's first entry into the Canadian Satellite Design Challenge which runs from Fall 2010- Spring 2012. Whilst this is the inaugural Challenge it has attracted substantial interest from universities and corporate sponsors across Canada including industry giants such as ComDev. The basis of the challenge is to construct a microsatellite, the winning teams satellite will be launched into low Earth orbit. We are asking for donations to purchase essential lab equipment for the space engineering lab. The lab will also be used by other engineering teams including the Mars Rover and UW Rocketry.

Proposal Benefits:

1) This lab will give students the opportunity to design and build space-worthy hardware. This opportunity is not readily available elsewhere.

2) The WatSat project will provide a stepping stone for undergraduate students who wish to pursue higher education in aerospace engineering.

3) The WatSat project will partner with private aerospace companies, which may provide job opportunities for team members.

4) The equipment will be stored in a room on campus at the University of Waterloo. The equipment could be stored at the Waterloo Space Society office in E2 pending the allocation of lab space from the faculty of Engineering.

5) The equipment will likely be used in support of multiple space-related projects including those of the Mars Rover Team, UWStart (Space Elevator Team), and UWRocketry.

6) The competition will likely run more times, so the equipment will be extensively used.

Estimated Equipment Lifetime:

1) Oscilloscope - (lifetime indefinite)
2) Desktop Computer for CAD and communications testing - (expected useful lifetime 5 years)
2) Digital Multimeter - (lifetime indefinite)
3) Electronics test bed equipment: eg. breadboards, components, ICs - (expected to last until May 2012)

Cost Breakdown:

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
Oscilloscope	$1,300.00	$1,000.00	$1,000.00	$1,000.00
Desktop Computer	$1,000.00	$500.00	$500.00	$500.00
Digital Multimeter	$750.00	$500.00	$0.00	$0.00
Electronics Components	$500.00	$250.00	$250.00	$0.00
Software (Signal Analysis, Solidwoks etc.)	$500.00	$300.00	$200.00	$150.00
	$0.00	$0.00	$0.00	$0.00
TOTAL:	$4,050.00	$2,550.00	$1,950.00	$1,650.00

Implementation Schedule:

Design Begins - September 2010
Lab Space Obtained - October 2010
Lab Equipment Purchased - November 2010
Construction Begins - February 2011
Preliminary Design Review - May 2011
Critical Desgin Review - September 2011
Environmental Testing - May 2012

Additional Information:

WatSat may be partnering with another team where one team would provide the payload and the other the bus for the satellite. WatSat has not yet decided whether or not to pursue such a partnership. The equipment requested in this proposal will be useful regardless of whether our project is the bus, the payload, or both.

Our primary recruitment campaign will begin in the fall. Based on interest observed, we expect to have a dedicated team of at least 20, with a likely turnout of at 75% engineering students.

Title:

Waterloo Off-Road Mini Baja Team (Wombat) Weef Proposal

Submitted By:

Name: Christopher Miller
E-mail: c2miller@engmail.uwaterloo.ca Phone Number: 519 716 0013
Team/Department: Wombat Position: Team Member
Total Number of Team Members: 25
Number of Team Members in Undergrad Engineering: 100%

Description of Proposal:

Based on performance at the 2010 competition (the team's best ever) there are a number of areas for optomization. In particular, 2010 was the first year requiring a flotation system. The car spends a suprising amount of time in the water during the endurance race.

Also, a number of components are drawn from ATVs around 2003-2004 model year. Obtaining parts such as steering racks, wheel hubs, ball joints or brake calipers early is key, since Polaris, a key supplier, does not release drawings which requires extensive analysis and fit-up.

Other materials are required such as frame tubing (and welding service), safety gaurding, hand tools. personal safety equipment and testing gauges.

Proposal Benefits:

This proposal will benefit undergraduate engineering by allowing students to get realistic hands on experience. In particular, it will afford opportunities to learn specific skills desired by the automotive industry, as well as teamwork and team management. Also, many opportunities are available for challenging and rewarding design projects - around 15 per year. All equipment will be securely locked in the team's cage in the fluids lab. All of the tools and supplies are regularly shared between student teams.

Estimated Equipment Lifetime:

Components can be expected to be used for the lifetime of the vehicle, which is two years competitively followed by several years of training useage. However, due to the rough enviornment, components will periodically need to be replaced, at the rate of 1-2 per term. The current design is reasonably modular, so most components such as hubs, calipers, etc. can be re-used on future cars.

Cost Breakdown:

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

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
Flotation (foam, angle iron)	$100.00	$100.00	$100.00	$100.00
Frame tubing	$1,000.00	$1,000.00	$0.00	$0.00
Upgraded components	$2,000.00	$0.00	$2,000.00	$0.00
Replace worn safety equipment	$300.00	$0.00	$0.00	$300.00
	$0.00	$0.00	$0.00	$0.00
	$0.00	$0.00	$0.00	$0.00
TOTAL:	$3,400.00	$1,100.00	$2,100.00	$ 400.00

Implementation Schedule:

Materials and components will be ordered ASAP. The majority of the build phase will take place in Fall 2010, and testing will be completed in Winter 2011 ahead of the 2011 SAE Baja competition in Spring 2011.

Title:

UW ASIC Team - AllSparc Project FPGA Development Boards

Submitted By:

Name: Kartik Vamaraju E-mail: kvamaraj@uwaterloo.ca Phone Number: 226.747.5720
Team/Department: UW ASIC – AllSparc Project / ECE Department Position: Team Member
Total Number of Team Members: 30
Number of Team Members in Undergraduate Engineering: 30 (100% in Engineering)

Description of Proposal:

The AllSparc project within the UW ASIC Team is seeking support for the acquisition of three Xilinx Virtex-5 based FPGA development boards for leading-edge undergraduate research into RISC processor architecture.

Proposal Benefits:

As part of the AllSparc project, the Xilinx Virtex-5 FPGA development boards will be used to implement design variations of the OpenSparc RISC processor for improved performance and functionality. This project will offer an unprecedented opportunity for undergraduate students to see first hand the workings of a leading-edge processor, and participate in its continued development. Moreover, AllSparc presents a unique environment in which students can experiment to improve not only the hardware design but also the operating system threading routines that will run on the CPU itself. The project will:

- Provide exposure at the undergraduate level to Masters/PhD level research in CPU architecture
- Give students a chance to contribute to a challenging hardware design
- Provide an opportunity to learn Verilog
- Build solid qualifications for real world digital design co-op jobs
- Facilitate research into multiple simultaneous threads of execution at the operating system and application software level.

After the duration of the AllSparc project, the Xilinx Virtex-5 FPGA development boards will continue to be used for future UW ASIC Team projects.

Estimated Equipment Lifetime:

The Virtex-5 OpenSPARC Evaluation Platform is expected to be used for approximately 5 years.

Cost Breakdown:

Item	Option #1	Option #2	Option #3
Virtex-5 OpenSPARC Evaluation Platform	3 x $750.00	2 x $750.00	1 x $750.00
Total Costs (not including currency conversion, taxes and shipping/handling)	$2,250.00 USD + taxes +shipping	$1,500.00 USD + taxes +shipping	$750.00 USD + taxes +shipping

The Virtex-5 OpenSPARC Evaluation Platform includes both the Xilinx Virtex-5 FPGA development board, as well as a power supply and necessary hardware adaptors. The required development software from Xilinx is not included, but will be obtained through the Xilinx University Program.

*Please note that the cost stipulated above is the academic price. The regular price is about $2000 USD per unit.

Implementation Schedule:

The planning and organization for the AllSparc began on May 2010, and the first team meeting was on June 3rd. Currently work is being done to review the OpenSPARC T1 architecture and to develop support for Verilog. Hardware design work with the AllSparc project will begin once the development platform is purchased.

Additional Information:

This proposal was prepared with advice and suggestions from:

Name: Sanjay Singh
Position: ECE Lab Instructor
E-mail: ssingh@swen.uwaterloo.ca
Phone Number: x36165

Title:

Computers For Weef Laboratory

Submitted By:

Name: Ajoy Opal E-mail: aopal@uwaterloo.ca Phone Number: Ext. 35302
Team/Department: Engineering Undergraduate Office Position: Director, First Year Engineering
Room/Building Location of Equipment: E2-1310 (WEEF Lab.)
Approximate Number of Undergrad Use: Approximately 1200 first year undergraduate students per year
Engineering Undergrad Courses: ME 100, MTE 100, MSCI 100, ENVE 100, SYDE 161, ECE 126, SE 101, GENE 123, ME 123, MTE 120, ECE 140, ECE 155, ME 201, GENE 119

Description of Proposal:

Currently the 102 desktop computers in the WEEF Lab. are more than 5 years old and their performance is poor. The displays attached to the computers are roughly 1/3 LCD (approx. 5 years old) and rougly 2/3 are older CRT displays (more than 5 years old). This proposal is meant to replace all 102 computers and displays in the lab. with upto date desktop computers and displays. The equipment will be maintained by Engineering Computing.

Proposal Benefits:

Computers are being used more and more frequently in various engineering courses; examples include teaching engineering material (e.g. Autocad, programming courses), use in computer delivered tutorials (e.g. GENE 123, ME 123, MTE 120, ECE 140) and for general purpose computing (e.g. email, word processing, internet access). Having upto date computing facilities is essential for undergraduate education. The computers will be housed in a secure location (E2-1310) which is open during normal university hours and is locked outside normal university hours. The room also has an alarm system that only the designated staff and employees have access codes to operate. The room is used primarily as a teaching laboratory for first year engineering undergraduate students, however, other students and campus groups may use the facilities from time to time.

Estimated Equipment Lifetime:

It is estimated that the new computers and displays will have a lifetime of five years and then replaced after that time.

Cost Breakdown:

Including taxes and volume discounts, each desktop computer costs approximately $750 and LCD display $250. The funding options that can be considered include various numbers of computers and LCD displays to be replaced, the following table gives a small sampling of the possible options.

The Faculty of Engineering will provide $51,000 towards this proposal, it represents half the total cost of replacing all 102 computers and displays. The amount that we are requesting from WEEF funds represents the total cost of the equipment for that option minus the $51,000 provided by the Faculty of Engineering. Extending the proposal over multiple terms by replacing only part of the computers and displays in one term will also be considered.

Item	*Option #1*	*Option #2*	*Option #3*	*Option #4*
102 desktop computers and LCD displays	$51,000.00	$0.00	$0.00	$0.00
102 desktop computers (no display)	$0.00	$25,500.00	$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:	$51,000.00	$25,500.00	$ 0.00	$ 0.00

Implementation Schedule:

The planned implementation schedule is to install all 102 computers and displays before the Fall 2010 term, in the month of August, 2010. If the funding is not sufficient to replace all 102 computers and displays at once, then a phased implementation plan for the next academic year (September 2010 - April 2011) will be considered.

Additional Information:

None.

Contact Information for funding if different than above:

Name: Ajoy Opal E-mail: aopal@uwaterloo.ca
Position: Director, First Year Engineering Phone Number: Ext. 35302