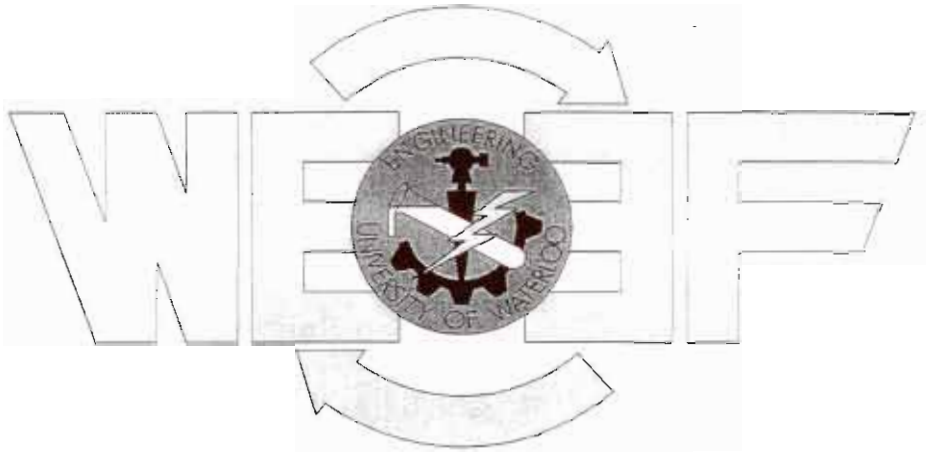
WEEF Proposals & Allocations	Summer 1999	
Chemical	Requested	Allocated
Heat Exchanger Training Equipment	$ 14,744.00	$ 10,000.00
Superpro Designer Software for Enviro/Biochem Engineering	$ 1,750.00	$ -
Upgrading of Computers and Instrument in ChE 032 and EnvE 331 Labs	$ 7,365.00	$ -
Upgrades for Chemical Computer Labs	$ 8,000.00	$ -
		$ 10,000.00
Civil		
Computer Projector	$ 8,200.00	$ -
Hewlett-Packard GC Software	$ 1,370.00	$ 1,370.00
Notebook Computer	$ 7,300.00	$ -
Portable D.O. Meter and Probe	$ 1,800.00	$ 1,260.00
Water Level Meters	$ 2,132.00	$ 1,493.00
Workstation and Printer	$ 3,085.00	$ 1,500.00
		$ 5,623.00
Electrical and Computer		
E&CE 222 & E&CE 354 Coldfire Computer Expansion	$ 10,125.00	$ 1,350.00
E&CE 324 Digital Lab Upgrade to Altera CPLDs	$ 14,000.00	$ 3,000.00
E&CE Unix Room Chairs	$ 2,880.00	$ -
Labview Training Computer	$ 15,226.00	$ -
E&CE 427 Polaris Computer Upgrade	$ 3,150.00	$ -
Printer Circuit Board Milling Unit	$ 20,304.00	$ 10,000.00
		$ 14,350.00
Mechanical		
Fuel Cell Demonstration Project	$ 14,653.00	$ -
Metallographic Sample Preparation System	$ 7,250.00	$ 3,500.00
Versastat Potentiostat/Galvanostat	$ 9,850.00	$ -
Mechanical Engineering E1-2536 Network Upgrade	$ 2,840.00	$ 3,500.00
Monitor Replacement in Mechanical Engineering Polaris Lab	$ 5,184.00	$ 432.00
		$ 7,432.00
Systems Design		
Proposal for Purchase of an EPS1024 Plus Projector	$ 4,500.00	$ 3,800.00
Visio Software Licenses	$ 2,250.00	$ 1,500.00
		$ 5,300.00
Misc		
Engineering Society Digital Services	$ 3,105.00	$ -
Faculty Email Server Appliance	$ 5,000.00	$ 2,500.00
Undergraduate Electronics Shop	$ 8,000.00	$ 3,400.00
Mechanical/Civil Engineering 4th Year CAD Design Lab Network Upgrade	$ 2,760.00	$ 1,380.00
Tooling for Student Shop	$ 1,986.00	$ 1,986.00
Memory Upgrades for Engineering Computing Labs	$ 4,904.00	$ -
		$ 9,266.00
Sub-Total Department	**$ 193,713.00**	**$ 51,971.00**
Student Groups		
University of Waterloo Alternative Fuels Team (UWAFT)	$ 1,530.00	$ 1,000.00
Team Advancement for the Formula SAE Project	$ 5,447.00	$ 2,400.00
GNCTR 2000 Team	$ 2,689.00	$ 2,000.00
Midnight Sun VI Solar Car Project	$ 5,000.00	$ 3,000.00
University of Waterloo Aerial Robotics Group	$ 7,900.00	$ 3,000.00
Clean Snowmobile Challenge	$ 1,500.00	$ 1,500.00
New Macintosh for the Iron Warrior	$ 8,428.00	$ -
Sub-total Student Groups	**$ 32,494.00**	**$ 12,900.00**
Total	**$ 226,207.00**	**$ 64,871.00**



Spring 1999 Proposals

WEEF Proposals - Summer 1999

	CHEMICAL	
1	HEAT EXCHANGER TRAINING EQUIPMENT	~~$14,744~~
2	SUPERPRO DESIGNER SOFTWARE FOR ENVIRO / BIOCHEM ENGINEERING	~~$15,800~~
3	UPGRADING OF COMPUTERS AND INSTRUMENT IN CHE 032 AND ENVE 331 LABS	~~$7,365~~
4	UPGRADES FOR CHEMICAL COMPUTER LABS	~~$8,000~~
	CIVIL	
5	COMPUTER PROJECTOR	~~$8,200~~
6	HEWLETT-PACKARD GC SOFTWARE	$1,370
7	NOTEBOOK COMPUTER	~~$7,300~~
8	PORTABLE D.O. METER AND PROBE	$1,800
9	WATER LEVEL METERS	$2,132
10	WORKSTATION AND PRINTER	$3,085
	ELECTRICAL AND COMPUTER	
11	E&CE 222 & E&CE 354 COLDFIRE COMPUTER EXPANSION	$10,125
12	E&CE 324 DIGITAL LAB UPGRADE TO ALTERA CPLDS	~~$14,000~~
13	E & C E UNIX ROOM CHAIRS	~~$2,000~~
14	FACULTY EMAIL SERVER APPLIANCE	$5,000
15	LABVIEW TRAINING COMPUTER	$15,226
16	E&CE 427 POLARIS COMPUTER UPGRADE	~~$3,150~~
	MECHANICAL	
17	FUEL CELL DEMONSTRATION PROJECT	$14,653
18	METALLOGRAPHIC SAMPLE PREPARATION SYSTEM	$7,250
19	VERSASTAT POTENTIOSTAT/GALVANOSTAT	$9,850
20	MECHANICAL ENGINEERING E1-2536 NETWORK UPGRADE	~~$2,840~~
21	MONITOR REPLACEMENT IN MECHANICAL ENGINEERING POLARIS LAB	~~$5,184~~
	SYSTEMS DESIGN	
22	PROPOSAL FOR PURCHASE OF AN EPS1024 PLUS PROJECTOR	~~$4,500~~
23	VISIO SOFTWARE LICENSES (10)	~~$2,250~~
	OTHER	
24	PRINTED CIRCUIT BOARD MILLING UNIT	~~$5,364~~
25	ENGINEERING SOCIETY DIGITAL SERVICES	~~$3,105~~
26	UNDERGRADUATE ELECTRONICS SHOP	~~$8,000~~
27	MECHANICAL\CIVIL ENGINEERING 4TH YEAR CAD DESIGN LAB NETWORK UPGRADE	$2,760
28	TOOLING FOR STUDENT SHOP	$1,986
29	MEMORY UPGRADES FOR ENGINEERING COMPUTING LABS	~~$4,904~~
	Sub-Total Departmental	**$193,713**
	STUDENT	
30	UNIVERSITY OF WATERLOO ALTERNATIVE FUELS TEAM (UWAFT)	$1,530
31	TEAM ADVANCEMENT FOR THE FORMULA SAE PROJECT	$5,447
32	GNCTR 2000 TEAM	$2,689
33	MIDNIGHT SUN VI SOLAR CAR PROJECT	$5,000
34	NEW MACINTOSH FOR THE IRON WARRIOR	~~$8,428~~
35	UNIVERSITY OF WATERLOO AERIAL ROBOTICS GROUP	$7,900
	Sub-Total Student Groups	**$30,993**
	TOTAL	**$224,707**

WEEF Funding - Spring 1999

	CHEMICAL	
1	HEAT EXCHANGER TRAINING EQUIPMENT	$10,000
	CIVIL	
6	HEWLETT-PACKARD GC SOFTWARE	$1,370
8	PORTABLE D.O. METER AND PROBE	$1,260
9	WATER LEVEL METERS	$1,493
10	WORKSTATION AND PRINTER	$1,500
	ELECTRICAL AND COMPUTER	
11	E&CE 222 & E&CE 354 COLDFIRE COMPUTER EXPANSION	$1,350
12	E&CE 324 DIGITAL LAB UPGRADE TO ALTERA CPLDS	$3,000
24	PRINTED CIRCUIT BOARD MILLING UNIT	$10,000
	MECHANICAL	
18	METALLOGRAPHIC SAMPLE PREPARATION SYSTEM	$3,500
20	MECHANICAL ENGINEERING E1-2536 NETWORK UPGRADE	$3,500
21	MONITOR REPLACEMENT IN MECHANICAL ENGINEERING POLARIS LAB	$432
	SYSTEMS DESIGN	
22	PROPOSAL FOR PURCHASE OF AN EPS1024 PLUS PROJECTOR	$3,800
23	VISIO SOFTWARE LICENSES	$1,500
	OTHER	
14	FACULTY EMAIL SERVER APPLIANCE Some paid for AMT still owing is $1089.29	~~$2,500~~
26	UNDERGRADUATE ELECTRONICS SHOP	$3,400
27	MECHANICAL\CIVIL ENGINEERING 4TH YEAR CAD DESIGN LAB NETWORK UPGRA	$1,380
28	TOOLING FOR STUDENT SHOP	$1,986
	Sub-Total Departmental	**$51,971**
	STUDENT	
30	UNIVERSITY OF WATERLOO ALTERNATIVE FUELS TEAM (UWAFT)	$1,000
31	TEAM ADVANCEMENT FOR THE FORMULA SAE PROJECT	$2,400
32	GNCTR 2000 TEAM	$2,000
33	MIDNIGHT SUN VI SOLAR CAR PROJECT	$3,000
35	UNIVERSITY OF WATERLOO AERIAL ROBOTICS GROUP	$3,000
37	CLEAN SNOWMOBILE CHALLENGE	$1,500
	Sub-Total Student Groups	**$12,900**
	TOTAL	~~$64,871~~

Project never went through

~~60 000~~
60,060.00

WEEF FUNDING PROPOSALS

Department of Chemical Engineering:

Proposal #1:

Heat Exchanger Training Equipment

Submitted By:
Your Name: Siva Ganeshalingam
E-mail: sganesh@engmail.uwaterloo.ca
Phone Number: 6161
Position: Senior Technician

Description of Proposal:
Most **Process Operations** that are carried out by **Chemical Engineers** involve either the **production** or **absorption of energy in the form of heat**. The laws governing the transfer of heat and the types of apparatus that have for their main object the control of heat flow are therefore of great importance.

The four common types of Heat Exchangers found in industry are
(1) Shell and Tube Heat Exchanger
(2) Tubular Heat Exchanger
(3) Plate Heat Exchanger and
(4) Jacketed vessel with coil and stirrer

Out of these four Heat Exchangers, Shell and Tube Heat Exchanger is the one that is most commonly used in the Food and Chemical industries. **But unfortunately, we do not have a Shell and Tube Heat Exchanger in the department for students to do experiments with it.**

Therefore, I request funding from **WEEF** for the purchase of **two** items.
(1) **Bench top service unit**
(2) **Shell and Tube Heat Exchanger**

The Bench top service unit is the main control unit on which all different types of Heat Exchanger units can be mounted on. This service unit consists of
(1) **Flow sensors**
(2) **PID controllers**
(3) **Circulating pump**
(4) **Thermocouples and**
(5) **Heaters**
All measurements are **available as voltage signals for direct connection to a PC via an interface** device.

Shell and Tube Heat Exchanger consists of one Shell and seven Tubes with two transverse baffles in the shell. The tubes can be easily removed from the heat exchanger for cleaning.

Proposal Benefit:
The undergraduate Chemical Engineering as well as Environmental Engineering students will benefit a lot by doing experiments with this unit. For example,
(1) **First year students could do an Energy balance and compare the efficiencies of the Heat Exchanger at different flow rates.**
(2) Fourth year students could perform a series of experiments such as

— **Measurement of overall heat transfer coefficient.**
— **Effect of cold and hot fluid flow rate on the heat transfer coefficient.**
— **Effect of driving force (temperature difference on the heat transfer coefficient)**
— **Differences in performance between countercurrent and cocurrent operation**

(3) The main service Unit seems to be expensive. But the advantage of having this unit is that **other types of Heat Exchangers can be added any time. For example, we already have a Plate Heat exchanger in the department that has not been used for a long time**. This could be added along with the Shell and Tube Heat Exchanger. Other types can be purchased anytime we have adequate funding. **Our eventual goal is to have all four common types of Heat Exchangers hooked to the service unit so that the students can compare the performances of the different types for any particular application.**

Cost Breakdown:

[1] **Heat Exchanger Service Unit:** $ 14,659

[2] **Shell and Tube Heat exchanger**: $ 4085

Total cost: $ 18,744

Department agreed to **provide $ 4000 plus all the taxes involved and the transportation cost**. Also the installation will be done by the departmental technicians.

Funding requested from WEEF: $ 14,744

Implementation Schedule: As soon as possible

CLEAN SNOWMOBILE CHALLENGE

Submitted By:

Your Name: Mike Burtch
E-mail: wmburtch@engmail
Phone Number: 585-1725
Position: Manager, SAE Clean Snowmobile Challenge

Description of Proposal:

Money is needed for start-up costs for the new SAE Clean Snowmobile Challenge competition.

Proposal Benefits:

Money from WEEF will help ensure Waterloo is competitive in the event, which is to be held in March of 2000. Since we have not even received the snowmobile yet, the schedule for the project is very tight, and work must begin right away. However, we do not have sponsors yet.

Cost Breakdown:

$1500 – Delivery of the snowmobile: our team must pay for shipping costs and duty (the snowmobile is coming from the U.S.)

$500 – Start-up costs for the team

$500 – Assorted tools. As we are a new team we need money for the basic tools such as a torque wrench, socket set, drill, screwdrivers, etc. These basic tools cannot be borrowed from other teams, as they will be needed on a day-to-day basis.

Total: $2500

Implementation Schedule:

We were informed on July 12 that we will be responsible for the shipping costs of the snowmobile, and we will need to get the snowmobile here by the end of July.

The tools will be bought in the middle of August

Additional Information:

This is a new SAE team, and currently we are working on sponsorship packages. Also, Dr. R. Pick is working on getting sponsorship from Bombardier.

Although the department may be able to cover the shipping costs, this would be a *loan*.

Proposal #2:

SuperPro Designer Software for Environmental / Biochemical Engineering

Submitted By:

Your Name: Bill Anderson, Dept. of Chemical Engineering
E-mail: wanderson@uwaterloo.ca
Phone Number: Ext. 5011
Position: Associate Professor

Description of Proposal:

We propose to purchase a perpetual academic license for SuperPro Designer software. The software would be installed on Polaris for easy access by any students.

SuperPro Designer is a Windows-based flowsheet process simulator package. It is used for simulating environmental and biochemical processes such as activated sludge water treatment, fermentation, food processing, and air pollution control. It provides detailed mass and energy balances, and is capable of estimating equipment sizes as well as capital and operating costs for these processes. It can also estimate fugitive emissions from processes, and can generate environmental impact analyses. It is a useful tool for the design or analysis of most chemical, pharmaceutical, or environmental treatment process.

Further details can be found at the vendor's web site:
http://www.intelligen.com/in/prod/superpro/index.html

Proposal Benefits:

SuperPro Designer uses short-cut estimation methods, as opposed to the rigorous methods employed by other process simulators such as AspenPlus, making it somewhat quicker and easier to use for preliminary screening and design. It is especially good for environmental and biochemical processes, since it was developed at MIT specifically for these areas of application.

The software will be a useful teaching tool in several courses in the EnvE and ChE curriculum, namely:
EnvE 334* Environmental Chemistry
EnvE 483* Environmental Engineering Project
EnvE 484* Applied Process Analysis and Design
ChE 032* Introductory Biotechnology
ChE 562 Fermentation Engineering
ChE 564 Food Process Engineering
ChE 574 Treatment of Aqueous Inorganic Wastes
ChE 572 Air Pollution Control

* are core courses in either EnvE(Chem) or ChE. The other courses are electives with enrollments typically in the range of 15-45 students.

There may be opportunities to use the software in other courses in engineering as well. These will be identified as we gain more experience with its use as a teaching tool.

Cost Breakdown:

Requested amount: $1750.00

A perpetual academic license is available at a 90% discount from the normal price. Therefore the quoted price is $995 US plus $49.50 for shipping and handling. This corresponds to approximately $1750 CDN in total, including taxes.

Implementation Schedule:

The software will be installed as soon as possible after receipt, likely early in the Fall 1999 term. Use in courses would likely commence in the Winter 2000 term, allowing some time for faculty and staff familiarization.

Additional Information:

SuperPro Designer would complement our existing flowsheet simulators, AspenPlus and Hysis. Each of the three software packages have strengths in different areas of application, and all can be used in process design, analysis and optimization.

Proposal #3:

Upgrading of Computers and Instrument in ChE 032 and EnvE 331 Laboratories

Submitted By:
Lillian Liao
lliao@chemical X6161
Analytical Chemist

Description of Proposal:
To complete GC/FID/ECD instrument set-up with a computer. To upgrade analog spectrophotometer to digital spectrophotometer. To replace Microtox® 386 computer that is not Y2K compliant.

Benefits of the Proposal:
Access to this equipment would permit more accurate chemical determinations and improve success rate of experiments. Approximately 150 students of ChE 032 would greatly benefit from the computer and spectrophotometer upgrades. Approximately 80 students of EnvE 331 would benefit from the computer purchase.

Cost Breakdown of Proposal:

	Item	Price	Use	Description
a)	2 – JPC computers	$3, 700.00	To operate GC/FID/ECD, to operate Microtox®	Pentium II 400MHz, 64Mb SDRAM, G200-AGP 8Mb, CD-ROM, 17" colour monitor
b)	1 – Spectronic® 20 Genesys	$2, 415.00	To perform spectral readings	Spectronic® Spectrophotometer, 325 – 1100nm
c)	1 – HP Printer	$1, 250.00	To print output data from GC/FID/ECD	HP Laserjet 2100

2 can route through one printer

Implementation Schedule for Project:
Equipment will be used once available.

Additional Information:
The chemical engineering department has already purchased the corresponding Windows 95/98 software for the Microtox® computer. WEEF has partially funded the autosampler for the GC/FID/ECD. Priorty is given to item a) JPC computers, followed by item b) Spectrophotometer and then item c) Printer. All prices are current and include taxes.

Summary:

A GC/FID/ECD is capable of identification and quantification of chemical substances. With the aid of the computer, the autosampler can be used interchangeably with the GCD, thus allowing more flexibility with an analysis.

Spectronic□ 20 Genesys houses up-to-date electronics and the latest optical components. It will improve performance and capabilities in the measurement of colourimetric reactions.

Microtox□ is an instrument that measures the toxicity of a given sample. The conversion to the Windows based format software will be easier to use and will update certain features.

Total Amount Requested: $7,365.00

Proposal #4:

Upgrades for Chemical Computer Labs

Submitted By:
Your Name: Ajoa Mintah
E-mail:amintah@engmail
Phone Number: 884-9211
Position:

Description of Proposal:
The age and speed of the computers in the Chemical computer labs has been an issue for some time. This proposal is for new PCs as well as upgrades to increase the speed of existing machines

Proposal Benefits:
All chemical engineering students.

Cost Breakdown:

2 Personal Computers	2 x 1500	$3000
Upgrade to 233MHz CPU	10 x 100	$1000
Motherboard Upgrade	10 x 400	$4000

Funding requested from WEEF: $ 8000

Implementation Schedule:
As soon as possible.

only fourth year students
some money can be diverted
from funding ...

2/3 all needs to be paid (next page)

next page

Department of Civil Engineering:

Proposal #5:

Computer Projector

Submitted By:
Michael Herz
e-mail: mherz@uwaterloo.ca
Phone Number: x3411
Position: Computer Systems Manager

Description of Proposal:
Purchase a computer projector for presentations that relate to classwork such as work-reports, project courses, teaching, and special presentations.

Proposal Benefits:
Will aid undergrads from Civil, Environmental, and Geological Engineering in making professional, state-of-the art presentations

Cost Breakdown:

Total Amount Requested: $8,200

Implementation Schedule:
Immediate

Additional Information:
The Civil department is able to contribute 1/3 of the cost.

Proposal #6:

Hewlett-Packard GC Software

Submitted By: Environmental Engineering (Civil)
Mark Sobon
E-mail: msobon@sunburn.uwaterloo.ca
Phone Number: Ext. 5263
Position: Chemical Engineering Technologist

Description of Proposal:
Y2K compliant Hp3365 Multi-instrument S/W Upgrade and interface board.

Proposal Benefits:
The software will replace an existing standalone integrator. The software will allow for GC control, automation and practical data manipulation. GC control provides full instrument control, detailed method editing and storage. The software is compatible with an existing autosampler. This allows for automated sample analysis for lengthy sample runs. The software provides for practical data manipulation: data storage, peak processing functions, data reprocessing and data export.

Environmental engineering students from both Civil and Chemical departments would use the software. The courses the software would be used by are ENV 275, ENV 330 and ENV331. (Approx. 100 Students/year)

Cost Breakdown:
The Software cost is $ 1570.
The HP-IB Interface cost is $ 500.

Total Cost $ 2070.

Implementation Schedule:
Immediately, fall of 99.

Additional Information:
The Civil Engineering Department will support with partial funding to the amount of $ 700. Proposed Weef share is $ 1370. Additional information will be provided upon request.

Total Amount Requested: $ 1370

Proposal #7:

Notebook Computer

Submitted By:
Michael Herz
E-mail: mherz@uwaterloo.ca
Phone Number: x3411
Position: Computer Systems Manager

Description of Proposal:
Purchase a notebook computer for presentations that relate to classwork such as work-reports, project courses, teaching, and special presentations.

Proposal Benefits:
Will aid undergrads from Civil, Environmental, and Geological Engineering in making professional, state-of-the art presentations.

Cost Breakdown:
$7,300

Implementation Schedule:
Immediate

Additional Information:
The Civil department is able to contribute 1/3 of the cost.

Total Amount Requested: $ 7300

Proposal #8:

Portable D.O. Meter and Probe

Submitted By: Environmental Engineering (Civil)
Mark Sobon
E-mail: msobon@sunburn.uwaterloo.ca
Phone Number: Ext. 5263
Position: Chemical Engineering Technologist

Description of Proposal:

A portable D.O. Meter and probe for dissolved oxygen measurement in the field. A B.O.D adapter enables the instrument to be used for B.O.D measurements in the lab. This unit would replace a presently dead unit. There are currently two of the units in our lab, and we find the rugged and easy to use.

Proposal Benefits:

Students that would benefit from the use of the instrument (CIV E 375, CIV E 126. CIV E 472, ENV E 330, and approx. 120 per/term). The use of similar units reduces the confusion of meter operation.

Cost Breakdown:

Orion 835 D.O. Meter	$ 1680.
B.O.D Stirring Accessory	$ 120.
Total cost	$ 1800.

Implementation Schedule:

Immediately, fall of 99.

Additional Information:

The Civil Engineering Department will contribute up to 30% of the total cost for this item.
Additional information will be provided upon request.

70% of [illegible]

Total Amount Requested $1800.00

Proposal #9:

Water Level Meters

Submitted By:

Bruce Stickney
E-mail: bstickney@UWaterloo.ca
Phone Number: ext. 2908
Position: Technologist

Description of Proposal:

Acquisition of eight Narrow Mini Water Level Meters, for use in the Env.E 330 course Labs. and projects. Env.E 126 Projects and Civil and Env. Eng. 300 and 400 Projects. The meters have a 20 M. long, 6 mm. wide tape and probe with markings every 1 mm., ideal for use in narrow diameter applications as small as 10 mm. A battery powered buzzer and light indicate when contact has been made with the water surface, and readings are made directly from the tape at the top of the well casing or borehole.

Proposal Benefits:

Currently the Dept. is loaning equipment for this purpose and the source has been unreliable, and the equipment is in poor condition. This would provide equipment at any time, and sufficient numbers so that experiments can be conducted during regularly scheduled Lab. times.

Cost Breakdown:

The cost per meter is $ 533.00

4 * $ 533.00 = $ 2132.00

Implementation Schedule:

The equipment would be put to use immediately

Additional Information:

The Civil Engineering Dept. has just purchased four of these units to conduct labs. this term and the additional four. would provide sufficient equipment to conduct the labs. without dependance on loaned equipment.

The Civil Engineering Department will contribute up to 30% of the total cost for this item.
Additional information will be provided upon request.

Total Amount Requested: $2132.00

Currently loans these

Proposal #10:

Workstation and Printer

Submitted By:
Bruce Stickney
E-mail: bstickney@UWaterloo.ca
Phone Number: ext 2908
Position: Lab. Tech.

Description of Proposal:
The workstation needed is a Pentium II-400 MHz with a Printer, to upgrade the 9 year old 386-25MHz computer, in use on our Ion Chromatograph. It is our intention to upgrade this system to Y2K compliant software and a computer fast enough and with sufficient memory and HD space for the newer software, and data is required. The newer software provides much more power for instrument control and data manipulation than is currently possible and is fully Y2K compliant. The printer will replace a malfunctioning dot-matrix printer to provide hardcopy print-outs of data. It is further possible to then Network this computer for data transfer or printing from/to another location.

Proposal Benefits:
Increased power and Y2K compliance are the main benefits, however this new software runs on Windows 95/98 which allows us to upgrade other ancillary software such as Excel to a more recent version, and something more familiar to students. The Ion Chromatograph is currently used in Civ.E. 375, 472 and Env.E. 330, 375 and Projects, benefiting 150-175 students per year.

Cost Breakdown:

Pentium II-400 MHz Workstation (see attached description)	$ 1965.00
HP LaserJet 2100 M Printer	$ 1120.00
TOTAL	**$ 3085.00**

Implementation Schedule:
Immediate

Additional Information:
The Civil Engineering Department will contribute up to 30% of the total cost for this item.
Additional information will be provided upon request.

Total Amount Requested: $3085.00

Department of Electrical and Computer Engineering

Proposal #11:

E&CE 222 & E&CE 354 Coldfire Computer Expansion

Submitted By:
Eric Praetzel
E-mail: praetzel@ece.uwaterloo.ca
Phone Number: x5249
Position: Lab. Staff

Description of Proposal:
Upgrade the number of 5206 Coldfire computers from 50 to 65.
The cost is $675 ea. for the 5206 Coldfire computer. The E&CE Dept. will absorb the cost of the adapter board, case, associated parts and power supplies for the computers (estimated at $250 per computer).

Proposal Benefits:
Student usage of the existing 50 Coldfire computers was very heavy in the past few terms and we'd like to expand the number of Coldfire computers; putting one on every Polaris workstation. The 5206 Coldfire will also be going out of production in a year or two. It will be good to have some extra units to cover breakage and loss.

The 5206 Coldfire compters are used by:
E&CE 222: 250 students per year; expanding to 350+ students/year with ATOP expansion
E&CE 354: 120 students per year; expanding to 300+ students/year with ATOP expansion & Mechatronics

Cost Breakdown:
Minimum: 2 units = $1,350
Ideal: 15 units = $10,125

Implementation Schedule:
The computers will be installed aprox. 2 to 3 months after delivery. Ie the enclosures must be built.
Additional Information:
Any number of units from 2 to 15 is acceptable.
The lab currently has 50 Coldfire computers and 65 Polaris workstations.
We investigated upgrading to newer versions of the Coldfire computers (53xx and 54xx) but the cost is higher per computer and it would involve a redesign of the labs for both courses and not offer any teaching benefits.

Importance Rating

○ Very Important
○ Necessary
● Helpful

Total Amount Requested: $10,125

Proposal #12:

E&CE 324 Digital Lab upgrade to Altera CPLDs

Submitted By:
Eric Praetzel
E-mail: praetzel@ece.uwaterloo ca
Phone Number: x5249
Position: Lab. Staff

Description of Proposal:
Upgrade the E&CE 324 lab. hardware from Speedwire and GAL technology to Altera CPLDs.
It is proposed that at least 25 Altera boards be purchased at $100 US ea.

Proposal Benefits:
The lab. currently uses Speedwire technology to build electronic circuits. As of 1998 Speedwire went out of production and it is impossible to find replacement parts. There is no comparable, durable, technology in mass production. A committee was formed to examine the options and it was decided to replace the physical circuit wiring (which the students did) and upgrade from GALs to programmable logic technology.
The software is supplied for free by Altera (unlimited number of licenses) but we must purchase the boards for the students to use.

These boards would be used by:
E&CE 324: 170 students growing to 300 students after the ATOP expansion.

Both E&CE and Mechanical "Mechatronics" students use this equipment.
Cost Breakdown:
Minimum: 5 units = $875
Ideal: 25 units = $4,375
Overkill option: 40 units $7,000 or $14,000 for 80 units

Implementation Schedule:
Purchase at least a small quantity some as soon as possible for the design and testing of the labs.
Student use starts in January 2000.
Additional Information:
Any number of units from 5 to 80 is acceptable.
The lab currently has 25 working computers. This will be expanded within the next year to an estimated 40 to 80 stations within a year.
These price for these boards is volume discounted and it is expected that some students will purchase their own for 4th year projects or simply to allow them to perform most of their lab work off campus.

Altera may give an addition price discount and the E&CE Dept. will purchase additional units if necessary.

Importance Rating

● Very Important
○ Necessary
○ Helpful

Total Amount Requested: $14,000

Proposal #13:

E & C E Unix Room Chairs

Submitted By:

Mattias Hembruch
mghembru@ece.uwaterloo.ca
Extension 6165
E&CE Software Specialist

Description of Proposal:

Chairs for E&CE Unix room (aka Sunee). Currently, the chairs in the three Unix rooms are an assortment of various chairs that have been collected over the years. Some swivel and/or roll, others are simple plastic chairs. A few chairs are already past their useful life.

Proposal Benefits:

Students spend a great deal of time in the Unix rooms working on various 3rd and 4th year course projects. The desks we have are of excellent quality, but the lack of good chairs is a potential ergonomic threat. An expansion of these facilities is planned due to increased enrolment, but these plans have allocated no funds for the upgrading of existing furniture, only for new furniture required for the expansion.

Cost Breakdown:

Chairs without armrests: $145 each (incl. taxes)
Chairs with armrests: $175 each (incl. taxes)

There are currently 3 rooms, each containing 6 workstations.
Due to individual preferences, a mix of chairs with and without armrests is proposed.

9 * $145 = $1305
9 * $175 = $1575

Partial Funding options:
6 of each, total: $1920.
3 of each, total $960.

Implementation Schedule:

As soon as possible.

Total Amount Requested: $2880.

Proposal #14:

Faculty Email Server Appliance

Submitted by:

Beth Jewkes
Department of Engineering Computing
e-mail: emjewkes@engmail.uwaterloo.ca
Phone: (519)-888-4601
Position: Associate Dean for Engineering Computing

Description of Proposal:

Engineering Computing is an academic-support department within the Faculty of Engineering which provides leadership in the development and support of the Waterloo Polaris environment and the faculty computing communications network. It also manages and supports general purpose computing labs for academic use within the faculty and a number of servers that provide faculty-wide web and e-mail services to undergraduate students.

The focus of this proposal is to provide a high-quality reliable and scalable replacement for engmail.

Background:

Currently, the faculty server 'engmail' provides sendmail and IMAP and POP servers to process and serve e-mail for engineering undergraduates, many staff and faculty. It processes 16,000 to 17,000 messages per day and responds to an average of 40,000 requests to check mail per day.

Demand for email services has been growing in several dimensions:

- the number and size of email messages
- an increased use of attachments
- an increase in the number of users who log in to engmail directly from home, co-op workterms and the residences. This will increase further as the number of Bell high speed access from home and Rogers cable users increase.
- an increase in use of the more demanding IMAP protocol (users log into the server, process mail and typically leave email on the server; the older POP protocol is used to download email from the server in a quick burst).

Engmail started its life in August 1997 as a single processor Pentium running FreeBSD. It has had memory upgrades to 192MB Ram later in 1997, and has OS upgrades in December 1997, June 1998 and May 1999. Due to increased demands, it was upgraded to dual 350MHz Pentium II processor machine with 392MB RAM, 8GB user disk space and 2GB system disk space in May 1999.

We are finding that the current email hardware and software platform and its expansion path to be limited in its scalability and reliability. Operating system upgrades are necessary to keep up with security patches and have proven to be time consuming and inconvenient for users (i.e. downtime for engmail). Frequent hardware upgrades have been necessary to keep up to demand, but this is proving to be a catch-up game with the current platform and requires constant monitoring and system administration.

We feel it is necessary to move to a more substantial, scalable system that is more easily supported for this crucial part of our computing environment. This is the focus of the proposal to WEEF

The Proposal:

To purchase a Mirapoint M1000 email appliance. (see http://www.mirapoint.com for more information). The M1000 is a dedicated standards-based email server which will scale easily to support the growing workload we are experiencing with email. The M1000 is designed exclusively for sending, receiving and

storing email. Features such as auto-reboot , RAID, and single-purpose software will provide our users with greater reliability and service. Support will be simplified, security increased (there is no root account to hack) and it can be backed up by the Campus Legato system.

Proposal Benefits:

The benefits of the proposed server are both for users and system administrator:

- improved reliability, response time and security for users
- scalability for the future without major upgrades
- simplicity of management and support (system upgrades, backup) - lowers cost of ownership.
- spam screening capabilities

Cost Breakdown:

The request to WEEF is for a portion of the cost of the email server. Engineering Computing will match this amount.

Requested Funding:

Description	Cost(US)	Cost (CAN) Incl Taxes
Mirapoint M1000 Internet E-mail Appliance	$22,900	$37,145
System unit, embedded operating system and Mirapoint software 384 MB Memory 1 RAID 5 controller, 1 external UPS 36GB User space (2 active + 1 parity + 1 hot spare 18GB HDs)		
Contribution from Engineering Computing		$32,145
Request from WEEF		*$5,000*

Implementation Schedule:

The fall term is needed to acquire, test and put a new system into production. Implementation would take place in December 1999.

Total Amount Requested: $5000.00

Proposal #15:

LABVIEW TRAINING COMPUTER

Submitted By:

Edward Spike
E-mail: spike@engmail.uwaterloo.ca
Phone Number: X3716
Position: "Laboratory Instructor"

Description of Proposal:

A single station training computer is proposed for use in evaluation of data acquisition and automated systems control. This initial station will have two channels of 21 bits of acquisition and a digital and analogue input/output card. The DAC (digital to analoque converter) the ADC (analoque to digital) and digital I/O card will be used to control the various processes and automated equipment.

Automated digital oscilloscopes, digital spectrum analyzers (AUTOBODE), digital transistor curve-tracers, and digital motion can be used to enhance future laboratory work.

Proposal Benefits:

The single station training computer will be used to train staff and students within the Faculty of Engineering. Development of LABview software for automated laboratory systems is planned for implementation over the next two years. LABview will be used to allow computer screen formats of the processes, the data display, and the graphics. Data acquisition and automated systems control cards for the computer play an important part in the future of the laboratories with the University of Waterloo and with in the Faculty of Engineering. Other groups within the University may have similar needs for which they may wish access.

This station will be used for training and evaluation of computer automated data acquisition and control of processes. The graphical interface via LABview will allow the student user to have a simpler control panel and results display of tabular and graphical data. The student users control panels can be developed so that the panel complexity can be increased as the user becomes familiar with the process and instrumentation.

Progressive more complex equipment panels can be developed. An example is the oscilloscope. The student can start with a simply front panel control layout and then progress to a more complex front panel. The additional functionality of the front panel can be progressive with the experiments and / or with the term/year of the course. The second year student would have fewer controls on the instrument panel than the third or the fourth year student.

This preliminary training station will allow the development of several types of digitizing measuring systems and control systems for use in any department.

Cost Breakdown:

Computer	(supplied by E&CE Department and IST – as needed)	0.0
Voltage Controlled Function Generator (supplied by E&CE Department)		0.0
Signal Assembly Accessory Box – NI 777382-01		520.00
Two digitizing boards (two oscilloscope channels at 21 bits)		
NI5911orNI5912 with RTSI cable	11,000.00	
DAC – Digital to Analogue Converter & ADC – Analogue to Digital Converter		1600.00
Transistor Test Jig (with power supply)		120.0
	Taxes	1986.00

Total	**13240.00 +1986.00**

Implementation Schedule:

This preliminary station will be used starting July 1999. The station will be used to develop the skills required to automate the experiments in the E&CE-241, 316, and 318 laboratories.

Additional Information:

The E&CE-100 course will receive benefits of demonstrations. The E&CE-380 course will have future consideration for the AUTOBODE functionality. This station will be used to train the staff and advanced students. Plans for a multi-station laboratory for E&CE-241, 318, and possibly 380 are being refined to make use of the development work with this first work station. The ITS and the Engineering Computing Department are have organized course to teach LABview software use and the subsequent implementation of the hardware.

Total Amount Requested: $15226.00

Proposal #16:

E&CE 427 Polaris Computer Upgrade

Submitted By:
Eric Praetzel
E-mail: praetzel@ece.uwaterloo.ca
Phone Number: x5249
Position: Lab. Staff

Description of Proposal:
Upgrade the obsolete E&CE 427 computers. The computers have been thrown out and need to be replaced with Polaris capable machines. E&CE 427 uses a BORG board to test a microprocessor which the students have designed and simulated. The BORG board plugs into a standard PC and uses DOS based test software with Xilinx 4005E programmable logic chips FPGAs.

Purchase Celeron 266 computers with 64M of RAM and 17`` monitors.
Proposal Benefits:
These computers are used by the E&CE 427 students as general Polaris machines and for their laboratory design, simulation and testing in E&CE 427.

These computers would be used by:
E&CE 427: 190 students per year; expanding to 250 students/year with ATOP expansion
Cost Breakdown:
Each computer is $1050 each
Each monitor is $450 each
Suggested purchase 1, 2 or 3 computers: $1,050, $2,100, or $3,150
Monitors are less important and should not be purchased till after the computers. Ie. I have access to monitors that can be used on a temporary basis.

Implementation Schedule:
The computers will be installed within 1 month of delivery.
Additional Information:
The E&CE Dept. currently has 3 BORG boards but will be expanding to 4 or 5 within a year.

Importance Rating
○ Very Important
● Necessary
○ Helpful

Total Amount Requested: $3150.00

Department of Mechanical Engineering

Proposal #17:

FUEL CELL DEMONSTRATION PROJECT

Submitted By:
Professor Xianguo Li
E-mail: x6li@mecheng1.uwaterloo.ca
Phone No.: Extension 6843
Position: Professor

Description of Proposal:
Purchase of equipment to construct a fuel cell for classroom demonstrations and for final year projects.

Proposal Benefits:
Provides the ability to provide experience with the latest technology in fuel cells. The fuel cell arrangement will allow design modifications and measurements to be made for final year projects.

Cost Breakdown:

Membrane-electrode assembly	$7,492
Flow Distribution Plates	$2,040
Instrumentation and controls	$3,963
GST and Shipping	$1,158
Total	$14,653

Implementation Schedule:
Spring Term 2000

Additional Information:
Fuel cells are currently under development for use in buses and automobiles. Commercial vehicles are expected within 5 years. Considering the growing interest in fuel cell technology, we would like to introduce a demonstration in ME 459 (Energy Conversion) and have final year projects in fuel cell development. There is no one company that can supply a complete unit. Therefore it will be necessary to purchase components and construct the unit. This will be a rich source of final year projects.

Because of the high cost we may spread this request over 2 terms.

Total Requested Amount: $14, 653.00

Proposal #18:

Metallographic Sample Preparation System

Submitted By:
Professor Steve Corbin
E-mail: scorbin@surya.uwaterloo.ca
Phone No.: Extension 6132
Position: Professor

Description of Proposal:
Purchase of a Struers semi-automatic metallographic sample preparation system.

Proposal Benefits:
A wide variety of courses in materials (ME 230, ME435, ME 532, ME 535, ME 544) require the preparation of metallurgical samples for microscopic examination. There is considerable effort involved in our current system of hand preparation and this is not representative of modern techniques. This purchase would greatly enhance the lab experiments in these courses and in final year projects.

Cost Breakdown:
Purchase of Struers semi-automatic metallographic sample preparation system. $7250

Implementation Schedule:
Fall Term 1999

Additional Information:
The preparation of metallographic samples is a technique that all students enrolled in 400 and 500 level materials courses use to complete their lab projects. Currently they perform this task by hand and with one sample at a time. Over the years the students have increasingly been asked to study materials other than the basic steels. Soft materials such as Aluminum, solders, brazes, brass etc., and complex materials like composites and weldments are difficult to successfully prepare by hand. The purchase of a semi-automatic metallographic preparation machine would allow the students to complete their projects using automated equipment, which has become standard in industry. Their projects would be greatly enhanced by the production of clear and professional metallographic information.

Total Requested Amount: $7250.00

cost share

Proposal #19:

VersaStat Potentiostat/Galvanostat

Submitted By:

Professor Steve Corbin
E-mail: scorbin@surya.uwaterloo.ca
Phone No.: Extension 6132
Position: Professor

Description of Proposal:

Purchase of a VersaStat Potentiostat/Galvanostat for the measurement of passivation behaviour during corrosion.

Proposal Benefits:

Corrosion is one of the major failure modes of mechanical and civil engineering structures. Therefore one of the laboratory experiments in ME 230 deals with corrosion. The current laboratory equipment is unreliable and old. Modern equipment would provide an improved lab and allow measurements to be recorded directly on a computer. ME 230 is a core Mechanical Engineering course with approximately 160 students per year completing this course. This equipment may also assist in demonstrating the Passivation behaviour of metals in ME 215, which is now given to mechanical engineering students in 1B.

Cost Breakdown:

Purchase of VersStat Potentiostat/Galvanostat	$9850

Implementation Schedule:

Fall Term 1999

Additional Information:

Corrosion of engineering material is a key subject taught in ME 230 and represents the only significant exposure to corrosion our mechanical engineering students receive in their core program. One of the three labs in the course deals with corrosion. The corrosion lab includes the measurements of passivation behaviour and requires a potentiostat. The system used in the past is over 15 years old and is currently not in working order. The purchase of a VersaStat Potenitostat would allow students to perform passivation experiments using modern equipment, which can interface with a PC computer. Therefore, the purchase of this equipment would greatly enhance the educational experience of our students in the important area of corrosion.

Total Requested Amount: $9850.00

Gabriel Fowler

Proposal #20:

MECHANICAL ENGINEERING E1-2536 NETWORK UPGRADE

Submitted By:

Peter Routledge
E-mail: proutled@surya.uwaterloo.ca
Phone Number: extension: 3711
Position: System Administrator

Description of Proposal:

ROOM E1-2536
Scenario 1
Upgrade network infrastructure to 100Mb switched Ethernet
Scenario 2
Upgrade network infrastructure to 10Mb switched Ethernet

Proposal Benefits:

- Increased network speed for file and application serving
- Boost performance for Polaris Workstations
- Faster response for external applications such as Netscape; FTP and Telnet

Cost Breakdown:

Scenario 1
$2760 Cisco WS-C2924-XL 24 ports fixed autosensing 10/100 Ethernet Switch
$3313 Cisco WS-C2924M-XL 24 port fixed autosensing 10/100Mb Ethernet switches (2 expansion slots)
$500 Cisco 4 port 10/100 expansion module
$1392 ($29ea.) 48 Dlink FE530TX 10/100 Mb Ethernet Cards
total=$7965
Scenario 2
$2840 two Cisco 24 port 10 Mb Ethernet switches
total=$2840

Implementation Schedule:

Fall term 1999

Additional Information:

The movement afoot is to have a Netappliance available this Fall term to provide file serving for all Polaris accounts. This means increased network usage because students personal files will then be coming from the Netappliance as opposed from the local Polaris server.

Scenario 1 is definitely our departments first choice for several reasons. The biggest reason being the fact that the University is moving towards 100Mb switched Ethernet as a standard as opposed to a option. If we don't implement the change this room will quickly become out-of-date and be unable to work the way it was intended. Cost effectiveness is always an issue: No one wants to spend money just for the sake of spending money. Spending more money now means that we will not be left with obsolete equipment 2 years down the road that needs to be replaced.

Scenario 2 is an alternate choice which is simply the cheaper choice. It would provide a solution at a cost of productivity and eventually have financial bearing because the equipment would have to be replaced within a short time.

Total Amount Requested: $2840.00

Proposal #21:

Monitor Replacement in Mechanical Engineering Polaris Lab

Submitted By:

Peter Routledge
E-mail: proutled@surya.uwaterloo.ca
Phone Number: extension: 3711
Position: System Administrator

Description of Proposal:

Replace existing Datatrain monitors with newer Adi Microscan 5p+ 17in. monitors in the Mechanical Polaris labs (E2-1304 and E2-2354)

Proposal Benefits:

more reliability
less down-time (while monitor is replaced or repaired)
less cost

Cost Breakdown:

$5184 ($432ea.) for twelve Adi Microscan 5p+ 17in. Monitors
total=$5184

Implementation Schedule:

Fall term 1999

Additional Information:

The existing monitors are way beyond their warranty. They have continually caused problems. It is to the point that it is more cost effective to replace them, then to spend the man hours as well as repair cost on them. The Adi monitor's offer a great warranty of 48 months.

Total Amount Requested: $5184.00

Department of Systems Design Engineering

Proposal #22:

Proposal for Purchase of an EPS1024 PLUS Projector

Submitted By:
Alex Pak
E-mail: apak@engmail.uwaterloo.ca
Phone Number: 725-4369
Position: 3A Systems Academic Rep

Description of Proposal:
The Electrohome EPS1024 PLUS Projector interfaces with a PC to providing the capability to deliver high impact presentations. The Systems Design curriculum contains five courses at the undergraduate level, which require presentations. Systems students and faculty also participate in several inter-university competitions each year, where excellent presentations are critical to convey a positive professional image of the University.

Although the AV department has several similar projectors available, it is often difficult to book their use in times of heavy usage. A projector dedicated to the Systems Design department would provide increased availability to Systems students, and would also reduce scheduling conflicts with students in other engineering programs.
Proposal Benefits:
This proposal would:

Reduce booking conflicts of the AV Centre projectors in times of heavy usage (ie Conferences, End-of-Term Presentations and Competitions).
Increase the availability of the AV Centre projectors for students in other engineering programs.
Allow students to practice presentations in advance (currently the AV Centre will only provide projectors half an hour before the presentation).
Provide the capability for more effective presentations both within the classroom, and outside the school at conferences and competitions.
Involve a one-time only request for funds. The Systems Design department has agreed to cover any future maintenance costs associated with operating the projector

Cost Breakdown:
The Systems Design department has offered to pay for half of the purchase cost of the projector and stand, as well as any future annual maintenance costs (such as replacement bulbs).

Projector Cost: $8700.00
Stand Cost: $300.00
Total: $9000.00
Funds Requested from WEEF: $4500

Implementation Schedule:
The projector will be purchased through EDCOM (the distributor for the AV Centre) as soon as the funds are available. It will be kept in the Systems Undergrad Teaching Area (in CPH) and will be managed by Kevin Krauel, the Systems lab technician.

Total Amount Requested: $4500.00

Complete with

proposal 6

Proposal #23:

Visio Software Licenses

Submitted By:

Nick Krokoszynski
E-mail: nrkrokos@engmail
Phone Number: (519) 579-3027
Position: Systems 1B student

Description of Proposal:

On behalf of the Systems Design Engineering Department, I would like to propose that WEEF assist in the purchase of 10-15 licenses of Visio Professional 5.0 for use in the DASL and RASL labs by Systems Design students.

Proposal Benefits:

Visio software is a fast and versatile diagramming tool. It uses the drag-and-drop approach and contains hundreds of templates and pre-designed objects to minimize the time spent in creating block diagrams. Thus, Systems Design students will be able to minimize their time spent creating electrical circuits, systems diagrams, mechanical diagrams and flow charts for inclusion in reports and presentations.
Cost Breakdown:
Cost for 1 license of Visio = $300.00

Cost breakdown for 15 licenses:

Total cost for 15 licenses = $4500.00
Contribution from the Systems department = $2250.50
Total amount requested of WEEF = $2250.00

Cost breakdown for 10 licenses:

Total cost for 10 licenses = $3000.00
Contribution from the Systems department = $1500.00
Total amount requested of WEEF = $1500.00

Implementation Schedule:

Purchase of Visio software licenses: Early to mid August, 1999
Installation of Visio software in the DASL and RASL labs: Mid to late August, 1999

The software will be ready for use at the start of the 1999 fall term.

Additional Information:

The idea to purchase Visio software was initially recommended by upper year Systems Design students. They realize that Systems Design students must create many technical diagrams for reports and presentations, and believe that Visio is superior to Power Point and traditional CAD programs for this purpose. These upper year students will be returning in the fall to complete their fourth year and can thus benefit from the purchase.

I asked my classmates to comment on their experiences with Visio software during work terms. All responses were positive towards the purchase of Visio software, and included praises for Visio's ease of use and effective tools for creating diagrams. Visio diagrams integrate smoothly with Microsoft Word documents.

Total Amount Requested: $2250.00

always pay first

Other

Proposal #24:

Printed Circuit Board Milling Unit

Submitted By:

Ed Spike
E-mail: spike@engmail.uwaterloo.ca
Phone Number: x3716
Position: Laboratory Instructor

Description of Proposal:

The milling of copper cladding from the printed circuit board will allow for a non-chemical process. The milling unit can us AutoCAD type computer files. Cutting head depth position can be adjusted for the various thickness of the copper cladding on the circuit board substrate. Cutting with minimum is 0.006 inches.

Proposal Benefits:

Users from all Engineering departments will have a facility to produce one-off circuit boards after proofing the layout on AutoCAD (and other layout software).
Chemical etching requests from many Engineering groups have been turned down in the past due to the demand on the supervising staff's time and due to the safety factor in using the chemicals. The dependence on chemicals would be removed. Minimum setup training would be required.

Previous requests from:

- -Courses E&CE-473 and 474.
- -Systems Design undergrad projects
- -Fourth year projects in E&CEng., Mechanical Eng., and Systems Design Eng.
- -Solar Car
- -Baha Car
- -Robotic automation undergrad projects.

Cost Breakdown:

Model QCS-5000	$17,230.00		
Taxes	$2,584.50	SubTotal	$19,814.50
Standard Materials Kit	AS-Kit-STD		$ 426.00
Taxes	$ 63.90	SubTotal	$ 489 90
		Total	$20,304.40

Implementation Schedule:

To be ready for fall 1999.
Additional Information:
All users would be asked to cover the cost of milling bits and copper clad board used.
Software and computers are available now.
Quote attached.
Vacuum cleaner and safety shield to be supplied by E&CE Dept.
Printed Circuit Board stock to be purchased and kept by E&CE Dept.

Total Amount Requested: $20, 304.40

Oct 2000 From Mech E

Proposal #25:

Engineering Society Digital Services

Submitted By:

Ian Tien
E-mail: itien@engmail.uwaterloo.ca
Phone Number: 519-883-1282/519-888-4567 x2693(IW office)
Position: Engineering Society Class Representative, 2B Computer Engineering

Description of Proposal:

The proposed equipment and software purchases would allow the Waterloo engineering society to produce an array of services. These include:

1. *Course Material Archiving*

EngSoc would assist professors in archiving course materials in PDF format. Hard copies of old exams, lecture notes, assignment solutions, etc. could be quickly digitized and made available on-line

2. *On-line Resume Database*

EngSoc would be able to construct an on-line student resume database to facilitate the co-op process by employers to recruit students independent of the co-op process. This would increase work opportunities and take stress off the co-operative education department.

3. *Media Archive*

EngSoc would be able to archive newspaper/magazine articles pertaining to the successes of Waterloo engineering. These documents will be made available on-line and will be used to chronicle our collective accomplishments. The purpose of this archive would be to solidify and maintain the reputation of our school.

The engineering society's digital services would be available for use by both students and faculty for the purpose of improving and promoting Waterloo engineering.

Proposal Benefits:

- Increased utility of course materials
- Archiving of course resources
- Improved job-seeking process
- Reduced volume on career services
- Reduction of paper waste
- Lower cost of operation
- Increased school reputation

Cost Breakdown:

XEROX WorkCentre 385 (scanner w/ autosheet feeder) - $600US / $900 Cdn
This items is required for high-speed multi-document scanning
http://www.xerox.com/go/xrx/products/overview.jsp?id=wc385&cat=%2fEquipment%2fFaxing%2fSmall+Office+%26+Home+Office

Adobe Acrobat Capture - $895 US / $1350 Cdn
This software will be used to convert scanned documents into standardized, searchable PDF forms that can be freely distributed.
http://www.adobe.com/prodindex/acrobat/capprice.html

Adobe Acrobat - $295 US / $450 Cdn
This software will allow direct conversion from softcopy files directly into PDF
http://www.adobe.com/prodindex/acrobat/price.html

Total Amount Requested - $3,105

= ($900 + 1350 + $450) * (1 + GST + PST)

Implementation Schedule:
The new systems would be implemented in Winter of 2000 and should be ready by the end of term. The scanner and software would be installed on a Polaris machine connected to the network. Digitized files could be immediately produced.

The rate at which the project would be completed will depend on the resources available each term.
Additional Information:
Digital services increase productivity by preserving materials and making them easily available. Case studies on their implementations have been conducted at a number of large organizations, such as Lockheed Martin, Bloomberg, and First Union Corp.
(http://www.adobe.com/studio/casestudies/acrobatcapture.html)

Eventually, all universities and large organizations may employ digital services of one form or another. Digital services may one day be as ubiquitous as email accounts and internet access.

Waterloo has the opportunity to implement digital services in an efficient and low-cost manner using the expertise of the student-run engineering society We should start as soon as possible.

Total Amount Requested = $3,105

Proposal #26:

Undergraduate Electronics Shop

Submitted By:

Cheryl Card
E-mail: clcard@engmail.uwaterloo.ca
Phone Number: (519) 886-1746
Position: Student

Description of Proposal:

This is a proposal outlines the need for an undergraduate electronics shop, and asks WEEF to partially fund this project. Currently, there is no facility available to Engineering undergraduate students to do microelectronics work and wiring for student team projects and fourth year projects. In addition to an increasing number of student teams which need this type of shop, there will be more students involved in mandatory fourth year projects who need a place to do electronics work. Funding from WEEF would give this project the legitimacy required to ask industry and the departments for additional funding.

Proposal Benefits:

Electronics shop would be available to all undergraduate students
Provides new and existing student teams with proper electronics facilities, without the expense of purchasing the required equipment themselves
Reduce the number of WEEF proposals submitted by project teams for electronics equipment
Provides student teams with the ability to include electronics in their projects who would not otherwise consider the possibility
Supports mandatory fourth year projects now required for engineering accreditation in Electrical & Computer Engineering, Mechanical Engineering and Systems Design Engineering
Provides students with hands-on electronics experience, which complements the academic focus of the engineering education

Cost Breakdown:

Please refer to the budget included below for a breakdown of costs.

Option 1 – Total funding **$8000.00**
This option would have WEEF completely funding the Electronics Shop. This would allow the project to proceed quickly, in order to have the shop operational for the beginning of the Winter 2000 term.

Option 2 – Basic Equipment **$6000.00**
This option would provide the Electronics Shop with the basic equipment needed to do microelectronics work and wiring/cabling.

Option 3 –Basic Equipment w/o Oscilloscope **$3500.00**
This option would fund the basic equipment required for the Electronics Shop, with the exception of the oscilloscope. This is an essential piece of equipment, so the additional funds required to purchase the scope would have to be obtained from other sources.

Budget:

Microelectronics:		Option 1	Option 2	Option 3
Oscilliscope	100 MHz, 2-channel, cursors, store-to-disk	$ 3,000	$ 3,000	
Bench supply	2 output, analog, voltage: +3/+5 to +15 V, current: 1 to 10 A	$ 350	$ 350	$ 350
Soldering station	ESD safe, temmperature controlled, auto shut-off	$ 1,000	$ 1,000	$ 1,000
Static mat	With connecting cables and wrist straps	$ 225	$ 225	$ 225
Magnifying lamp		$ 300		$ 300
Heat gun		$ 150		$ 150
Logic probe		$ 90		$ 90
Twin clip holder		$ 45		$ 45
Leads	Banana plugs, coax, etc.	$ 100		$ 100
	Total:	$ 5,260	$ 4,575	$ 2,260
Wiring/Cabling:				
Soldering iron	Auto shut-off, heavier gauge, higher wattage than microelectronics iron	$ 150	$ 150	$ 150
Crimping tool		$ 300		
Multimeter		$ 200	$ 200	$ 200
Vice		$ 160		
Wire wrapping tool		$ 10		
	Total:	$ 820	$ 350	$ 350
Tools:				
Standard screwdrivers	Robertson, Phillips, Flat-head	$ 40		$ 40
Jewelers' screwdrivers		$ 10	$ 10	$ 10
Pliers	Needle-nose, side cutters	$ 10	$ 10	$ 10
Other	Wire strippers, solder puller	$ 10	$ 10	$ 10
	Total:	$ 70	$ 30	$ 70
Furniture:				
Benches	2 long benches	N/A	N/A	N/A
Stools	2 to 4 bench stools	N/A	N/A	N/A
Lockers	Small lockers for storing projects and materials	$ 300		
Power bars		$ 30		
Door lock	Punch-key type	$ 250	$ 250	$ 250
Storage	Tool boxes, storage units	$ 50		
Security devices	Tie-downs for large equipment	$ 25	$ 25	$ 25
	Total:	$ 655	$ 275	$ 275
Miscellaneous:				
Misc.	Solder, flux, wire, electrical tape, zip ties, assorted resistors and capacitors	$ 50	$ 50	$ 50
Taxes		$ 1,028	$ 792	$ 451
	Total Cost:	**$ 7,883**	**$ 6,072**	**$ 3,456**

Implementation Schedule:

Summer 1999 – Arrange funding for project from WEEF, Electrical & Computer Engineering, Mechanical Engineering, Systems Design Engineering and the Faculty of Engineering

Fall 1999 – Find suitable space, purchase equipment, and prepare electronics shop for use. Also, lobby the Engineering Society to establish a directorship to run the electronics shop.

Winter 2000 – Shop open for student use.

Additional Information:

This proposal is supported by the following student groups:

Group	Contact	E-mail
Formula SAE	Jonathan Hook	jbhook@engmail
Midnight Sun	Rob Wood	rhwood@engmail
Waterloo Aerial Robotics Group	Chris McKillop	cdmckill@warg

Management of Electronics Shop:

The electronics shop could be run as an EngSoc directorship, similar to the Darkroom. The shop could be available to students on a fee-per-term basis, in order to cover the cost of supplies as well as providing some additional security for the shop. The Director would be responsible for ordering supplies, keeping the shop clean, and orienting new members. The establishment of this Directorship will be raised with Council in the Fall 99 term, once funding has been established. Including the electronics shop under the management of EngSoc would reinforce that the shop is available to all students.

Other Sources of Support:

If WEEF supports the establishment of an electronics shop, other sources of funding could be pursued as well. These sources include industry, the departments (E&CE, ME, SYDE), the Dean's office and the Engineering Society.

Future Upgrades:

Other equipment which could be added includes a microscope for fine gauge soldering, and a computer for data analysis and plotting oscilloscope output.

Total Amount Requested: $8000.00

Proposal #27:

MECHANICAL\CIVIL ENGINEERING 4TH YEAR CAD DESIGN LAB NETWORK UPGRADE

Submitted By:
Peter Routledge
E-mail: proutled@surya.uwaterloo.ca
Phone Number: extension: 3711
Position: System Administrator

Description of Proposal:
Convert the 4th year Cad Design lab (E3-1101) to 100Mbit switched Ethernet.

Proposal Benefits:
Provide a faster Network Environment for application serving
Allow for the installation of additional software packages (such as Ideas, AutoCAD 2000) that require the increased speed to run adequately.
Expandability

Cost Breakdown:
$2760 Cisco WS-C2924-XL 24 ports fixed autosensing 10/100 Ethernet Switch
total=2760

Implementation Schedule:
Fall Term 1999

Additional Information:
Currently the Mechanical\Civil 4TH year CAD design lab (E3-1101) has 12 NT workstations and one NT server connected to a 10Mb Hub. Each machine is: wired with Category 5 UTP cables; has a 10/100BASET Ethernet card installed therefore new Ethernet cards will not be needed nor will new cabling be required.

The purpose of the lab is to provide 4th year mechanical and Civil undergraduate students access to software packages that are course related and not readily available elsewhere on campus. Examples of some of the software packages available or in the planning stages are: MasterCAM; Ideas; AutoCAD; also a Finite Element package will be made available.

Total Amount Requested: $2760.00

Proposal #28:

TOOLING FOR STUDENT SHOP

Submitted by: Clarence Wallace, Supervisor, Engineering Student Shop
Extension: 2301

E-Mail: rkap@surya uwaterloo.ca

Description of Proposal:

The Student Machine Shop provides essential hands-on experience for all undergraduate students either for core class courses or special projects. We would like to upgrade our tooling to better meet current demands.

Benefits of Proposal:

Students from all engineering disciplines will benefit from a better-equipped student shop. More courses are requiring hands-on projects and we need to upgrade and replace some existing tools to meet the needs of our students.

Cost Breakdown:

1 - 790 Cedarberg Mini Taper	$ 377.69	
2 – Delta Roller Stands	137.84	
1 – ½ ∅ Boring Bar Set (4 pieces)	130.50	
1 – ¾ ∅ Boring Bar Set (8 pieces)	337.43	
30 - Carbide Inserts (for above Boring Bars)	218.40	
30 - Carbide Part off Inserts	143.70	
10 - Carbide Milling Inserts	48.70	
1 – Set Master Jaws for 8" – 3 Jaw Lathe Chuck	110.18	
1 – Set Hard Reversible Jaws (for above Chuck)	91.05	
1 – Set of Counter Bores (9 pieces)	131.50	
Sub Total		
$1,726.99		
PST		138.15
GST		120.88
		$1986.02

Implementation Schedule:

Summer/99

Total Amount Requested = $1,986.02

Proposal #29:

Memory Upgrades for Engineering Computing Labs

Submitted by:
Beth Jewkes
Department of Engineering Computing
e-mail: emjewkes@engmail.uwaterloo.ca
Phone: (519)-888-4601
Position: Associate Dean for Engineering Computing

Description of Proposal:
Engineering Computing is an academic-support department within the Faculty of Engineering which provides leadership in the development and support of the Waterloo Polaris environment and the faculty computing communications network. It also manages and supports general purpose computing labs for academic use within the faculty and a number of servers that provide faculty-wide web and e-mail services to undergraduate students.

The focus of this proposal is to upgrade memory on the PCs in Engineering Computing managed labs: GAFF, Helix, Wedge, Lever and Wheel, a total of 114 machines.

Currently, the PCs in these rooms are Pentium-class PCs with processors of speeds ranging from 100MHz to 166MHz and 32MB of RAM. Most of the machines were purchased in early 1997 and are now 2 1/2 years old. They have been running Windows 95 since Fall 1997. The faculty plans to run Windows 95 until Windows 2000 is released and stable, probably 1 1/2 years from now. At that time, we expect to carry out major equipment upgrades which will be staged over approximately one year. CPU and motherboard upgrades between now and then are possible, but without large changes in the software we are running, may be excessively expensive for the faculty.

To increase speed and reliability, and to get additional life out of our current equipment investment, this proposal requests WEEFs assistance in upgrading the memory in Gaff, Helix, Shim, Wedge, Lever and Wheel to 64MB RAM from 32 MB Additional memory has been shown to reduce the frequency of system crashes and to improve speed without major investments in new CPUs and motherboards. This may prove particularly valuable in light of the fact we have recently upgraded AutoCAD from version 12 to version 14 (which requires a minimum of 32 MB RAM).

Proposal Benefits:
The benefits of this proposal accrue to all users of Engineering Computing labs:
- increased speed
- improved performance
- lengthening the life of our current equipment.

Cost Breakdown:
The request to WEEF is for 1/2 the cost of the upgrade. Engineering Computing will match this amount.

Description	Quantity	Price/unit	Total	Total with 10.3% Taxes
Upgrade to 64MB RAM (2 x 16 M SIM modules)	114	$78	$8,892	$9,808
Contribution from Engineering Computing:				$4,904
Request for funding from WEEF				***$4,904***

Implementation Schedule:

Once approved, the RAM can be purchased and installed within a month, preferably before the start of the fall term.

Total Amount Requested: $4904.00

Student Teams

Proposal #30:

University of Waterloo Alternative Fuels Team (UWAFT)

Submitted By:

David Mather
E-mail: dwmather@engmail.uwaterloo.ca
Phone Number: univ. ext. 3885
Position: Team Leader

Description of Proposal:

Test Equipment:

TechView for Windows - Software and interface cabling to allow downloading of test data from the team's 5-gas analyser to a PC. The gas analyser provides an instantaneous readout of the composition of an exhaust gas stream (ppm hydrocarbons, percent carbon monoxide, percent carbon dioxide, percent oxygen, ppm nitrogen oxides).

PICO TC-08 - An 8-channel thermocouple reader with data logging software. This unit allows monitoring and recording of 8 temperature measurement points using a PC It is compatible with all popular thermocouple types and includes cold-junction compensation.

Garage Tools:

2 Garage Creepers – Garage creepers are used to allow team members to roll beneath the vehicle while on their backs in order to perform work on the underbody of the vehicle.

Proposal Benefits:

TechView for Windows

This software will upgrade our emissions data collection and analysing capabilities. Currently, recorded data must be manually transferred (one measurement at a time) from the gas analyser to a PC spreadsheet. This can be a very time consuming process because the analyser provides five measurements per second. tests typically last two to five minutes. and a typical testing series may involve ten tests. This is a total of 15,000 measurements! Manually transferring this data is a very slow process and result in errors. Currently, the emissions testing equipment is used by both UWAFT and the Supermileage (Northern Camel) team.

PICO TC-08

This equipment is needed to improve our ability to analyze the thermal aspects of vehicle operation and optimize its performance. The team currently does not have any equipment that can be used to collect temperature measurements for multiple simultaneous data points. This unit is very small and is portable so that it can be placed inside the vehicle and used to monitor and record temperatures while the vehicle is being driven. The ability to analyse temperature data is crucial to the optimization of our emissions and cold-starting strategies.

Garage Creepers

These items are needed to improve the ease and safety with which team members can perform work on the underside of the vehicle. Currently, team members must slide on their backs to work beneath the vehicle.

Cost Breakdown:

These items can be purchased separately if needed. but all are important to the team's success.

Description	Cost
TechView for Windows	$860
PICO TC-08	$550
2 Garage Creepers	$120
Total Request	**$1530**

Implementation Schedule:

These items will be put into use as soon as they are received.

Additional Information:

UWAFT is a student project team open to students from all departments. Each year the team participates in an Alternative Fuels Competition. We are the only Canadian university involved in these competitions. For our last competition, the 1999 Ethanol Vehicle Challenge, the team consisted of 18 members from the Mechanical, Electrical, and Computer Engineering departments. At this competition, the team finished in fourth place overall (out of fourteen entrants) and won awards for the Best Design Presentation and Lowest Engine-Out Emissions. We are currently preparing for the 2000 Ethanol Vehicle Challenge which will be held in different locations across southern Ontario. This is the first time this competition has been held in Canada and is a strong motivator for the team to perform well. Vehicle testing is the activity which we have found to benefit us the most. The equipment that we are requesting funding for are important tools for ensuring our success at our next competition.

Total Amount Requested: $1530.00

Proposal #31:

Team Advancement For The Formula SAE Project

Submitted By: Formula SAE Team 2000
Jonathan Hook, Jeremy Schmidt
E-mail: jbhook@uwaterloo.ca, jdschmid@uwaterloo.ca
Phone Number: x5904
Position: Formula SAE Team 2000 co-leaders

Description of Proposal:

Computer System – purchase of new PC computer system: PIII 450 MHz,
15" monitor
8.4 GB HD
64 MB Ram

Data Acquisition Cables – purchase of 12 cables for interface with data acquisition computer.

Honda CBR600 F2 Motorcycle Engine – purchase of used engine for competition.

Racing Suits – purchase of 2 fire retardant racing suits (2 different sizes).

Tools – purchase of air and hand tools for construction of car: Air Ratchet
Impact Wrench
Pneumatic Cut-off Tool

Assortment of Files

Traffic Cones – purchase of 50 6" traffic cones for driver training.

Proposal Benefits:

Computer System – Computer will replace team's current 486 computer. The new computer will be used extensively for design and analysis as well as serve the everyday computing needs of the team. Much of the software to be used for future designs will not run on the current team computer.
Data Acquisition Cables – The data acquisition cables will allow for permanent instrumentation of the car allowing for greater flexibility in testing and design analysis. Future teams will benefit from the ability to conduct more extensive testing than past teams have been able achieve.
Honda CBR600 F2 Motorcycle Engine – The engine is an essential part of any car. This engine will serve the team in a number of ways. It will be the race engine for the 2000 competition. Its purchase will allow for more extensive testing to be conducted on the team's current backup engine and allow the 1999 car to remain in complete road-going condition for testing and driver training by future teams.
Racing Suits – Fire retardant suits are required for the FSAE competition. The team's current suits are a number of years old and are showing signs of wear rendering them unsuitable for competition. Two suits of different sizes are required so that team members will be able to train and compete safely.
Tools – The tools are required for more efficient construction of the car. The recent addition of an air line to the FSAE room allows for the use of the air tools. The files and pneumatic cut-off tool will prove especially useful during the construction of the tube frame chassis. The files will augment the team's current inventory of files, many of which are worn or broken after years of use and need to be replaced.
Traffic Cones – The purchase of these cones would supplement the team's current inventory of traffic cones, many of which are in need of immediate replacement. The cones prove invaluable for driver training. Dynamic events at the FSAE competition account for the majority of the points, therefore the improvement of driving skills are essential.

Cost Breakdown:

Computer System: $1800.00

Data Acquisition Cables (12)		$572.00
Honda CBR600 F2 Motorcycle Engine		$1400.00
Racing Suit (M)		
Suit	$304.95	
Gloves		$74.95
Shoes		$149.95
Arm Restraints		$39.95
Racing Suit (L) (as above)		$569.80
Tools		
Air Ratchet		$64.99
Impact Wrench		$84.99
Pneumatic Cut-off Tool		$84.99
Assortment of Files ($15 ea. avg.)		$100.00
Traffic Cones (50)		$200.00
	Total:	$5446.57

Implementation Schedule:
The items listed above would be purchased as soon as possible. Each item would have an immediate positive impact on the 2000 FSAE team as well as future teams.
Additional Information:

Total Amount Requested: $5446.57

Proposal #32:

GNCTR 2000 TEAM

Submitted By: GNCTR 2000 Team, Stone Cold
Stacey Condie
E-mail: secondie@engmail.uwaterloo.ca
Phone Number: 883-0910
Position: Finance & Fundraising Executive

Description of Proposal:
The Stone Cold Team would like WEEF's support in order to attend the 2000 Great Northern Concrete Toboggan Race in Regina. The Stone Cold Team would like WEEF to donate money to aid in the transportation of our team to and from Regina

Proposal Benefits:
The Stone Cold Team will be representing the University of Waterloo for the 2000 Great Northern Concrete Toboggan Race in Regina. This race displays the skill, ingenuity and resourcefulness of engineering students. This competition allows the UW fourth year Civil class to apply acquired knowledge in the areas of design, analysis, report writing, and marketing. It is without doubt that the University of Waterloo has set a standard of excellence in all of its endeavors. It is our hope that the Stone Cold Team's relentless effort and dedication will once again see us to the top of the coming year's competition.

Cost Breakdown:
The cost of a return flight to Regina (leaving from Toronto) is $384.13 per person, as quoted from Travel Cuts. Our team is requesting from WEEF a donation of $2688.91 in order to send 7 people from our team to the Races. We are attempting to send a total of 29 engineering students to this competition.

Implementation Schedule:
The Great Northern Concrete Toboggan Race in Regina is being held February 2-6, 2000.

Additional Information:
In return for your support, the Stone Cold Team has developed a number of ways in which we would be able to provide exposure for WEEF. They are as follows:
Proudly displaying the WEEF logo on the team uniforms and/or toboggan
Representation at the technical exposition kiosk in Regina
Including the WEEF logo and profile on our future Website
We thank you for your active interest in our team.

Total Amount Requested: $2688.91

Proposal #33:

Midnight Sun VI Solar Car Project

Submitted By:
Lukasz Pawlowski
E-mail: lwpawlow@uwaterloo.ca, mail@midsun.uwaterloo.ca
Phone Number: 888-4567 x2978
Position:

Description of Proposal:

Having just completed Sunrayce 99, the Midnight Sun Team is in the process of recommencing its design cycle. The project operates on a two-year cycle between competitions. Currently, the team is laying the foundations of the next solar car team at UW -- Midnight Sun VI.

As a result of generous sponsorship, the Midnight Sun V team was able to purchase NiMH batteries for the 1999 vehicle. These batteries require to be maintained while not in use. For this purpose, Midnight Sun secured the loan of a battery charger unit (Power Supply) from Xantrex Technology Inc until the end of Sunrayce 99. At this point Midnight Sun is faced with the choice of either returning or purchasing this unit. Midnight Sun would like to propose that WEEF aid in the purchase of this battery charger. Midnight Sun has been unable to secure the donation of this or a similar battery charger from another source.

Since 1997, Midnight Sun has been working towards the development of a high efficiency motor controller for solar vehicles. This work, motivated by the loss of two motor controller units in Sunrayce 97, has been steadily progressing over the last 2 years and is now in prototyping. The goal of this endeavor is to enhance the knowledge of motor controller technology at UW and to provide a low cost, robust motor controller for future solar and electric vehicles produced at UW. Midnight Sun would like to propose that WEEF take an active role in supporting this R&D activity and aid in the cost of purchasing components required during prototyping of the motor controller.

Proposal Benefits:

Midnight Sun is a multi-disciplinary project that engages over 100 students from across the UW campus -- some 80 from the Faculty of Engineering. The team teaches engineering principles and practices in a controlled environment where students are exposed to both the challenges of an engineering project and the rigors of business realities.

Goals of Midnight Sun VI:

- To extend, build, and race a winning solar car for Sunrayce 2001.
- To develop an interdisciplinary engineering project that promotes education through applied engineering experiences.
- To represent Waterloo Engineering through exposure of the project at races, trade shows, and media events.

Students who are working on this project must develop manufacturing techniques and quality assurance systems in order to produce a winning design. Students also benefit through working with our industry contacts as well as with other groups within the project.

Cost Breakdown: (in CND $, including all taxes and shipping costs)

Plan A	**Total: $5,000.00**
Xantrex XKW 80-37 Power Supply	$4,200.00
Motor Controller R&D	$800.00

Plan B	**Total: $4,200.00**
Xantrex XKW 80-37 Power Supply	$4,200.00

Any funding that WEEF can make towards these funding objectives will be very much appreciated.

Implementation Schedule:

As soon as funding for these items becomes available, they will be purchased immediately.

Additional Information:

Midnight Sun would like to sincerely thank WEEF for its continuing support. Thanks in part to WEEF's prominent position as a **Silver Sponsor** of Midnight Sun V, the team was able to secure our second consecutive Top Ten finish in Sunrayce. The funding that WEEF provided to help purchase crucial items such as solar cells was essential to the success of the team. Midnight Sun hopes that WEEF will continue to exercise its interest in this and other student projects at UW.

Total Amount Requested: $5,000

Proposal #34:

New Macintosh for the Iron Warrior

Submitted By:

Ryan Bayne
E-mail: rmbayne@engmail.uwaterloo.ca
Phone Number: (519)581-1358
Position: Assistant Editor – Iron Warrior

Description of Proposal:

A new Macintosh computer is required for the Iron Warrior student newspaper. Depending on the decision of the WEEF Funding Council, either a new Power Macintosh G3, or an iMac is requested. This computer would be used to design and produce the Iron Warrior before sending it to be printed. Currently this term, production has been done on the editor's own Windows based machine, but in the publishing world, Macintosh computers are preferred. Also, the software currently used should be upgraded, as some of our current programs are out of date by a number of revisions, and we are at danger of not being able to read files from outside sources.

Software that we would need includes an upgrade to QuarkXPress 4.0, an upgrade to Adobe PhotoShop 5.0 and a copy of Microsoft Office 98 for Macintosh. QuarkXPress is used for the actual layout of the newspaper. Adobe PhotoShop is required for photo editing and retouching, as part of the design process. Finally, Microsoft Office is required in order to read submissions from contributors and for administrative tasks.

Both computers should satisfy our needs, but there are advantages and disadvantages to both systems. The Power Macintosh G3 is more expensive than the iMac, but it is more powerful and expandable. It is possible to order a Power Macintosh G3 with a built in SCSI controller for the existing scanner, and it is easier to expand with an internal removable media solution such as a CD-R drive or a ZIP drive. We would likely use the existing monitor belonging to the current computer, but this would make the current computer useless for simple tasks.

The iMac would be cheaper, and includes a monitor, however, more external devices are required. An adapter to use the existing printer, and scanner are required, an external disk drive would cost more than an internal drive and a USB hub would be required as well.

Proposal Benefits:

The computer will allow for production to be returned to the Iron Warrior office on campus. Currently, since production is being performed on the publisher's own computer, not as many students have been able to assist in the publishing of each issue. Also, the current Macintosh is running out of disk space, and our removable Syquest drive is unreliable, and due to Syquest going bankrupt, it is difficult to purchase new disks. With a new Macintosh, it will be possible to run current versions of applications at a reasonable speed, as current work on the existing computer runs quite slowly

Cost Breakdown:

Power Macintosh G3 Proposal

Power Macintosh G3	$2350
Adaptec PowerDomain 2930U Ultra SCSI	$145
Entrega 7-port USB hub	$189.95
Removable USB drive	Max of $549
USB to Serial Adapter	$79US -> approx. $116 can
Adobe PhotoShop 5.0	$369
Microsoft Office 98	$249
QuarkXPress 4.0	$350US -> approx $515 can

TOTAL	$4482

IMac Proposal

iMac 333	$1849
Entrega 7-port USB hub	$189.95
Removable USB drive	Max of $549
USB to Serial Adapter	$116
USB to SCSI Adapter	$109
Adobe PhotoShop 5.0	$369
Microsoft Office 98	$249
QuarkXPress 4.0	$515 can
TOTAL	3946

Implementation Schedule:
As soon as possible

Additional Information:
Some of these numbers are subject to change due to the variable pricing of computer hardware and software.

Total Amount Requested: $8428.00

Proposal #35:

University of Waterloo Aerial Robotics Group

Submitted By:

Chris McKillop
cdmckill@warg.uwaterloo.ca
x5109

Background:

The Waterloo Aerial Robotics Group (WARG) was founded in 1997 with the purpose of entering the Association for Unmanned Vehicle Systems' International Aerial Robotics Competition. Since then, we have been working closely with the E&CE and Systems Design Department to provide 499 and workshop projects, as well as graduate research opportunities, to engineering students. Our current research is focused on the Millennial Event, the culmination of a three-year international competition. For this event, we are adding to our team of autonomous aerial and ground robots, and perfecting our existing mechanical design, electrical and software systems. In the second qualifier, held in July, we finished a close third place and won several awards that recognized our innovative design and professional execution. We intend to win the final event with our team of helicopters, ground vehicles and hovercraft.

Proposal Benefits:

WARG is a student-directed group with close ties to industry and faculty. As such, we are providing engineering students with exposure to cutting-edge technology, industry contacts and practical design experience. We are in the process of integrating our research with the new fourth year design requirements, and are already involved in 499 projects and Systems workshops. Given proper support, WARG will continue to spread Waterloo's reputation as one of top engineering schools in the world.

Cost Breakdown:

Helicopter Upgrades: $4000
-New tail rotor assembly
-Larger main rotor blades
-New tail boom
-Electronics pod redesign
-For two helicopters

Batteries: $1500
-Custom NiMH battery packs.

NiMH Battery Chargers: $200

Portable Honda Generator: $1200
-Used when testing in the field.

Electronic Design Software: $1000
-Used for PCB designs.

Funding Options:

Option 1: Everything	$7900
Option 2: Upgrades, Batteries, Generator	$6700
Option 3: Upgrades, Batteries	$5500
Option 4: Upgrades	$4000
Option 5: Batteries, Generator, Charger	$2900

Implementation Schedule:

Now that we are back from the 2nd qualifier we are looking to plan out the next year to be as efficient with our time as possible placing a great deal of emphasis on system reliability and pushing forward the start-of-the-art by designing new hardware and software systems tailored to this project.

Total Amount Requested: $7900.00