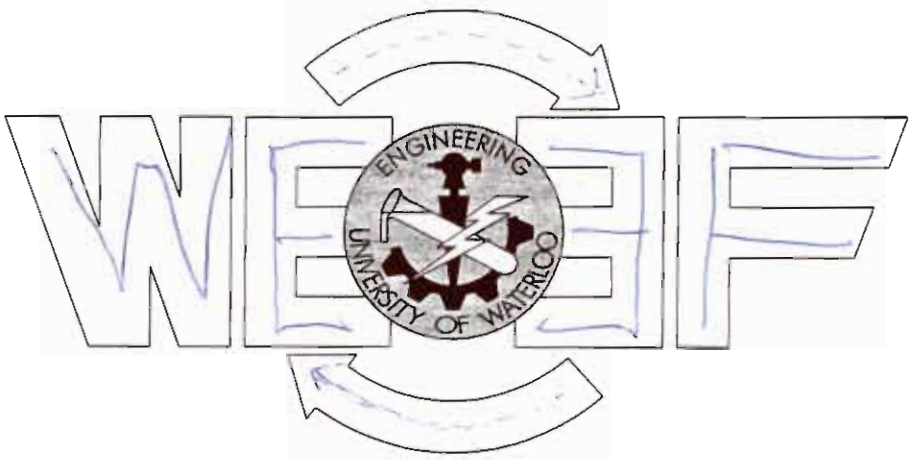
Waterloo Engineering Endowment Fund



Winter 1999 Proposals

Funding Council Meeting
CPH 4335
Tuesday
5:00 PM.

Table of Contents

WEEF Proposals - Winter 1999

	CHEMICAL	
1	Conductivity meters and spectrophotometers	$9,830.00
	CIVIL	
2	WEEF Proposal for Civil Engineering, 4th Year Study Room Monitors	$614.00
3	Visual Presenter for Projection System in CPH-3385	$2,168.46
4	Upgrade WATSTAR Undergraduate Computer Lab Equipment Department of Civil Engineering	$4,560.00
5	AutoCad Licenses	$2,500.00
	ELECTRICAL AND COMPUTER	
6	Computer Chairs for the Sunee Room	$2,880.00
7	E&CE Digital Lab Power Supplies	$2,625.00
8	E&CE Digital Lab Computer Memory Upgrade	$4,350.00
9	E&CE 4th Year Room Computer Usability Upgrade	$1,625.00
10	E&CE Public Computer Room Monitor Upgrade	$5,520.00
11	Portable Computer Enhanced Projection System	$7,300.00
	ENVIRONMENTAL	
12	HACH Spectrophotometers	$9,538.55
	MECHANICAL	
13	Polaris Networking	$1,054.00
14	Pentium Computers for Design Studio	$11,352.00
15	LECO MHT 200 Vickers Microhardness Tester	$16,400.00
16	Calibration Standards	$4,500.00
	SYSTEMS DESIGN	
17	Undergraduate Multimedia Lab Equipment	$2,681.60
18	Bench Power Supplies for Workshop Lab	$4,842.17
19	Laptop for Systems Design Department	$2,990.00
	MISC	
20	Equipment for Student Shop	$3,008.08
21	Faculty-wide Server for General Purpose Waterloo Polaris and Unix File Serving	$20,000.00
	Sub-Total Departmental	**$120,338.86**
	STUDENT	
22	University of Waterloo Alternative Fuels Team	$5,178.00
23	Engineering Students Societies Council of Ontario Annual General Meeting (ESSCO AGM) 1999	$800.00
24	End-effector construction for WATFLEX	$1,460.00
25	Team Advancement For The Formula SAE Project	$8,800.00
26	Midnight Sun V Solar Car Project Request for Funding	$7,304.30
27	Computer Upgrade for IEEE McNaughton Centre	$6,400.00
28	"Northern Camel" Supermileage Vehicle	$500.00
29	UW CASI Free Flight Glider Team 1999	$1,208.00
30	University of Waterloo Aerial Robotics Group	$6,200.00
31	Antenna and Triplexer	$678.50
	Sub-Total Student Groups	**$38,528.80**
	TOTAL	**$158,867.66**

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1. Conductivity meters and spectrophotometers

Submitted By:

Your Name: Siva Ganeshalingam
E-mail: Sganesh@engmail.Uwaterloo.Ca
Phone Number: 6161
Position: Senior Technician

Description of Proposal:

(1) Conductivity meters

Conductivity meters are currently used in our Undergraduate Laboratories

(a) To determine the end point in Conductometric Titrations by 3B students (038).
(b) To determine the salt concentration in Reverse Osmosis experiment by 4A students (040).
(c) Also used in monitoring the reaction in a new experiment by 1B students (101)

The existing meters are very old and at times doesn't function properly.

(2) Spectrophotometers

These are generally used in the Labs for quantitative analysis. In our lab two of these instruments are used to monitor the reaction between crystal violet and sodium hydroxide by 4A students. This is a whole day laboratory course (040) and both the instruments, currently in use, malfunction occasionally frustrating the students. These need to be replaced.

(3) Dispensors

Dispensors are needed to transfer concentrated acids safely in the Physical Chemistry Laboratory. Concentrated hydrochloric and sulphuric acids are used in some experiments. Students use pipettes and measuring cylinders to transfer them and occasionally end up burning their hands and spoiling their clothes.

Proposal Benefits:

(1) New conductivity meters and spectrophotometers will definitely facilitate the students to get better results.
(2) These new meters may be hooked on to computers in the future for better data processing.
(3) Since they are used for different experiments, many students will benefit.
(4) Dispensors are essential for personal safety.

Cost Breakdown:

Conductivity meters: $1008-90 each
Conductivity probe: $ 363-20 each
Subtotal: $ 1372-10
For two units: 2* 1372-10: $ 2744-20
Taxes @ 15% : $ 411.63

TOTAL: $ 3155-83

Spectrophotometer: $ 2450 each

For two units: $ 4900
Taxes @ 15%: $ 735
TOTAL: $ 5635

Dipensors: $ 452.25 each
For two units: $ 904.50
Taxes @ 15%: $ 135.68
TOTAL: $ 1040.20

TOTAL AMOUNT REQUESTED: $ 9830

Implementation Schedule:

As soon as possible

Additional Information:

2. WEEF Proposal for Civil Engineering, 4th Year Study Room Monitors

Submitted By:

Your Name: Erinn Bean
E-Mail: elebean@engmail
Phone Number: 883-0950
Position: 4th year undergraduate civil engineering student

Description of Proposal:

Replace two (2) out-of-date 15" monitors in the civil engineering 4th year study room in E2 with ADI-4P 15" monitors from Group 4. Ralph Korchensky, the computer hardware technician has recommended this replacement.

Proposal Benefits:

Over 90 students use the two (2) computers each term. (4th year civil engineering class is 90 +). Computers are used by 4th year students to complete assignments in the study room. Students often prefer to use these computers because the room is quiet and group work can be discussed easily.

Cost Breakdown:

ADI-4P 15" Monitor @ $279 + 10% tax = $307 each
Total = $614

2/3 partial funding. 1/3 from civil depart.

Implementation Schedule:

If funding is approved monitors will be purchased immediately. Installation will be as soon as the monitors are delivered. (Estimation 2-3 days)

Additional Information:

The two (2) computer systems were originally purchased with money funded by WEEF. Presently, we have one (1) repaired original monitor and one (1) loaner monitor in the 4th year study room.

3. Visual Presenter for Projection System in CPH-3385

Submitted By:

Prof. Wayne Brodland
brodland@sparky
x6211
Professor of Civil Engineering

Colin Campbell
campbell@ist
x5327
Scientific Computing Consultant, IST

Description of Proposal:

As a result of a significant initiative by WEEF, Civil Engineering and Mechanical Engineering, a video/computer console and projection system is being installed in CPH-3385. The system consists of a computer, video/data projector, amplified speaker, and VCR.

The console of the system was designed to accommodate a Visual Presenter, the subject of this proposal. A visual presenter consists of a self-enclosed lighting system and video camera, and is designed to take live pictures of course notes, textbooks, overhead transparencies, 35mm slides, and 3-D objects, and to feed these pictures to a video projector like the one just installed.

Proposal Benefits:

CPH-3385 is used for many core Civil, Environmental and Geological Engineering courses, and is also used from time to time by Mechanical Engineering. There is often a significant pedagogical benefit to projecting course notes, textbook illustrations, and other graphics in this room. These can be imaged using either a document camera or a visual presenter. In this application, we found that a visual presenter is more versatile and effective. The presenter also allows transparencies and small-scale specimens to be imaged and projected. It will be used both for classroom teaching and student presentations.

We investigated a number of alternatives, and found the Elmo EV-500AF to be the best choice from several perspectives. It can project either opaque or transparent originals due to the dual lighting system consisting of two adjustable, high-power side lights and a back lit panel. It has outstanding zoom capability allowing originals ranging in size from 35mm (1.5 in) to 280mm (11 in) to be imaged.

The image quality is superb, and we found the device straightforward to use. Use is simplified by automated focus, white balance and iris control (manual over-ride is provided). This device is a popular unit at UW, U Guelph and WLU, and faculty members and students find it both easy to use and effective.

Despite these advanced features, the unit is quite economically priced, and our supplier is willing to provide the unit based on a 1998 promotional price.

Cost Breakdown:

Visual Presenter *(Elmo EV-500AF/ 10x zoom/ Auto focus/ Dual lighting systems)*	**$ 3,925.00**
Taxes on the above *(GST 2.31% + PST 8%)*	411.92
Total	**$4,336.92**
Less 1/4 from Civil Engineering	-1,084.23
Less 1/4 from Mechanical Engineering	-1,084.23
Balance requested from WEEF	**$2168.46** *

Implementation Schedule:
Purchase and install immediately upon receipt of funding.

used by Mechanical and Civil Departments

*need projector which is currently installed (or going to be installed) in 3385 — already have. # for this.

4. Upgrade WATSTAR Undergraduate Computer Lab Equipment Department of Civil Engineering

Submitted By:

Ralph Korchensky, Computer Hardware Technologist,
Civil Engineering
E-MAIL: rkorchensky@uwaterloo.ca
PHONE: EXT. 5045

Description Of Proposal:

Install 100MB disk drives in 38 WATSTAR computers in the Civil Engineering WATSTAR lab E2-2340.

Benefits Of Proposal:

This would allow each Civil student to store all their term data on one disk or they could use this as a back-up disk for all of their files.
(All Civil Undergraduates would benefit)

Cost Breakdown:

I should be able to purchase in bulk (38 units) for a cost of $120 each. This equates to 38 x $120 = $4,560 plus applicable taxes.

Implementation Schedule:

Immediately, upon receipt of drives.

Additional Information:

The cost breakdown for the drives is as follows:

1-19 units = $139 each
20-39 units = $126 each
40 plus units = $120 each.

Should you require any further information, please contact me at ext. 5045.

Thank you,

Ralph Korchensky

5. AutoCad Licenses

Submitted By:

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

Description of Proposal:

Purchase and install licenses for AutoCAD v14

Proposal Benefits:

Students will have access to AutoCAD v14 for course and project work

Cost Breakdown:

$2,500

Implementation Schedule:

Immediate

6. Computer Chairs for the Sunee Room

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

Total: $2880.

Partial Funding options:

6 of each, total: $1920.

3 of each, total $960.

Implementation Schedule:

As soon as possible.

7. E&CE Digital Lab Power Supplies

Submitted By:

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

Description of Proposal:

Replace power supplies for single board computers in the E&CE digital labs.
The current power supplies are failing and are not repairable.

Proposal Benefits:

Used by E&CE 222, E&CE 324 (E&CE and Mechatronics), E&CE 354, E&CE 223
Ie all **2nd and 3rd year E&CE digital labs.**
The power supplies provide +5V and +/- 12V for single board computers (Coldfire, Intel 8096) as well as the E&CE 223 digital design boards and gate arrays (Xilinx FPGAs).

Cost Breakdown:

Construct 10 to 15 units at $175 each.
15 units at $175 = $2625

minimum 5

Implementation Schedule:

Purchase components in Summer 1999 and construct the power supplies during the summer for use in Fall 1999.

Additional Information:

Any number of units from 1 to 15 is acceptable.
A prototype is currently being tested.

no funding from departments

Importance Rating

- ● Very Important
- ○ Necessary
- ○ Helpful

These are necessary for the operation of the labs.

full - 1/2 - 1/4

8. E&CE Digital Lab Computer Memory Upgrade

Submitted By:

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

Description of Proposal:

Upgrade the new AMD K6-2/333 computers in E2-2363 from 32M to 96M of RAM.
The E&CE Department has upgraded the AMD computers in E2-2356.

Proposal Benefits:

We are upgrading the software used in E&CE 223, E&CE 324 (used by both E&CE & Mech. Students). This software (Xilinx Foundation, Altera MaxPlus or Cypress Warp) will also be used for the 4th year E&CE design project (a new degree requirement).
The new software, and larger programmable gate arrays, require much more memory. 32M has proven insufficient in tests although we are not exactly sure of the memory required.
Since 5 computers in the E2-2362 public computer room were upgraded to K6-2/333's and because they are also used by the students taking the E&CE digital courses I would also like to upgrade the RAM in them.

Cost Breakdown:

Upgrade 29 machines at $150.00 each = $4,350.00

Implementation Schedule:

Purchase and install as soon as we know the exact S/W requirements

Additional Information:

Any quantity upto 24 units will be put into the E2-2356 computers.
Any extra RAM, beyond the 24 units, will be used to upgrade the new computers in the public computer room, E2-2362.
Note: Older computers such as the P133 and P200MMX in the public computer room and the E2-2356 are not being considered for upgrading since they are limited to 64M of RAM.

Importance Rating

- ● Very Important
- ○ Necessary
- ○ Helpful

These are necessary for the operation of the labs as we move to memory hungry Win 95 software.

9. E&CE 4th Year Room Computer Usability Upgrade

Submitted By:

Your Name: Bidemi Temidire
E-mail: brtemidi@engmail
Phone Number: 725-4161
Position: Student (4th year Comp. Eng.)

Description of Proposal:

The keyboards of the computers in the 4th year E&CE room sit at the edge of the desk and provide no wrist support for typing. This makes the computers awkward and painful to use for any length of time.

The chairs are the plastic bucket variety and do not allow for good body posture while typing.

Proposal Benefits:

This will improve comfort while typing and reduce the chance of repetitive strain disorders.

The fabric chairs have a height adjustment that allows each user to customize the chair and backrest height The desks have a keyboard tray (adjustable height) and are deep enough to hold everything.

Cost Breakdown:

30" x 60" desk is $180.00 each [Same desks as used in the E2-2364 lab]
fabric chairs are $145.00 each [Same chairs as used in the E2-2364 lab – minus the arms]

5 tables + 5 chairs = $1,625

Implementation Schedule:

All equipment will be installed as soon as it is received (approx. 2 weeks after purchase).

Additional Information:

Funding for any number of chairs and tables upto 5 is acceptable.

Importance Rating

○ Very Important
○ Necessary
● Helpful

These are necessary for user comfort.

10. E&CE Public Computer Room Monitor Upgrade

Submitted By:

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

Description of Proposal:

Replacing twenty old 15" monitors with 17" ones more suitable to the CAD and Win 95 S/W being used. The old 15" monitors then trickle down to the E&CE 3rd and 4th year labs (E&CE 318 –communications in E2-3339, 48x - control theory in CPH-3371) to replace many of the 32 obsolete 14" interlaced monitors.

The E&CE Department has purchased 20 monitors already and 32 units need to be upgraded.

Proposal Benefits:

These computer rooms are used by all E&CE students and are available to anyone with a Polaris account. The old 14" monitors that would be upgraded make the pentium computers in the labs useless. Ie they barely work at 800 x 600 resolution.

Cost Breakdown:

Goldstar model LG760 SC, $460.00 each
Total cost for 12 units is 460 * 12 = $5,520

Implementation Schedule:

Purchase and install as soon as possible. Expected install date is very early in the summer 1999 term if not late in the Winter 1999 term.

Additional Information:

Any quantity from 1 to 12 units is acceptable.
The first 10 monitors purchased will go into the public computer rooms. Any extra funds would be used to replace 14" monitors in the labs mentioned above.

Importance Rating

- ● Very Important
- ○ Necessary
- ○ Helpful

These are necessary for the operation of the labs as we move to Win 95 software.

11. Portable Computer Enhanced Projection System

Submitted By: E&CE DEPARTMENT

Young C. Yoon, Assistant Professor
Phone: (519) 888-4567, ex. 3994, Office: DC 3619
Email: y.yoon@ece.uwaterloo.ca

C. Ed Spike, Laboratory Teaching Staff Member
Phone ex. 3716, Office: E2-3357
E-mail: Spike@engmail.uwaterloo.ca

Description of Proposal:

A portable computer display system for specific and for non-specific classroom demonstration is required. A computer and a large screen projector mounted on a cart would be used to demonstrate processes, to project short audio and visual sequences, and to project images. The projection system will be used to enhance the lecture presentation by providing information which can not be shown otherwise or which is difficult to present in another format. An optional network connection would benefit/enhance the needs of the individual user.

Proposal Benefits:

The system can be used in course lectures and course laboratories to support short presentation requirements and enhance the learning experience of the undergraduates. For example, the theoretical concepts of random variables, and random processes will be enhanced in courses involving statistics, and probability theory and practice. Design and modeling examples in short presentations will be introduced prior to more intense computer room use. Short animation items now being developed can be presented to re-enforce lecture and laboratory subject material.

Implementation Schedule:

Purchase can be made immediately upon receiving funding. We would like to install everything by May 01, 1999. However the system could be used this term since there are existing examples available for some of the material in the E&CE-316 course lectures and E&CE-318 course laboratory.

Additional Information:

Specific software will be the responsibility of the user.

Some E&CE courses targeted are; 241 lab, 342 lecture, 316 lecture, 318 lab, 370*, 471*, 473*, and 474* (* for lecture and laboratory use).

Development planning is on going for the "AVI" format demonstration material.

Enhanced presentation of the material in LabVIEW, MathCAD, MATLab, Pspice, CAD, and Eesof, can be done with audio and visual overlays. Some overlays can be done as "AVI's".
Digital camera images and digitized video (and audio) sequences can be brought to the classroom and laboratory in an efficient and timely manner.

The "show and tell" approach is primary for the use of this PORTABLE COMPUTER ENHANCED ROJECTION SYSTEM.

The following table shows the proposed budget.

E&CE Dept funds	**$7295.00**
WEEF request	**$7300.00**
TOTAL	**$14595.00**

Other departments within the Faculty of Engineering may wish to borrow the system as scheduled.

Cost Breakdown:

Computer: K6-2/250 ATX, 64mb, system ATI expert x1, dual CDrom, 6.3GHD, Keyboard, Mouse, Trinitron Monitor Network Card, WIN9x	$1830.00
Projection: Electrohome Data/Video Projector Model EPS1024Plus	$10990.00
Cart and Security Hardware:	$400.00
Sub TOTAL **Taxes 10.4 %** **TOTAL**	**$13220.00** **$1375.00** **$14595.00**

Any increase in the price will be picked up by the Department.

NEED ALMOST ALL OF THIS.

12. HACH Spectrophotometers

Submitted By:

Your Name: Tara Smook
E-mail: tmsmook@engmail
Phone Number: 883-8734
Position: Class Representative: 2A Enviro-civ

Description of Proposal:

Addition of three new HACH DR/2010 Spectrophotometers complete with 120 preprogrammed analytical water testing methods for use in the Laboratory or in the Field. Units are portable, battery or AC powered, and are, very quick and easy to operate and are rugged enough for field use. These would compliment the existing 4 units providing easier access during formal course laboratories and for project use in the laboratory or in the field.

Proposal Benefits:

The addition of these three units would reduce unnecessary waiting in Laboratory sessions in Env.E. 275, and in Env. E.330. They are also used in Civ.E. 375 and 472, Env.E. 331, 375 and 472 and for projects in Env.E. 126 and 330, where additional equipment of this nature is badly needed. Students taking courses and projects get hands-on, immediate results for important environmentally relevant parameters. Approximately 300 students in Civil and Environmental Engineering will use this equipment every year.

Cost Breakdown:

DR/2010 Spectrophotometer	$ 2738.93 ea.
Carrying Case	130.67 ea.
TOTAL with Tax (8% PST + ~2.8% GST) for 3 Units	**$ 9538.55**

Implementation Schedule:

Three courses are offered in the Spring'99 Term and would make immediate use of these new units.

Additional Information:

lifespan - 5 years
$1000 from department.

13. Polaris Networking

Submitted by:

M. Kaptein, Mechanical Engineering
e-mail: rkap@surya.uwaterloo.ca
Position: Lab Director, Mechanical Engineering

Description of Proposal:

Engineering Computing plans to discontinue support for the Proteon Pronet-10 ring network card as of May, 1999. All Polaris computers in Mechanical Engineering are using the Pronet card and need to be converted to an Ethernet system before this date.

Benefits of the Proposal:

Continued use of Polaris computers.

Cost Breakdown of Proposal:

18 network computer cards	$ 720.00
2 network server cards	80.00
Cable and connectors	150.00
Sub Total	$ 950.00
Total (Taxes Included)	**$1,054.00**

Implementation Schedule:

Spring 99

14. Pentium Computers for Design Studio

Submitted by:

M. Kaptein, Mechanical Engineering
e-mail: rkap@surya.uwaterloo.ca
Position: Lab Director, Mechanical Engineering

Description of Proposal:

Civil and Mechanical Engineering have developed a CAD Design Studio in E3, Room 1101. This studio is to support design courses and student projects by providing a controlled room with Cad facilities and a design environment.

We have 11 pentium computers for this room and would like to add 4 more computer systems to facilitate the use of IDEAS in this studio.

Benefits of the Proposal:

Single up-to-date CAD facility to assist students using Auto Cad and IDEAS, providing flexibility for students in specific courses and all 4th year students.

Cost Breakdown of Proposal

4 Pentium computer systems with 17" @ $2,838.00 each

Total Including Taxes $11,352.00

Implementation Schedule:

Summer/1999

15. LECO MHT 200 Vickers Microhardness Tester

Submitted by:

M. Kaptein, Mechanical Engineering
e-mail: rkap@surya.uwaterloo.ca
Position: Lab Director, Mechanical Engineering

Description of Proposal:

Our present Vickers microhardness tester is more than 30 years old. The light source and damping mechanism are faulty and the focal length continuously falls out of adjustment. This makes it impossible to view an indent made by the diamond indentor and therefore to measure hardness. This equipment is constantly used by undergraduate students in ME 435, ME 544, ME 534 and ME 531. It is continually breaking down causing delays and false readings for their projects. The new microhardness tester is a modern, robust, easy to use instrument which will be well suited to use by undergraduates and greatly enhance their education in materials testing and evaluation

also in some junior courses as exposure to equipment

Benefits of the Proposal:

To provide a current measurement apparatus for undergraduate students in above named courses.

Cost Breakdown of Proposal

LECO MHT 200 VICKERS MICROHARDNESS TESTER Mechanical Engineering will match WEEF contribution.	$16,400.00

— 1/2 $8200 not incl. tax.

Implementation Schedule:

Immediate

will last 30 yrs +

1/2 by depreciation

16. Calibration Standards

Submitted by:

M. Kaptein, Mechanical Engineering
e-mail: rkap@surya.uwaterloo.ca
Position: Lab Director, Mechanical Engineering

Description of Proposal:

Currently the materials group has no calibration standards for use with our JOEL 840 Scanning Electron Microscope (SEM). This means that we can not quantitatively determine the compositions of phases in various materials that the students are exposed to in ME 215 and ME 230. This limits our ability to introduce 1st and 2nd year students to the full capability of a SEM as a materials characterisation tool. In addition, the SEM is an important piece of equipment used by senior students to perform projects in ME 435, ME 531, ME 535, and ME 544. These projects would be greatly enhanced if the students could use the SEM as a quantitative tool for determining phase composition. Therefore, the purchase of a 36 element calibration standard would greatly enhance the educational experience of both our junior and senior students.

Benefits of the Proposal:

Quantitative measurements by all students in the above mentioned courses.

Cost Breakdown of Proposal

Calibration Standard	$4, 500.00

Implementation Schedule:

Immediate

17. Undergraduate Multimedia Lab Equipment

Submitted by:

Keith Parker
bkparker@engmail.uwaterloo.ca
(519) 746-8163
Position: Student, 3B Systems Design

Description of Proposal:

This proposal is for the purchase of a new computer specially outfitted for multimedia applications. It will be a valuable addition to the Systems Design Undergraduate Multimedia Lab.

Currently the lab has a couple of NeXT systems, a flatbed scanner, audio digitizer (mixing board), a VCR, and a television. All the equipment was state of the art when it was originally purchased, however that was nine years ago. Use of the equipment has dwindled dramatically in recent years since the features provided by the NeXT stations are nowhere near the capabilities of today's machines and the file formats are often incompatible as well.

A new computer outfitted with the accessories fitting of a multimedia station is all that is needed to bring the entire lab up-to-date. The proposal calls for a computer as follows: PII-400, 128M ram, DVD-player, CD-writer, 12.7 Gig Hard drive, AGP All-in-Wonder Video Card, 19-inch Monitor, and Adobe Premiere Software. The selection of these items was done with careful consideration of what the lab requires as well as the costs surrounding the purchase.

Benefits of the Proposal

This proposal will benefit undergraduate engineering several ways:

1. *Systems Design Students (all years, but mostly 1A, 3A, 3B, 4A, 4B)*
   - Workshop courses (361, 362, 461, 462 and also intro to systems, 161) all require fairly formal presentations. As well some workshop topics will require the preparation of fairly realistic simulations of the product or service the members are developing. This equipment will give all students access to professional level multimedia equipment that integrates sound, voice and video. In the past some students use their own computers to prepare such presentations, however not everyone has that luxury.
   - Personal Interest. In today's world having the skills to prepare multimedia presentations are extremely valuable. Students will have the ability to develop these skills by using this equipment.

2. *Student Projects*
   - This equipment will allow teams and individuals representing the university in external competitions to develop truly advanced and professional presentations. This will help in presentations made as part of the competitions, or as tools to assist in fundraising. Midnight Sun has used the equipment recently, and anyone is welcome to use it when required. This may be particularly useful for OEC entrants as well.

3. *Other Engineering Student*
   - Any student with the need or the interest can use the multimedia lab.

Cost Breakdown of Proposal

COMPUTER	
Intel Pentium II - 400 Mhz	
128 Meg SDRAM	
Hitachi DVD-2000 player	
HP 8100i CD Writer	
12.7 Gig Hard Drive	
ATI All-In-Wonder AGP Video Adapter w/ 8 Meg Ram	
Viewsonic PS790 19" FST Color Monitor	
SMC 9432TX Ethernet Card	
Keyboard	
Mouse	
1.44 Meg FDD	$3787.00
SOFTWARE	
Adobe Premier 5.1 Software	$469.00
(UW Computer Store)	
Other multimedia software available	
SubTotal	$4256.00
Tax	$ 425.60

TOTAL with Tax (1.10)
$4681.60

Subtract Partial Funding from Systems Department	**-$2000.00**
Total request for funding from WEEF	***$2681.60***
(ie. this is the partial funding amount)	

Implementation Schedule of Project

Immediately as soon as funding is awarded by funding council and approved by the Board of Directors.

Additional Information

Summary of WEEF funding Proposal

- This proposal is to seek funding for a new computer outfitted with various multimedia related accessories to once again bring multimedia lab to state of the art capabilities.

- The proposal is for a computer as follows: PII-400, 128M ram, DVD-player, CD-writer, 12.7 Gig Hard drive, AGP All-in-Wonder Video Card, 19-inch Monitor, and Adobe Premiere Software.

- The proposal will benefit students in the entire faculty, not just Systems Design students. It will be particularly useful to student projects representing Waterloo in the many engineering competitions held around the world.

- The total cost is $4682. The Systems Design department is willing to contribute $2000, thus leaving the partial funding option of $2682. This represents excellent value from WEEF's perspective, as the end product to the students is larger than its contribution alone represents.

18. Bench Power Supplies for Workshop Lab

Submitted By:

Tao Sang
tsang@engmail.uwaterloo.ca
2A Student, Systems Design

Loris Rossi
l2rossi@engmail.uwaterloo.ca
Technician, Systems Design

Kevin Krauel
kbkrauel@kingcong.uwaterloo.ca
Lab Director, Systems Design

Description of Proposal:

With financial support from WEEF, the Systems Design Department would like to purchase two 1 Kilo-Watt DC Power supplies for our Undergraduate Workshop Lab. We have selected two quality but cost-effective power supplies from a British Columbia company called Xantrex. The total cost of these units, including taxes, is about $4,853. We hope that WEEF would fund 75% of this purchase or $3,640. The Systems Design Department will fund the balance.

Proposal Benefits:

Since the proposed equipment is of high quality and fundamental to any electronics-oriented laboratory, it will provide a long term benefit to a significant number of our current and future undergraduate students. The equipment will remain useful for a long time.

The equipment to be purchased, will be available to all of our undergraduate students from first year through to fourth year, for workshop and/or group projects. Currently, the Systems Design department does not have high-wattage power supplies such as these for our students. However, there is a clear demand for such power supplies.

This purchase would reflect positively on WEEF, as the equipment will be used in high-profile projects which will help to maintain or enhance the awareness of WEEF.

Cost Breakdown:

XHR 40-25 (0 .. 40V, 0 .. 25A DC power supply)	$2,195.00
XHR 50-20 (0 .. 50V, 0 .. 20A DC power supply)	$2,195.00
Taxes (10.3%)	$ 452.17
Total	$4,842.17

** Funding request to WEEF ..... $3,631.63 (i.e. 75% of $4,842.17) **

Implementation Schedule:

These power supplies will be ordered as soon as funds are awarded by the Funding Council and approved by the Board of Directors. Once the equipment is received, the two power supplies will be immediately installed in the Systems Design undergraduate Workshop Lab.

Additional Information:

The power supplies are equipped with power factor correction (PFC), over-voltage protection (OVP) and current-limiting circuitry.

Summary of Important Points:

- Long lasting power suppliers
- Quality and cost-effective
- Currently don't exist, and very much needed
- Benefit to all students of Systems Design Department → equipment available in Mech & Elec. Dept.
- Positive Reflection on WEEF Title:

Mostly for 3rd or 4th yr. project.

poor in my evaluation.

19. Laptop for Systems Design Department

Submitted by:

Monica Milanowski, Undergrad Student
Email: mmilanow@engmail.uwaterloo.ca

Description

This proposal is for the purchase of an IBM Thinkpad 390, IBM part number 262650U.

Benefits of Proposal

Systems Design students have at least four project courses that are spread over the course of the undergraduate curriculum. Many of these projects involve the need for computing power at remote or changing locations. Currently, students borrow laptops from other projects, former employers or peers, but then can be limited to the times they can use the computer or what they can load onto the computer. It would be helpful to have a dedicated laptop in the systems design department that could be used for an extensive amount of time and customizable for the specific project on hand (i.e. by installing the software needed and being able to store the results in the same location until the project is complete). The laptop available through the Engineering Society office can only be signed out for a maximum of overnight, which is not enough time for many group projects.

Also, some of these projects are in partnership with local companies. Presentations or even progress meetings would be more professionally handled if a laptop was available for these purposes.

The laptop would be available to primarily all Systems Design students, and possibly students in other faculties if the need arises. For Systems students, the courses that would get the most benefit of the laptop are: SYDE 161, SYDE 361, STYDE 362, SYDE 461 and SYDE 462.

Cost Breakdown

Cost of laptop:	$2600
PST:	208
GST:	182
Total:	$2990

Implementation

This project would require a one time purchase of a laptop directly from IBM. The laptop will be kept in the Systems Design lab and will be administered by the lab technicians (currently Dave Walsh and Loris Rossi). Students will be able to sign out the laptop at their discretion.

Additional Information

Specifics of IBM Thinkpad 390, part number 262650U

IBM part number	262650U
Processor	PII 230MHz
Hard drive	3.2 GB
CD-ROM	24x
RAM	64-bit SDRAM
Modem	56K
Warranty	1 year (parts and labour)

20. Equipment 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 sheet metal, fabrication, drilling, tapping and assembly areas 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 - making it essential to have better and safer equipment available.

Cost Breakdown:

Roper Hand Held Piercing Kit and Mounting Base	$	414.70
Gauge Work Table and Cabinet Base for existing #218 Bench Piercing Unit		787.40
Lenox Hole Saw Kit		246.94
Lenox Vari Bit Kit		229.59
TPI Transfer Punch Set		93.12
8 - Sets Heiman Transfer Screws		219.78
2 - 6906 Wilton Machine Speed Clamps		111.70
Roper EZ Tapper		512.50
Sub Total	$	2,615.73
PST		209.25
GST		183.10
Total	**$**	**3,008.08**

Implementation Schedule

Winter/99

21. Faculty-wide Server for General Purpose Waterloo Polaris and Unix File Serving

Submitted by:

Name:	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:

The file server described in this proposal is part of a larger project called "Waterloo Polaris, Phase II" which is aimed at moving the "Watstar" server, the heart of Waterloo Polaris, to industry standards. More details on Phase II can be found at http://polaris.uwaterloo.ca/#phaseii . The focus of this proposal is user file serving - what is currently stored on the N: drive.

This proposal is being made on behalf of all all academic departments in the faculty.

Current file serving issues:

- **off campus access to user files on the Watstar server is cumbersome and very limited. This has been a longstanding and growing concern, especially now that residences are wired and many students have access to computers where they live.**
- **The static file storage used by Watstar is growing inefficient - it uses space allocated rather than space actually used.**
- **The current data backup system is written and supported by Engineering Computing due to the proprietary Watstar file structure. It is getting very cumbersome to manage.**
- **Hard drive crashes can take up to 1-2 days to resolve, sometimes more. The hard drive replacement and restore process can be stressful and time consuming for all and causes lost productive time for users.**

The proposal is to install a single, high performance, dedicated server for the faculty to provide user file storage for general purpose computing - Waterloo Polaris and general purpose Unix systems (engmail, novice, and www.eng). The server will consolidate file serving done currently by approximately 30 general purpose Wastar servers in the faculty.

The goals are to provide increased functionality and flexibility for our students, increased reliability, to simplify fault recovery and to use technology that is easily managed and scaleable.

Planning for the file server described in this proposal took place over the fall of 1998 and has been approved by the Academic Policy Committee of the faculty (Dean, Associate Deans and Departmental Chairs).

The general features and benefits of the proposed approach to file serving are described below:

- **A Common Home Directory for all general purpose files:**

All undergraduates have accounts on Waterloo Polaris and engmail and most have accounts on Novice and the faculty web server, www.eng. To promote ease of cross-platform access to files, and to increase students' ability to pool their quotas on several servers, a common home directory has been planned - i.e. a directory in which all general purpose files are stored.

A common home directory will be implemented in two steps. The first step will be Waterloo Polaris file serving; the second will be to merge general purpose Unix file serving with that of Waterloo Polaris thus achieving a common home directory.

- **Permanent File Storage:**

The file server will provide students with permanent file storage from 1A to 4B. This will greatly increase the ease with which students make the transition from workterm to school and vice-versa.

- **A New 20MB Quota for Waterloo Polaris.**

Stage 1 of the planned conversion includes a standard allocation of 20MB per student for Waterloo Polaris with greater allocations permitted for some students for projects and special courses (at a departments discretion). This increases useable space from 7MB to 17MB (There is a fixed 'overhead' of 3 MB for Windows 95 files which is unusable).

The second stage of implementation of the file server will see an additional allocation of 5MB per student when general purpose Unix file serving (www.eng, engmail and novice) quotas are merged with Waterloo Polaris file serving.

- **Remote Access:**

Once the file server is implemented, users will be able to access their files from on and off campus, via FTP or SMB protocols.

- **RAID fault tolerance:**

The file server provides redundant hard disks so that a disk failure will cause not data loss. A replacement disk can be 'hot swapped' and repopulated automatically, without any apparent disruption for the users.

- **Backups:**

All backups for the new file server will be done using "*Hoover*", which is IST's *Legato* tape backup system (see http://www.ist.uwaterloo.ca/ps/servbackup.html) . Hoover provides automated restores.

The proposed file server:

The file server approved by the faculty is a Network Appliance F720 (see http://netapp.com for further details).

The specifications for the server are:

Vendor:	Network Appliance
Product:	F720 filer, 256Mb memory, 8MB nonvolatile RAM
	NFS, CIFS software for Unix and PC remote file access
Storage:	108 GB disk space

The Network Appliance is a high performance, dedicated file server that provides NFS (network file system) and CIFS (common Internet file system) remote file access protocols. This allows both Unix and PC clients to access files stored on the server, whether the clients are on campus or off campus.

The faculty of Mathematics has used a Network Appliance for the past 4 years for their undergraduate environment and it has been very successful.

One attractive feature unique to the Network Appliance file system is a feature called "**snapshots**". Snapshots are copies of the entire file system. They do not show up in directory listings, but are a special read-only directory. Users can recover the most recent version of files they may have accidentally deleted or removed by copying the read-only "snapshot" version of the file back into their current directory. Snapshots are thus akin to an "online backup". They do take up some administrative storage overhead, but are seen to be well worth it for user convenience. The experience in the Math faculty with the snapshot feature has been increased service for their users and a decline in the number of requests for restores.

Proposal Benefits:

The benefits of this proposal accrue to all undergraduates:

- a common home directory for all general purpose files
- permanent file storage from 1A to 4B
- enlarged standard quota of 20MB for Waterloo Polaris
- remote access to files - off campus, residences.
- RAID fault tolerance
- Automated backups and restores
- snapshots allow easy replacement of recently lost files
- consolidated management of file systems from multiple servers.

Cost Breakdown:

Vendor:	Network Appliance
Product:	F720 filer, 256Mb memory, 8MB nonvolatile RAM
	NFS, CIFS software for Unix and PC remote file access
Storage:	108 GB disk space

The total cost of the server listed above is $68,000 CAN, however further price reductions are likely through a negotiation process with the vendor.

This proposal is part of a campus-wide initiative to consolidate file serving. Each of the other faculties, IST and the Library are proposing to acquire a similarly configured Network Appliance

F720 and the IST backup system is to be enhanced to support the additional backup load. Estimated cost for the project is approximately $560- $600K, though a final price has yet to be negotiated with Network Appliance. Of this cost:

1) The faculties, IST and the Library (in equal shares) have committed $200,000.
2) A request for an additional $200,000 for this project has been submitted to the Vice-President Academic and Provost to match the faculty contributions. A decision is pending.
3) The remaining $160K to $200K is to be paid for by the respective organizational units. The expected cost for Engineering is $20K - $25K

The request for WEEF funding is $20,000.

Implementation Schedule:

Waterloo Polaris file serving on the Network Appliance is to be implemented over the spring, well in advance of September 1999. Specific cut-over dates for departments will be worked out with the systems administrators in the faculty during March, 1999.

Points to consider:

This proposal will make a dramatic change in the quality of file serving the faculty offers to its students. The benefits of this proposal accrue to all students:

- a common home directory for all general purpose files
- permanent file storage from 1A to 4B
- enlarged standard quota of 20MB for Waterloo Polaris
- remote access to files - off campus, residences.
- RAID fault tolerance
- Automated backups and restores
- 'snapshots' allow easy replacement of recently lost files
- Consolidated management of file systems from multiple servers.

The file server is a part of a strategic change in computing for the faculty, one which has been approved by all departmental Chairs, the Associate Deans and Dean. This is an excellent candidate for WEEF support, as it is an exciting and important part of the faculty computing infrastructure.

seems useful.

objectivity vs. subjectivity

22. University of Waterloo Alternative Fuels Team

Submitted By:

Your Name: Nicole Dufour,
E-mail: nedufour@engmail
Phone Number: extension 6208
Position: Team Leader, University of Waterloo Alternative Fuels Team

Description of Proposal:

The goal of this proposal is to gain funding for safety equipment required for our upcoming competition. We are also seeking funding for additional tools to add to our garage. The 1999 Ethanol Vehicle Challenge marks only UWAFT's third competition. In the past we have finished in first place in the 1997 Propane Vehicle Challenge and in second place in the 1998 Ethanol Vehicle Challenge. Owing to the relative youth of the team we still building the resources required to convert and optimize our alternative fuel vehicles. The following items are being requested as UWAFT does not have the funds required to purchase them in the current budget.

Proposal Benefits:

UWAFT consists of students from across the engineering disciplines. Currently 3rd and 4th year students from mechanical, electrical, systems design and chemical engineering are involved. Competing in the challenge provides the student team members with hands-on experience solving real-world automotive design problems and exposes them to the latest technology. This equipment is being requested so that we will be able to compete.

Cost Breakdown:

Safety Equipment Necessary for Competition
Firesuits: 2 * $2000.00 = $4000.00
Helmuts: 2 * $500.00 = $1000.00

Tools for Garage
Creepers: 2 * $46.00 = $92.00
Flaring Tool: $86.00

Total **$5178.00**

HAVE $7-8K OF OTHER EXPENSES

WILL TAKE ANY PORTION OF COSTS.

Implementation Schedule:

Safety Equipment Necessary for Competition

The requested safety equipment is to be utilized at the competition which takes place May 19th-May 26th 1999. It will not be possible to borrow this equipment from the FSAE team as their competition is at the same time. The equipment will also be needed during the pre-competition performance testing of our vehicle.

Tools for Garage

The requested tools will be put to use immediately upon procurement. These tools will be used by future teams as well.

23. Engineering Students Societies Council of Ontario Annual General Meeting (ESSCO AGM) 1999

→ PEO-STUDENT MEMBERSHIP
↳ IS THIS A GOOD IDEA?

Submitted By:

Your Name: Michael Hermann
E-mail: mhermann@engmail
Phone Number: 725-5305
Position: Co-Chair, ESSCO AGM 99

HOW WILL IT BENEFIT WATERLOO STUDENTS?

Description of Proposal:

This proposal is for operating funds for the hosting of the ESSCO AGM '99. This conference is held each year, and is the primary working conference for ESSCO. On June 4-6 it will be hosted here at the University of Waterloo by out Engineering Society. ESSCO, which can be best explained as the Engineering Society for all of Ontario, represents all 13 engineering schools in the province. ESSCO's mission statement, shown here, explains the primary purposes of ESSCO.

The ESSCO Mission Statement

- *The Engineering Student Societies Council of Ontario's mission is to promote unity and continuity among Ontario Engineering schools and increase the entire organization's visibility within the engineering profession.*
- *ESSCO shall take a professional and pro-active role in dealing with current social and political issues affecting member societies and their students.*
- *ESSCO will consider the position of government and the professional, academic and student sectors of Ontario engineering when confronting these issues.*
- *ESSCO is responsible for ensuring that the opinions of its members are presented in a clear and professional manner to the organization and outside bodies.*
- *ESSCO will serve to promote engineering as an exciting, challenging and equitable profession to all outside bodies, with an emphasis on elementary and high school students*

The University of Waterloo has a proud history of hosting conferences such as CCES 1996, OEC 1998, and GNCTR 1999. The ESSCO AGM 99 is the opportunity for Waterloo to maintain this reputation during a year when ESSCO is dealing with some of it's most important topics ever. Developments in the PEO Student Membership and ATOP situations will be of primary focus at this year's conference.

Proposal Benefits:

The University of Waterloo Engineering Society, and the faculty it represents, benefit directly from the work that ESSCO does, especially in the areas of ATOP and PEO Student Membership. ESSCO has taken a forefront in the areas of student representation in Ontario to the PEO and the provincial government.

Undergraduate Engineering education in Ontario will be changing over the next few years as programs like ATOP and PEO student membership become a part of our faculty. It is vital that we maintain a strong voice for the students in Ontario. This conference is where that voice is defined.

Cost Breakdown:

The ESSCO AGM '99 budget has not been finalized. The amount being sought is $800 to offset costs in administration, communications, presentation equipment, and to help subsidize accommodations.

Implementation Schedule:

To be used for this summer's conference, June 4th-6th.

Additional Information:

24. End-effector construction for WATFLEX

Submitted By:

Email: kkklam@engmail.uwaterloo.ca
Submitted by: Kenneth K. Lam 94083382
Phone Number: 519-747-0030
Position: 4B Systems Design Engineering

will benefit only 4th yr. systems student who continue this research.

Description of Proposal

This is a 4th year Systems Design Workshop project involving the design and construction of an end-effector for the WATFLEX experimental facility. WATFLEX stands for WATerloo Flexible Link Experimental Facility, it provides a mean to study the leading edge robotic design based on the flexible link assumption. However, the robotic manipulator currently is not fully operational because the end-effector has not been developed.

The current task is to construct the missing link of this facility so that WATFLEX can be operational in the near future.

Benefits:

As mentioned before, this facility is very crucial to the study of flexible link robotic manipulators. This is of insurmountable importance to the development of space manipulators and other manufacturing robotics, because the results of this research will spin-off into lighter, faster and more reliable robots.

The design of the end-effector also incorporates some innovative design such as a curved element gripper, and this is also the main objective of this project to realize and verify this design.

Cost Breakdown

Due to the complex nature of the design, which possesses several critical joints and linkages, extremely high accuracy must be obtained in manufacturing. Therefore, some machine shop time must be allocated to allow professional mechanics to meet up with the stringent requirements of machine tolerance and accuracy.

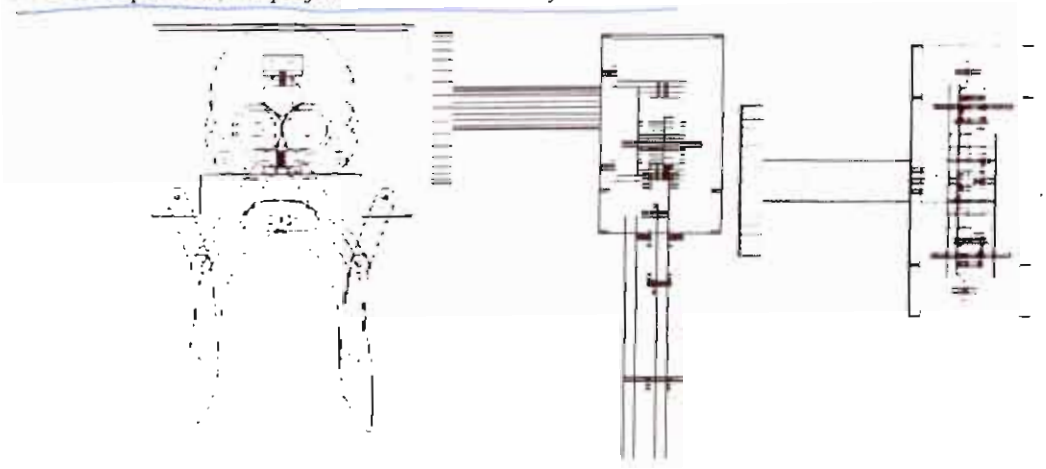
According to the student machine shop supervisor Clerence, he suggested a minimum working hour of 50 hrs must be allocated for the construction. Given the extra parts that are needed to be machined and constructed, the minimum hour is estimated at 100 hr. The current cost of labour is $14/hr. The construction parts and material are relatively inexpensive, mostly aluminum. Specially ordered parts will be included in the total cost as well. The cost of some critical components (i.e. dampers, springs, air tanks) will be absorbed by the Dept. of SYDE and are excluded from this WEEF proposal, and therefore are excluded in this proposal.

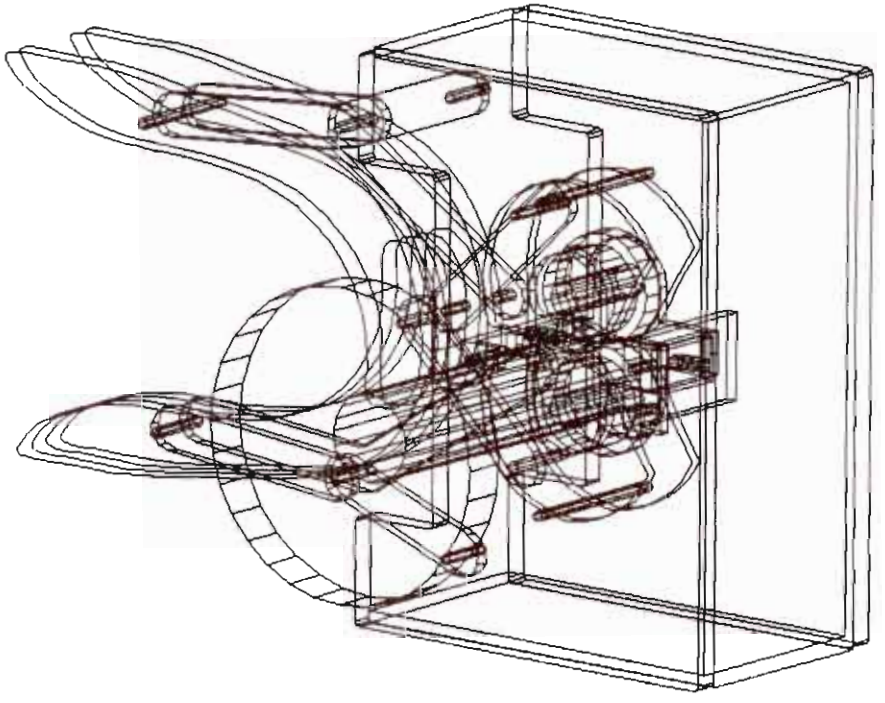
Here is the breakdown of the grant requested.

Description	unit cost	quantity	total
Labour Cost			
	14	100	1400
Parts Cost			
Aluminum Plates			10
Pins/bushing/washer/rings			50
Grand Total			1460

Implementation Schedule

As soon as possible, the project *must* be finished by Mar 30.





AutoCAD drawing of the end-effector

25. Team Advancement For The Formula SAE Project

Submitted By:

Your Name: Bryan Hemphill
E-mail: brhemphi@engmail
Phone Number: ext. 5904
Position: Team Co-Leader '99 Formula SAE

Description of Proposal:

This term as with the past two in '99 we are aiming to allocate the weef funding towards team improvement. That means that we as a team have made a commitment to advancing the future of the FSAE program here at the University of Waterloo. It will give us great pride to see future FSAE teams maintain the title of #1 CANADIAN TEAM!! Consumables are not included in the items requested for funding from WEEF. Items like tools, instruments and safety equipment are things that can continue to help FSAE team for years to come.

Proposal Benefits:

As was mentioned only items that may go to advance the quality of the team as an entity over many years will be considered for WEEF funding. We have established what this means in terms of what we require to build the FSAE race car each and every year and have come up with the following list of items. They will continue to help with testing, build and safety for at least 3 years to come.

Cost Breakdown:

Racing Uniform (Nomex)	– 1 @ $1200.00
Helmet	- 1 @ $500.00
Assorted Shop Tools	- Quantity $1000.00
13" Al Racing Wheels	- 1 set $900.00
Water Brake For Dyno	- 1 @ $3000.00
Load Cell For Dyno	- 1 @ $200.00
Printer – 11 x 17 compatible	- 1 @ $500.00
Repairs to Hand me down trailer	- Quantity $1500.00

Total amount requested for funding from WEEF $8800.00
Partial funding can be provided by any combination of the above requested items.

Implementation Schedule:

Immediate upon approval of funding from WEEF.

Additional Information:

All of the above listed items are required. FSAE actively seeks industry help in funding of our car. Any combination of the above items for funding would be welcome. Certain items are required in quantities greater than specified here. For example the Racing uniforms are required in small, medium and large, each of which costs the unit price listed above. We are asking for funding for only one of these uniforms from WEEF and we will raise the money for the other two independently.
Dynamometer cost is actually in the range of $10000.00 but we have a dyno stand established already and can make due with properly sized components such as the water brake and load cell. This means that this is already in the partial funding category compared with an entire dynamometer.

26. Midnight Sun V Solar Car Project Request for Funding

Submitted By:

Name: Lukasz Pawlowski
E-mail: lwpawlow@midsun.uwaterloo.ca
Phone Number: (519) 888 - 4567 x 2978
Position: Business Manager

Description of Proposal:

This coming June solar cars from all across North America will converge on Washington, DC, to begin Sunrayce 99. This competition will take them down the eastern seaboard of the United States to the finish line awaiting them in Orlando, Florida. Over the grueling 2,175 km in between, every aspect of the solar cars will be tested, especially because the race route runs over the Appalachian Mountains.

The goal of the Midnight Sun V Team is not only to participate in Sunrayce 99, but to take first place overall. Building on solid engineering practices, the latest in computer aided engineering, and a wealth of past experience, the team is poised to make a strong run for the finish line. However, in our current financial position we are unable to purchase all the components that will aid in our success in Sunrayce 99. Thus, we approach WEEF to help with a portion of our requirements. The MPPTs and the Rear Shocks were submitted to WEEF for funding in the Fall 98, but at that time these items were not funded.

Maximum Power Point Trackers

Maximum Power Point Trackers (MPPTs) are used to optimize power consumption on the car. The AERL MPPT is a power transformer that is used to optimize solar array performance under adverse conditions. These devices typically add 20-30% to the solar array output. They work by sensing the performance of the array connected to it and adjust the array voltage to find the optimum point to the cell's I-V curve. This results in maximum power availability. To fully optimize the output of the solar array on Midnight Sun V, the Team will require 4 additional MPPTs. The Midnight Sun Project requests that WEEF fund the purchase of these components.

Rear Shocks

Sunrayce 99 rules stipulate that each competing solar car must have four wheels. The Midnight Sun team will reuse the frame from the Midnight Sun IV car in building Midnight Sun V. To comply with the four wheel rule, Midnight Sun has redesigned the rear suspension to incorporate a fourth wheel into the Midnight Sun IV frame. This change in suspension results in the Project having to invest in new shocks for the car. Midnight Sun requests that WEEF fund the purchase of two new rear shocks for the suspension system of Midnight Sun V.

NGM Aluminum Solar Car Wheels

In adding a fourth wheel to a three wheeled car, Midnight Sun has need for two extra wheels. One of these will be used directly on Midnight Sun V, while the second will serve as a spare. The NGM Aluminum Solar Car Wheels are designed specifically for use at highway speeds, 90km/h, and are reusable from race to race; Midnight Sun V will reuse 6 wheels previously purchased for Midnight Sun IV. These wheels are an instrumental part of the safety factor designed in to Midnight Sun V. The team requests that WEEF fund the purchase of two NGM Aluminum Solar Car Wheels.

Motor Controller R&D

In Sunrayce 97, the Midnight Sun project was knocked out of contention for first spot by an electrical failure in the motor controller of the car. This event has served as a challenge to the Midnight Sun team to create a superior motor controller. Through the exercise of designing, building and testing a mission critical system, students at UW will gain invaluable technical knowledge. Also, it is the hoped that this development will lead a marketable motor controller that will place Midnight Sun and UW Engineering at the forefront of solar car motor controller technology. Any proceeds from the eventual sale of Midnight Sun motor controller technology will be directed solely toward UW undergraduate endeavors. This development is expected to cost $3,000. Midnight Sun requests that WEEF aid in paying for the R & D costs of this project.

Proposal Benefits:

Over the next 7 months, the Midnight Sun V Team will be devoted to developing a competitive car to race in Sunrayce 99. Students from many faculties are involved in designing and building subsystems for the car. Currently, the team consists of about 85-100 engineering students from all disciplines. Our seventh place overall finish as well as our Technical Innovation Award in Sunrayce 97 encourage us to push the talent of Waterloo Engineering students to its maximum. Many students will also be dealing with industry for obtaining sponsorship and consulting. The investment by WEEF in the research and development of a new motor controller will help to establish Waterloo Engineering as a leader in solar car electronics. It will show again the innovative nature of UW students and may result in a marketable product whose proceeds will directly benefit UW undergraduate engineering students.

Goals of Midnight Sun V:

- To design, build, and race a winning solar car for Sunrayce 99 in June of 1999
- 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.
- To further alternative fuel technologies through research and development efforts

Students who work on this project develop manufacturing techniques and rigorous validation systems in order to produce a winning design. Students also benefit through working with industry contacts, professors, graduate students, and each other.

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

Plan A

Total: $7,304.30

Item	Quantity	Amount
Maximum Power Point Tracker	4	$3,800.00
Rear Shock	2	$1,200.00
NGM Aluminum Solar Car Wheels	2	$704.30
Motor Controller R&D	N/A	$1,600.00

Plan B

Total: $ 6,304.30

Item	Quantity	Amount
Maximum Power Point Tracker	4	$3,800.00
Rear Shock	2	$1,200.00
NGM Aluminum Solar Car Wheels	2	$704.30
Motor Controller R&D	N/A	$600.00

Plan C

Total: $5,704.30

Item	Quantity	Amount
Maximum Power Point Tracker	4	$3,800.00
Rear Shock	2	$1,200.00
NGM Aluminum Solar Car Wheels	2	$704.30

Implementation Schedule:

Items being requested will be purchased immediately upon the availability of funds. Please note that these items are critical to the participation of Midnight Sun in Sunrayce 99.

Additional Information:

Sunrayce 99 promises to be an exciting race for the University of Waterloo. The Midnight Sun Team has made a name for itself due to its excellent performance in previous Sunrayce competitions, especially Sunrayce 97. We will carry the name and reputation of our school far down the eastern cost of the United States under extensive media. Given the caliber of students on the team, we can only expect to improve our overall race ranking. We are proud to represent the University of Waterloo Engineering Faculty, the University of Waterloo, and Canada in this endeavor.

This is the last opportunity for WEEF to support Midnight Sun before Sunrayce 99 in June.

Midnight Sun would like to thank WEEF for its on going support of Midnight Sun V. As a result of contributions made by WEEF to Midnight Sun, WEEF is currently a **Silver Sponsor** and will have its logo on the Midnight Sun V car for Sunrayce 99.

27. Computer Upgrade for IEEE McNaughton Centre

Submitted By:

Name: Alak Ghosh
E-mail: aghosh@engmail.uwaterloo.ca
Phone Number: ext. 6955 (branch), (home) (519)-746-9855
Position: co-chair of IEEE Student Branch "B"

Description of Proposal:

This is a proposal to upgrade the computing facilities of the McNaughton Centre (IEEE Student Branch centre). We currently have two old 486 systems running DOS and Windows 3.1 and the recent upgrade of the network to Polaris has rendered these machines obsolete. We propose several levels of upgrade depending on the funding available. At the very least we would like to have two upgraded or new machines connected to the Polaris network. With full funding we would purchase two new machines to connect to Polaris and we would upgrade the two 486 machines for standalone project use in the centre. This would give us a total of four functional machines in the centre.

Proposal Benefits:

This proposal will allow us to re-establish access to the network and will allow us to provide IEEE student members with updated computing facilities for carrying out student projects in the centre. With the installation of the swipe card system, made possible with the previous WEEF donation, student members of the IEEE (~300 students) will now have open access to the facilities of the McNaughton Centre. This will be especially important with the new addition of a three-term project, starting in 3B for electrical and computer engineering students.

Cost Breakdown:

All prices quoted below include taxes.

Upgrade of 486 machines:

AMD K6-2/350 MHz
6.4G HD
ATI XPERT@WORK 98
64M RAM

Price: $ 830 (each machine)

17" Goldstar Monitor (to upgrade old monitors)
Price: $ 460 (each monitor)

Purchase of new machines:

Pentium II 350 MHz system
6.4G HD
ATI XPERT@WORK 98
64M RAM

Price: $ 1450 (each machine)

17" Goldstar Monitor (required for new machines)

Price: $ 460 (each monitor)

Any number of the above options up to four (2 upgrades, 2 new) would be acceptable.

Implementation Schedule:

We will upgrade the computing facilities of the McNaughton Centre immediately upon obtaining funding.

Additional Information:

We would like to bring to your attention the fact that any money provided by WEEF, towards the enhancement of the McNaughton Centre, is eligible for matching by the IEEE Canadian Foundation.

28. "Northern Camel" Supermileage Vehicle

Submitted By:

Your Name: Mark Griffioen
E-mail: md3griff@engmail
Phone Number: 746-4826
Position: Team Leader

seems ok.

Description of Proposal:

The "Northern Camel" Supermileage Vehicle is the UW entry in the 1999 SAE Midwest Supermileage Competition. Several bicycle components and other materials are used in the construction of the vehicle. These components will be purchased from local suppliers. Labour costs are also incurred from frame welding. We are asking for $500 to assist in these costs.

Proposal Benefits:

+ 10-12 others.

The 5 core team members are using this project as their 4th year project (ME 482). Several other students are helping with the design/constructions of the vehicle, gaining good team project experience. As well, the school has had great success in the past in fuelathon competitions and other such design competitions. A good showing, especially a win, in these competitions helps build the reputation of the school and the Faculty.

Cost Breakdown:

Rear suspension	$	300.00
Lexan for cockpit hatch	$	60.00
Welding Labour	$	150.00
Styrofoam for aerobody	$	50.00
	$	560.00

We are only asking for $500 of this amount.

Implementation Schedule:

We are purchasing these parts immediately and require funds immediately to reimburse students.

Additional Information:

29. UW CASI Free Flight Glider Team 1999

Submitted By:

Your Name: Gregory Thompson
E-mail: g2thomps@engmail.uwaterloo ca
Phone Number: 886-7093 or 221-2240
Position: Project Manager

Description of Proposal:

We are looking for WEEF to sponsor our 1999 team for our competition in May of 1999. We require funds to purchase composite materials and related equipment for the construction of the final gliders for entry into the competition. Additional funds are requested for the competition entrance fee and fund the hosting of the competition.

Proposal Benefits:

- We hosted the competition in 1998 here in Waterloo which was an extreme success. We have been asked to host the competition again in 1999.
- A half-size prototype of the 1999 glider was taken to the competition in May and performed extremely well compared against the full-size gliders of the other schools.
- The competition is a national competition against schools from Ontario, Quebec and the Western Provinces. Our team won the 1997 competition in Carelton with our flying wing glider.
- The project is a lead in to ME564 Aerodynamics, ME 533 Composite Materials, ME 482 Project Course plus all of the basics (MODS etc....)
- We have in the past obtained sponsorship from many large aerospace companies including de Havilland, and AlliedSignal Aerospace. We are actively seeking corporate sponsorship from industry again this year.
- The equipment we purchase can be used for other teams plus the equipment will be assets for future glider projects.
- The glider team will advertise the WEEF sponsorship of our project via our WEB page, the team T-shirts, and on the glider itself.

Cost Breakdown:

We are looking for funding for:

FULL FUNDING

Equipment	Composite Ceramic Scissors	$150
	Video Camera Replacement Battery	$200
Materials	Vacuum Bagging Consumables and mold making supplies	$125
	Epoxy	$150
	1.7 oz Kevlar Weave	$133
Hosting	Information package and initial hosting costs	$300.00
	Team entrance fee	$150.00
Total		**$1208.00**

PARTIAL FUNDING OPTION:

Equipment	Composite Ceramic Scissors	$150
	Video Camera Replacement Battery	$200
Materials	Vacuum Bagging Consumables and mold making supplies	$125
	Epoxy	$150
	1.7 oz Kevlar Weave	$133
Total		**$758.00**

Implementation Schedule:

Our preliminary schedule is:

Build Final Prototypes by	February 28, 1999
Test Fly Gliders, Hosting Prep.	March, 1999
Report Due	March 31, 1999
Build Competition Gliders	March, April, 1999
Hosting Preparations Completed	April, 1999
Competition	May 9-11, 1999

Additional Information

Background on the Team:

The UW CASI Free Flight Glider team is a group of students who are constructing a glider which will be entered in a National Competition in May of 1999, sponsored by the Canadian Aeronautics and Space Institute (CASI). This will be the third entry into the competition for the team. In 1998 our team worked on the development of a new flying wing which was originally to be entered into the 1998 competition. Unfortunately, development time took longer than anticipated and it was decided to forgo entry into the 1998 competition. Despite setback the team hosted the competition here in Waterloo and was a resounding success. During the competition a development prototype was flown, it far outperformed many of the other entries. This prototype was an offspring of the flying wing design which was so successful in the 1997 competition in Ottawa. In 1997 the flying wing was able to carry the largest payload of the competition for the longest time. Our goal is to enter the 1999 competition with a glider which can carry 3 kilograms for 75 seconds, a result which has never been obtain previously in the competition.

Level of Development:

A full computational fluid dynamics analysis has been completed on the 1999 glider design. We are currently, finishing the prototyping and windtunnel testing of the stability system for the 1999 glider. This is being done as part of a ME564 Aerodynamics project.

We have also begun construction of the final glider prototypes which will be replicated for the competition gliders.

30. University of Waterloo Aerial Robotics Group

Submitted By:

Your Name: Dave Kroetsch
E-mail: dd2kroet@warg.uwaterloo.ca
Phone Number: x5109
Position: Team Leader

Description of Proposal:

The Waterloo Aerial Robotics Group (WARG) was began in the fall of 1997 and currently consists of approximately 10 core members. Its membership consists mainly of undergraduate students from the Department of Electrical and Computer Engineering, but it also includes undergraduates from Systems Design and Math, several graduate students and even a visiting scholar. The group was formed to design and build an entry for the Associate for Unmanned Vehicle System's "International Aerial Robotics Competition of the Millenium." This competition is a series of three events - two entry qualifiers in 1998 and 1999 and the Millenial event in the year 2000.

WARG successfully completed its entry in the 1998 competition and achieved a 2nd place finish, beating teams from M.I.T., U.C. Berkeley, Georgia Tech and Southern Polytech. After this impressive finish, we are now preparing our robot for the 1999 qualifier.

There is a lot of work necessary to complete this task and as a result the group has expanded. This year we opened the project to all interested students and now have more than 42 people involved! We hope to also expand our team of robots and have a multi-robot entry this summer. In order to accomplish this, we are, however, in need of funding to purchase more equipment to make this expansion possible.

Proposal Benefits:

WARG is one of the few Canadian teams entering. Competitions such as this help promote our faculty's reputation with other international schools and with the engineering community. This project will also help fulfill the need for an increased design component in the Electrical and Computer Engineering curriculum. We have already had discussions within our department and they wish to use our project as a model for the design component of our course. This group's work will help promote the reputation of the Faculty of Engineering here at the University of Waterloo. By opening the group to interested people, through a series of subprojects, we have allowed a greater number of students to participate in this project. Our group is also closely linked with the sponsoring industry and it gives students the opportunity to interact at a closer level with industry. We believe that this is an exceptional opportunity for students to get involved in extracurricular activities and to apply their skills from both work and school to an exciting project.

Cost Breakdown:

Model Helicopter Kit	$3000.00
Fluke Scopemeter	$1500.00
Ground Vehicle	$750.00
Embedded Computer System	$800.00
DSP Daughter Processing Boards	$950.00
Batteries and Recharging Power Supplies	$475.00
Single Board Computer for Ground Vehicle	$400.00

Total	$7875.00

Funding Options

Option 1 – (Helicopter, Scopemeter, DSPs, Ground Vehicle)	$6200.00
Option 2 – (Helicopter, DSPs, Ground Vehicle, Embedded Computer)	$5500.00
Option 3 – (Scopemeter, Ground Vehicle, DSPs, Embedded Computer)	$4000.00
Option 4 – (Ground Vehicle, DSPs, Embedded PC, SBC, Batteries)	$3375.00
Option 5 – (Ground Vehicle, Embedded PC, SBC, DSPs)	$2900.00

Implementation Schedule:

We are currently preparing for the 1999 qualifier which is to be held on June 26, 1999, in Richland, Washington. Funding is necessary to help us prepare for this upcoming qualifier and to allow us the necessary supplies to add to our team of robots. The equipment listed is greatly needed to help us accomplish this before this summer.

Additional Information:

None.

31. Antenna and Triplexer

Submitted By:

University of Waterloo Amateur Radio Club
Craig Martin
E-mail: cdmartin@amprgate.uwaterloo.ca
Phone Number: x6166
Position: President

– Seems OK?

Description of Proposal:

An antenna and triplexer are required to allow the use of the existing 2 metre (146 MHz) repeater and the new 23 cm (1280 MHz) repeater. Plans are to eventually add an 70 cm (440 MHz) repeater. All repeaters will eventually be cross linked to each other and to the telephone. Funding has been approved for the purchase of the 23 cm repeater. The arrival of the 23 cm repeater will necessitate the upgrading of the antenna system.

Proposal Benefits:

There is an low gain homemade antenna being used for the 2 m repeater. The interest of students in the area of Amateur Radio will be enhanced with the proper installation and operation of the 2 m and 23 cm repeaters. The IT (Information Technology) courses can be enhanced for the students if they pursue extracurricular activities in RF, digital packet, fast scan TV, and microwave areas of Amateur Radio. Projects in the E&CE-47x courses can be enhanced by using the 23 cm and 70 cm repeaters.

Cost Breakdown:

Antenna:	Diamond Model X-5000	$360.00
Triplexer:	MX-3000,	$175.00
Pole/Hardware:	25 feet long x 2" dia.	$ 55.00
	Taxes	$ 88.50
	TOTAL	$678.50

Implementation Schedule:

Purchase can be made immediately upon receiving funding. We would like to install everything by March 01, 1999, weather permitting.

Additional Information:

The upgrade of this 2 m repeater antenna has been a priority for over two years. The 2 m and 23 cm repeaters can now be used on one antenna which would have significant gain. RIM has donated funds to purchase the 23 cm repeater only. We are required to find funding for the antenna/multiplexer system, and for the eventual upgrade of the repeater controller. The controller upgrade will be required when the 70 cm repeater can be funded. Some 70 cm equipment has been made available by E&CE staff.

in about 1 yr.