

**Engineering Student Technology Committee
Technology Fee Project Proposal**

Must be submitted on or before February 9, 2001

Please use this form to request technology fee expenditures for equipment in classrooms, computer laboratories, or other instructional or research laboratories, in keeping with the State Board of Agriculture Charges for Technology Manual guidelines found at <http://www.colostate.edu/services/acns/itec/fee.html>. Technology committee members are available for assistance, the names of whom appear in Section IV. Also see Section IV for submission information.

Section I. Overview

1. Title of proposal

Enhancement of CAD/CAM/CAE software of the college

2. Submitted by (Name & contact information of primary submitter(s) – up to three)

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3. Proposal supported by*

* Proposals with wide-spread support from a cross-section of the college will be given preference. Although this form may be submitted electronically with a list of supporters, actual signatures are required for all supporters beyond the original submitter(s).

4. This project request is

- for student wages
- for software
- to maintain and/or upgrade existing facilities (replacement equipment only requested)
- to augment and maintain existing facilities (some new equipment requested)
- to provide a new facility (all new equipment requested)

5. Brief summary of proposal (Please limit answer to no more than one paragraph)

Currently 60 seats of AutoCAD and 40 seats of SolidWorks are available to engineering students. Since the CAD technology of AutoCAD is that of 1970's and students have the access to the CAD technology of 1990's only through 40 seats of SolidWorks. Thus it is proposed to increase the number of SolidWorks seats from 40 to 60, and newly obtain the license of Pro/Engineer. SolidWorks has proven to be an easy to use and powerful CAD program that is good for introducing students to modern CAD systems. Pro/Engineer is the most powerful CAD/CAM/CAE system in the world, having capabilities such as FEA, composite features, CAM, and surface features that SolidWorks does not have. Pro/Engineer is more difficult to use, but the advanced users who have learned and used SolidWorks will have no difficulty in using Pro/Engineer. Currently, AutoCAD is used much less than SolidWorks by mechanical engineering students.

6. Location for proposed equipment or software:

The software licenses would allow for all computers that are under ENS control to have access to this program.

6a. Equipment/Software requested (complete only if proposal is for equipment and/or software):

Specific software needed	Number Requested	Unit Cost	Total Cost
Pro Engineer	Multi-License	\$2,500	\$2,500
SolidWorks	20	\$75	\$1,500
Total cost:			\$4,000

If AutoCAD seats can be reduced from 60 to 20, the cost of this proposal can be paid with the reduction in the AutoCAD license fee.

Section II. Pedagogical considerations

1. What are the pedagogical goals of this proposal? (Please limit answer to no more than three paragraphs)

The goal of this proposal is to provide the engineering students with the state-of-the-art CAD/CAM/CAE programs. Because of the prevalence of the use of such programs in industry, employers expect graduating students to have the skills and knowledge to use such programs. Thus students need to be able to use such programs in order to get jobs in industry. Even in doing senior design, they need to use such programs.

Another goal that this proposal hopes to achieve is to allow the students of the 2001-2002 school year to have immediate access to the state-of-the-art CAD software. In 2000-2001, students had to wait a month before SolidWorks 2000 was installed on the network.

2. Why is the request appropriate for the goals stated in #1, above?

(complete only if proposal is for equipment and/or software):

AutoCAD is essentially a 2D CAD program suitable for preparing engineering drawings. It is based on the CAD technology of 1970's. From late 1980's to early 1990's, the mainstream CAD systems changed into 3D feature-based solid modeling CAD systems. SolidWorks and Pro/Engineer are two of such state-of-the-art CAD systems. SolidWorks is popular because of its ease of use. In this college, students create design models with SolidWorks, then analyze them with Algor (an FEA program) and Fluent (a CFD program), and machine them with ProCAM (a CAM program). Pro/Engineer is difficult to use but it is the most powerful CAD/CAM/CAE program in the world, and it is the most popular program in industry. With these programs, students can learn the state-of-the-art way of developing products. They will be able to meet the expectations of future employers.

3. Planned course/research benefit:

<u>Course No./Research projects</u>	<u>Number of students affected/semester</u>
ME 198	120
ME 304	80
ME 307	100
ME 324	100
ME 468	80
ME 531	70

4. How will this proposal improve instruction (specific lessons, experiments, exercises affected, etc.)?

(Please limit answer to no more than three paragraphs)

More seats of SolidWorks will improve the availability of the program that is widely used by ME students, increasing the opportunity for students to learn how to design and analyze artifacts using the state-of-the-art CAD/CAM/CAE systems. Because of its ease of use, SolidWorks is a very good tool to introduce students to modern CAD systems. Pro/Engineer will give the students access to programs that are not currently available at CSU. Such programs include Pro/Composite component of Pro/Engineer that can model and analyze structures of composite materials, Pro/Mechanica that can perform adaptive FEA and even shape optimization, Pro/NC that allows NC code generation. FEA will become easier because the timely step of importing a foreign file into the current FEA programs will not be necessary due to the fact that the FEA program is part of Pro/Engineer. Pro/Engineer is more difficult to use, but students who have learned SolidWorks will have less difficulty to use Pro/Engineer.

Section III. Operation, Maintenance, and Funding

1. What functionality will this equipment provide that is not already available elsewhere in the college?
Pro/Engineer will provide the capabilities for composite structure design and analysis. Also this software will provide a surface generator, and mechanism design capabilities that allows students to test moving mechanisms.

2. How many hours per week (M-F, between 7am and midnight) will this equipment be accessible for general student use? (complete only if proposal is for equipment and/or software)
The software packages will be available on the ENS network which is accessible during all of the questioned times.

3. How will students be made aware of this project? (complete only if proposal is for equipment and/or software)
This software packages will be made available for student projects, and will be announced in classes defined above.

4. Complete either A or B:

A. If this request is for student employee wages, who will be the supervisor of those students?
(the supervisor must sign here if name does not appear in Section I, #2 or #3)

B. If this request is not for student employee wages, who will be responsible for oversight and any installation, ongoing maintenance, or repair for this project?
(the responsible party must sign here if name does not appear in Section I, #2 or #3)
ENS

5. What operation & maintenance services would be needed from ENS staff? from department staff?
Installation and upkeep regular to other engineering software.

6. What modifications of current space will be necessary to install the new equipment (remodeling, wiring, security, furniture, etc.) and what is the source of funding for those modifications?
File space to load the software.

7. What is the estimated cost of operational expenses (supplies, maintenance, supervision, student assistance, etc.) and how will those expenses be funded?

The support and training services are included with the unlimited seats licenses for Pro/Engineer.

8. What other sources of funding (and how much) exist for this project (outside grants, equipment donations, reallocation of existing equipment, etc.)?

This proposal would use funding that in the years past purchased extra seats of AutoCAD. In the past year, the college of Engineering spent \$6000 for 60 seats of Auto CAD. This proposal asks to reduce the number of seats of AutoCAD and use that money to pay for these two programs.

9. What attempts have been made to obtain the funding from other sources?

Section IV. Information

A. Form Availability

This form is available electronically from the committee web page at <http://www.engr.colostate.edu/college/committees/estc/> or from a member of the committee.

B. Submission Information

All forms must be submitted on or before February 9, 2000.

Forms may be submitted via campus mail to

Engineering Student Technology Committee
c/o Eric Mui, Chair
Engineering Network Services

The form may also be sent as an attachment via e-mail to ericmui@engr.colostate.edu.

C. Engineering Student Technology Committee

Associate Dean for Undergraduates

faculty: Johannes Gessler (gessler@engr.colostate.edu)

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undergraduates: *unfilled*

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Engineering Network Services

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Intra-departmental majors

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unfilled

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undergraduates: Mike Holland (mholland@engr.colostate.edu)

unfilled

graduate: Torrey Burgess (tb17241@engr.colostate.edu)