

To: Senate, Michigan Technological University

From: Senate Finance Committee, B. A. Barna and L. R. Davis, Co-chairs

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Copies: C. J. Tompkins, W. K. Wray, R. O. Warrington, M. E. Mullins, S. K. Kawatra

**RE: FINANCIAL IMPLICATIONS OF PROPOSAL 4-02, ELIMINATION OF BS DEGREE ENTITLED MATERIAL SCIENCE AND ENGINEERING, MINERAL PROCESS ENGINEERING CONCENTRATION**

At the request of the Senate, we have reviewed the financial implications of the proposed elimination of the BS degree program entitled Materials Science and Engineering, Mineral Process Engineering Concentration. The proposal calls for the elimination of this program effective with the conclusion of the 2002-03 Academic Year.

We estimate the projected savings/(costs) from elimination of this program as follows:

Year 1: 2001-02	Year 2: 2002-03	Year 3: 2003-04	Year 4 plus
(\$35,000)	\$219,000	\$124,000	\$165,000

This proposal originated with the College of Engineering and showed projected savings of \$309,708 [per year.] Both our approach and our results differ from those provided by the College and we will highlight these differences in the discussion below.

**FINANCIAL IMPLICATIONS:**

Proposal 4-02 calls for the elimination of the degree program and the transfer of the two, tenure track faculty to the Department of Chemical Engineering. Although these are two separate issues in our opinion, and are being considered by other committees within the Senate, we have elected to consider the transfers as part of the analysis for the time being. The proposal also calls for shifting the Research Engineer position from the "general fund to soft money funds if they become available." The attached spreadsheet, Table 1, from the COE shows a credit for three entry-level faculty positions at \$64,000 each plus the shifting of the Research Engineer line to generate the projected savings. The third faculty position is related to a current open line in the mineral processing area.

Table 2 presents the financial projections prepared by the Finance Committee for Proposal 4-02. We disagree with taking a credit for the open line in Mineral Processing since it is unlikely that the program would be allowed to fill this line in light of low current enrollments and the University's financial difficulties. We also disagree with taking a credit for the transfer of the Research Engineer position to soft money since this decision could be made without the elimination of the program. Accordingly we show a credit for two lines only in the S&W category.

It also appears that the COE analysis considers only the effect of these actions upon the general fund. We have chosen instead to draw the boundary around the entire University.

Furthermore, we consider the timing of the credits to be important and have thus expanded our analysis to show year-by-year projections. This should help to avoid any confusion with one-time versus ongoing savings.

We note that the Chemical Engineering Department is not currently being allowed to fill its open lines. Thus it is inappropriate to claim a credit in this academic year for the two transfers. Not claiming a credit is further supported by the fact that the faculty being transferred will have to fulfill obligations to current students in the program for the first two years. Thus it is unlikely that they will be able to teach any chemical engineering courses for AY 2001-02. To properly reflect these facts we show the total value of the two lines in the S&W category along with fringes but then we apply a "productivity factor" for each year to adjust for the actual fraction of time that the transferred faculty will likely be able to devote to chemical engineering core activities. Salary increases are assumed to be three percent per year.

Since the two open lines in the Chemical Engineering Department would require start-up funds, we have added a credit for this item at \$75,000 per line shown as one-time money. These funds are not likely to be entirely from the general fund but they are monies that otherwise would be available for other programs or activities so it is appropriate to take the full credit when the balance is drawn around the University.

The final item in the category of direct savings/(costs) is the projected loss of tuition from the students in the program. Rather than use the current mix of students we have assumed the steady-state value of six total students in the program, three in year two and three in year three since students very seldom select this degree program in the freshman or sophomore year. Although the COE proposal suggests that students are likely to transfer to some other engineering program if this program is not available, this does not alter the fact that the loss of tuition from future students in this program must be allocated to the proposed elimination.

There are hidden costs (or externalities as the accountants like to call them) associated with this program elimination that the University would not incur were this action not taken. One key item in our opinion is administrative and faculty time associated with the elimination and transfer. We have allocated 100 hours in the first year and 50 hours in the second year for administrative time. Similarly, we have allowed 200 hours and 100 hours for faculty time to deal with the absorption of the program and department obligations.

Space is an important issue in the evaluation of program creation or elimination. We have calculated the appropriate credits using the values generated for MTU by Paulien and Associates in their 1991 study of 1.0 assignable square feet (asf) per weekly student contact hour and 0.57 ratio of assignable to total space. The students are assumed to each take a full load of 15 credits. The University's share of the required investment in space was assumed to be half of the projected cost of \$200 per square foot. Since the University has new construction approved, we must assume that there is alternative use for the space that is released. The credits for investment are one-time as the students

graduate from the program. Operating costs for the space were estimated at \$5.00 per square foot per year. The credits for operating costs are ongoing as the space is permanently assigned to other use. Because of the small number of students involved, it is possible that the amount of space actually released will be greater than the per student value predicted using the Paulien data.

When student numbers are reduced, there are also likely to be credits associated with classes outside of the student's major program. To treat this properly would require an understanding of which of these non-major classes have spare capacity and which are at capacity. At this time we have elected to omit this item from the analysis. With the number of students involved, a more rigorous treatment of this item should not significantly affect the analysis.

Also in the area of hidden costs we anticipate a reduction in alumni giving as a result of the program elimination. Several of the alumni from this program area have been very generous donors in the past. The current chair of the department suggests that the reduction in donations could be "substantial." We have made a request to the Michigan Tech Fund for historical donor data related to this program but that information is not yet available. We have not included a cost for this factor due to the uncertainty but do wish to point out that the losses could well approach the projected savings if these alumni are not brought on board with the decision.

Table 1: Budget Details for Elimination of the BS in Mineral Process Engineering

Item	Summary Description	SS&E	Student S&W	Non-student S&W	Fringes @39.9%	Item Total
1	move MP fac member to CM and don't fill open position			64,000	25,536	89,536
2	move MP fac member to CM and don't fill open position			64,000	25,536	89,536
3	don't fill open MMPE position			55,000	21,945	76,945
4	put research engr on soft money			38,378	15,313	53,691
		-	-	221,378	88,330	309,708

Assumption: Average cost of new faculty member = \$64,000/year, based on recent cost of hiring assistant professors

Current open MMPE position is budgeted for \$55,000

10/5/01  
NJH

**Table 2: Financial Impact for Elimination of the BS in Mineral Process Engineering**

ITEM	Year 1 2001-02	Year 2 2002-03	Year 3 2003-04	Year 4+ 2004-05
<b>DIRECT SAVINGS/(COSTS)</b>				
S&W:				
MP faculty member to CM open position	\$ 32,000	\$ 64,000	\$ 65,920	\$ 67,898
MP faculty member to CM open position	\$ 32,000	\$ 64,000	\$ 65,920	\$ 67,898
Fringes @39.9%	\$ 25,536	\$ 51,072	\$ 52,604	\$ 51,072
Productivity factor CM (0, 0.5, 0.75, 1.0)	\$ (89,536)	\$ (89,536)	\$ (46,111)	\$ -
SS&E:				
Use \$3000/FTEF (transfers to CM)	no change	no change	no change	no change
ONE-TIME ITEMS:				
Start up funds for CM positions (2)		\$ 150,000		
STUDENT RELATED CREDITS/(DEBITS)				
Six students (3 jun., 3 sen.) @ \$3809	\$ -	\$ (11,427)	\$ (22,854)	\$ (22,854)
Student auxilliary contributions	neglect	neglect	neglect	neglect
<b>TOTAL DIRECT</b>	\$ -	\$ 228,109	\$ 115,479	\$ 164,013
<b>HIDDEN SAVINGS/(COSTS)</b>				
Administration				
Incremental load on Chairs, Dean, Provost, etc				
Allow 100 and 50 hours @ \$150/hr	\$ (15,000)	\$ (7,500)	\$ -	\$ -
Faculty:				
Allow 200 and 100 hours @ \$100/hr	\$ (20,000)	\$ (10,000)	\$ -	\$ -
Space credits				
Investment reductions @\$200/sf	\$ -	\$ 7,895	\$ 7,895	\$ -
Operating cost reductions @ \$5.00/sf/yr	\$ -	\$ 395	\$ 789	\$ 789
Alumni donations reduced	??	??	??	??
<b>TOTAL HIDDEN</b>	\$ (35,000)	\$ (9,211)	\$ 8,684	\$ 789
<b>GRAND TOTAL SAVINGS/(COSTS)</b>	\$ (35,000)	\$ 218,898	\$ 124,163	\$ 164,803