ITEM 108-2801-R0900 ATTACHMENT

COMPUTER ENGINEERING TECHNOLOGY PROGRAM PROPOSAL

The submission materials were prepared by Larry Strizich, associate professor of electronics engineering and computer information systems; and Lloyd Stallkamp, professor of electronics engineering.

Goals and Objectives

A Computer Engineering Technology degree program provides the general education of an Engineering Technology degree and the skills training to obtain employment in the computer or electronics field. The program consists of a 2 + 2 sequence, ending in an Associate of Applied Science in Computer Engineering Technology and Bachelor of Science in Computer Engineering Technology.

Description of the Profession

The Information Technology industry has become pervasive in all levels of business and industry in the United States as well as in Montana. Studies routinely state that between 250,000 and 750,000 jobs in the industry go unfilled each year as a result of the lack of qualified applicants. Engineering Technology appropriately fills a niche in the demand market by providing graduates with a strong math/science background and specific training in both the hardware and software necessary to design, install and maintain the complex computer systems demanded by contemporary business. In addition, the rapid change of technology dictates that today=s graduate must be able to continue to learn and grow with the changes in technology.

The Computer Engineering Technologist would provide the highly technical knowledge necessary to understand data systems requirements, to design and specify hardware and software necessary to meet these needs, and to install and maintain this equipment and software.

Currently, there are no Engineering Technology programs in the state that address this type of job. At the same time, employment opportunities for technical support and information systems technicians abound.

The Proposed Degree

This proposed curriculum includes a total of 124 semester credits for the Bachelor=s degree. This number is the minimum required for the program to be considered for accreditation by the Accreditation Board for Engineering and Technology.

Freshman year - Fall Semester

IET	**100**	Intro to Industrial & Engineering Tech	**3**
EET	**101**	Intro to Electricity/Electronics	**5**
ENGL	**111**	Written Communication I	**3**
CIS	**111**	Integrated Business Applications	**3**
MATH	**112**	College Algebra	**3**
		Total 17 SCH	

Freshman year - Spring Semester

EET	**103**	Electronic Fund. I	**5**
ENGL	**112**	Written Communication II	**3**
CIS	**115**	Intro to Programming	**3**
MATH	**125**	Trigonometry	**2**
		Social Science Elective	**3**
		Total 16 SCH	

Sophomore year - Fall Semester

CIS	**155**	Programming I	**3**
EET	**207**	Digital Fundamentals	**5**
CPET	**260**	Intro to Networks (Netprep1)*	**3**
PHYS	**231**	Fund. of Physics I	**4**

SPCH	**141**	Fund. of Speech	**3**
		OR	
SPCH	**142**	Interpersonal Communication	**3**
		Total 18 SCH	

Sophomore year - Spring Semester

EET	**204**	Electronic Fund. II	**4**
CPET	**201**	Computer Hardware I*	**3**
CPET	**211**	Discrete Mathematics[1]	**3**
MATH	**133**	Intro. to Calculus	**3**
		Social Science Elective	**3**
		Total 16 SCH	

Total for AAS degree 68 SCH

Junior year - Fall Semester

EET	**305**	Digital Systems	**3**
MATH	**220**	Calculus & Analytic Geometry	**5**
CIS	**360**	Networking I	**3**
		Math/Science Elective (upper division)	**3**
		Total 14 SCH	

Junior year - Spring Semester

CIS	**255**	Programming II	**3**
		Math/Science Elective	**4**
		Humanities Elective	**3**
		Upper Division Electives	**6**
		Total 16 SCH	

Senior year - Fall Semester

CIS	**300**	Operating Systems	**3**
EET	**450**	Adv. Digital Systems	**3**
CIS		Elective	**3**
		Upper Division Electives	**6**
		Total 15 SCH	

Senior year - Spring Semester

EET	**401**	Interfacing	**3**
EET	**430**	Advanced Communication Systems (Dig)	**3**
		Elective	**3**
		Humanities Elective (upper division)	**3**
		Total 12 SCH	

Degree total for BS degree 124

A brief description of the new courses is attached as Exhibit A.

The new degree has been approved by the internal faculty review process at Montana State University-Northern. In addition, the provost and chancellor have also approved the program. Those approvals are attached as Exhibit B.

Faculty

A majority of courses in this program are currently offered as part of existing programs on the MSU-Northern campus. New courses will be developed and offered by existing faculty in the Electronics and Computer Engineering Technology and Computer Information Systems programs at Northern.

Students

The program will be offered initially on the Havre campus, as a partial substitute for the almost defunct bachelor's degree in electronics engineering technology. The latter degree was marked for termination as part of the recent program review process. Hopefully, this new degree will attract more students with marketable skills that are needed in today=s technology-driven marketplace. MSU-Northern also hopes to take this degree program to Great Falls, where considerable interest, especially among military personnel, has already been generated. Such a move will only be done in the collaboration with the Great Falls College of Technology, however.

Facilities/Support

Libraries: Library holdings and services on the MSU-Northern campus, and the linked MSU-system libraries, will provide materials sufficient to support the program. An exhaustive review of available library facilities will be part of ABET accreditation efforts.

Computer Services: Facilities on the MSU-Northern campus are adequate to support most of the laboratory needs of the program.

Equipment: Equipment and supplies have been purchased using MSU-Northern capital equipment funds adequate to support the projected needs of the program for the first year. Thereafter additional equipment may be required per budget information included herein. That budget information is attached as Exhibit C.

Space/Capital Structures: Present classroom and lab facilities on the MSU-Northern campus will adequately serve the immediate needs of the proposed program.

Support Services/Administration: Present administration policies and procedures at MSU-Northern will adequately support the program.

Accreditation

The Computer Engineering Technology program will satisfy Northwest Association of Schools and Colleges, Commission on Colleges institutional accreditation requirements. In addition, the program has been designed with the intent of seeking accreditation from the Technology Accreditation Council of the Accreditation Board of Engineering and Technology (TAC/ABET), upon graduation of the first students.

Assessment

As required by MSU-Northern policy, an industrial advisory board will be established for this degree program. Currently, the industrial advisory board for the Electronics and Computer Engineering Technology program at MSU-Northern has reviewed the proposal for this CPET degree and continues to advise the Faculty.

As is standard practice for courses at MSU-Northern, courses will be evaluated using student evaluation instruments administered each semester. Program assessment information required as part of the TAC/ABET accreditation review process will include outcomes assessment of students as well as assessment of program rigor and level as evaluated against the mission of MSU-Northern and other programs of this type nation wide. It is felt that this external review process is critical to establish and maintain the highest quality of this program.

Students will be encouraged to seek industry certifications as they progress through the curriculum, including TIA A+ Technician level certification, NACSE network professional certification as well as some vendor specific certifications pertinent to the Information Technology industry.

Exhibit A

Montana State University - Northern
Computer Engineering Technology Course Descriptions

CPET 260 - Intro to Networks (Netprep1)

Prerequisite: CIS 111

Coverage includes the basic concepts of networking including LAN & WAN hardware and software, OSI network model and the protocol services approach to networking

CPET 201 - Computer Hardware I

Prerequisite: none

An introduction to current computer hardware leading to the students ability to successfully pass the COMP/TIA A+ Certification exam. Includes study of system motherboard, memory, CPU, expansion bus and cards, video display adapters and display units, mass storage devices, power supply systems, operating systems and system setup.

CPET 211 - Discrete Mathematics

Prerequisite: MATH 112, 125

Mathematics and logical processes used in computer programming and design. The course will include coverage of Boolean algebra and logic, Linear Algebra, number systems including binary, octal and hexadecimal.

Exhibit B

PROCEDURAL SEQUENCE FOR ACADEMIC SENATE APPROVAL OF PROPOSALS

1. Submit all proposals to the Office of Academic Affairs.
2. The Senate President will log items and forward them to the appropriate Senate subcommittees.
3. The Senate subcommittee will send the proposal to the Senate.
4. Senate proposals will be considered by the Full Faculty.
5. If approved, the proposal will then be forwarded to the Provost/Senior Vice Chancellor.

Proposals that require action to approve/disapprove/table or remand will be sent back to the Senate according to the monthly meeting schedule.

TITLE: NEW DEGREE COMPUTER ENGINEERING TECHNOLOGY A.A.S. & B.S.

SUBCOMMITTEE: _____ **PROPOSAL #:** 99-39

PROPOSAL:

NEW DEGREE -- COMPUTER ENGINEERING TECHNOLOGY A.A.S.
COMPUTER ENGINEERING TECHNOLOGY B.S.

Action Signatures:

Submitter	Date 3/24/00	College Chair/Dean	Date 5/24/00
Committee Chair		Approve X Disapprove ____	Date 4/5/00
Committee Chair		Approve X Disapprove ____	Date 4/19/00
Faculty Senate President		Approve X Disapprove ____	Date 4/24/00
Provost/Senior Vice Chancellor for Academic Affairs		Approve X Disapprove ____	Date 7/28/00 with the revisions set out in the memo received on 7/24/00

Revised: 11/15/99

Roger A. Barbon, chief operating officer approved 7/28/00

Exhibit C

Computer Engineering Technology
Proposed Budget

	AY 2000/2001	AY 2001/2002	AY 2002/2003	AY 2003/2004
Staffing (note 1)	1.5	2	2.5	2.5
Operations (note 2)	$3,330	$3,663	$4,029	$4,432
Capitol Expenditures (note 3)	$1,000	$1,500	$1,500	$1,500
Maintenance (note 2)	$6,000	$6,600	$7,260	$7,986
Accreditation (note 4)	$3,500	$350	$350	$3,500

Note 1: Based on current FTE for electronics (EET) shifting to CPET degree program.

Note 2: Reflects current budgeted amounts for EET program, with 10% estimated increase per AY.

Note 3: Estimated equipment/software upgrades.

Note 4: Assumes ABET visit scheduled for Fall 200 (already budgeted) and annual accreditation fee. Expect ABET accreditation visit for conversion of degree from EET to CPET (AS) required fall of 2003, after first graduates from the new program.

---

* Denotes a new course.