

Shepherd University Board of Governors
March 8, 2007
Agenda Item No. 7

BACHELOR OF SCIENCE IN COMPUTER ENGINEERING

At its April 2006 meeting the Board of Governors authorized the President to seek the Chancellor's approval for Shepherd University to formally develop a plan for the offering of a Bachelor of Science in Computer Engineering Degree. That approval was granted and the University has been working closely with the Higher Education Policy Commission staff since that time to develop a program which would be acceptable to the HEPC and would meet the needs of Shepherd's service region.

The following resolution is recommended for adoption by the Board:

RESOLVED, that the Shepherd University Board of Governors approves the initiation of the Bachelor of Science in Computer Engineering Degree program, effective August 2007; provided, that the foregoing approval is subject to the final approval of the Higher Education Policy Commission prior to such initiation.

Shepherd University

March 8, 2007

Request for Approval to Implement New Degree Program

Bachelor of Science in
Computer Engineering

Shepherdstown, West Virginia

To begin Academic Year 2007-2008

Summary: The Bachelor of Science in Computer Engineering prepares students for professional positions in computer engineering including such areas as networking, computer architecture and organization, and, more fundamentally, that of computer engineering design and logic. Moreover, the introduction of this program will serve to fulfill the recent calls by various civic and private groups such as the Chamber of Commerce and the Gateway New Economy Council to increase the number of highly skilled workers in the Eastern Panhandle of West Virginia and the Tri-state region.

3.9.1. Program Objective

The Computer Engineering program will teach students to design and build computer systems that meet a wide range of information processing requirements. This involves the analysis, design, and implementation of hardware and/or software for business systems, biometrics system, medical information systems, scientific applications, research, development of prototype robotic systems, and other emerging information technologies.

The course of study will include hardware design and software systems, theory and applications of computers, mathematics, physics, chemistry, electrical signals and circuits, logic design, computer architecture, operating systems, database systems, data communications, microprocessors, computer programming, and artificial intelligence. Students in this program will experience a collaborative learning environment that stresses teamwork, leadership and life skills.

The new Computer Engineering program spans both the electrical engineering and computer science curricula. It draws heavily from each in addition to the specialization in computer engineering. Courses being offered for this program will enhance our existing curricula in all the concentrations of Computer and Information Sciences, (Computer Science, Computer information Systems, and Networking and Data Communications) and other science programs at Shepherd University.

3.9.2. Program Identification

The Computer Engineering program will be identified as ***Computer Engineering, General*** as defined in code [14.0901](#) in the Classification of Instructional Programs (CIP) developed and published by the U.S. Department of Education Center for Education Statistics.

A program that generally prepares individuals to apply mathematical and scientific principles to the design, development and operational evaluation of computer hardware and software systems and related equipment and facilities; and the analysis of specific problems of computer applications to various tasks.

3.9.3. Program Features

3.9.3.1. Admissions and Performance Standards

Students seeking admission into the Computer Engineering program at Shepherd University must meet the general requirements for admission to the University. They also must meet the following requirements for admission into the Computer Engineering program:

- 1) A cumulative high school grade point average (GPA) of 3.00 or better.
- 2) Grades of “B” or better in the following high school courses: Chemistry, Physics, Algebra I and II, Plane Geometry, and Trigonometry.
- 3) Four years of English.

4) Minimum mathematics scores of 24 on the ACT or 510 on the SAT.
 Students not meeting the required coursework listed in sections 3 and 4 above may be admitted to the program after the satisfactory completion of the comparable college level courses.

Students with associate degrees in engineering and computer science from accredited two year institutions will undergo a transcript evaluation to determine eligibility for the program and to identify academic deficiencies. A minimum GPA of 2.75 in previous college work will normally be required.

3.9.3.2 Program Requirements

The proposed comprehensive major in Computer Engineering requires a minimum 128 credits, among which 45 credits must be earned in courses numbered 300 or above.

The computer engineering major spans both electrical engineering and computer science and draws heavily from both disciplines. Students in this major will take fundamental courses in general engineering as well as specialized courses in electrical engineering and computer science.

In the first two years, students will focus on fundamental courses in mathematics and engineering. The advanced courses and technical electives will be taken in the junior and senior year. An engineering capstone course will also be required in the senior year.

The engineering capstone course will include individual efforts along with team projects, project management, and other elements important in real world engineering situations. This course, along with other advanced level courses and technical electives, will prepare students to continue their work in graduate schools.

To graduate with a Bachelor of Science in Computer Engineering, a student must have an overall GPA of 2.5 and a minimum grade of “C” in all core and elective courses.

Table 1: Curriculum for Computer Engineering at Shepherd University

Total hours required (including free electives)	128
General studies requirements. Not including major requirements.....	31
Specific General Studies Requirements.....	16
MATH 207 Calculus 1.....	4
CHEM 207, 207L General Chemistry & Lab.....	4
PHYS 221,221 L General Physics I.....	4
PHYS 222, 222 L General Physics II	4
Concentration requirements	31
Math 100 Freshman Seminar	1
CIS 104 Introduction to Computer and Information Sciences...	3
CIS 211 Computer language Concepts.....	4

CIS 234	Introduction to Networking.....	4
ENGR 326	Linear Systems.....	3
CIS 386	Computer Organization.....	4
CIS 390	Operating Systems.....	3
CIS 421	Computer Architecture.....	3
ENGR 490*	Engineering Capstone Project.....	3
CIS 441	Automata Theory.....	3
* New course		
Math and Engineering requirements.....		32
MATH 208	Calculus II	4
MATH 310	Differential Equations.....	4
MATH 307	Linear Algebra.....	3
MATH 321	Probability and Statistics.....	3
MATH 254	Discrete Mathematics.....	3
ENGR 101	Engineering 1.....	3
ENGR 224, 225	Electrical Circuits.....	4
ENGR 221, 222	Engineering Circuits & Lab.....	4
ENGR 305	Digital Logic & Lab	4
Technical Electives.....		18
CIS 314	Advanced Computer Language Concepts.....	4
CIS 321	Data & File Structures	4
CIS 324	Introduction to Artificial Intelligence.....	3
CIS 431	Algorithms and Data Structures.....	3
CIS 489*	Real Time and Embedded system Design.....	3
CIS 487	Software Engineering	3
ENGR 241	Engineering Statics.....	3
ENGR 242	Engineering Dynamics.....	3
MATH 318	Numerical Analysis	3
MATH 329	Mathematical Modeling.....	3
MATH 409	Complex Variables	3

* New Courses:

ENGR 490 – Engineering Capstone Project - Students work as a part of a team to develop solutions to problems in diverse information engineering area such as biometrics, data mining, scientific database such as biological databases system.
Prerequisite: Permission of instructor.

CIS 489 – Real Time and Embedded System Design – A general introduction to real-time operating system and embedded system design. *Prerequisite CIS 421*

In order to attract quality students from a broad cross section of our service area we need to expand the computing discipline to include engineering. The computer engineering degree will enhance the Computer Information Sciences program at Shepherd University. The department has done extensive planning to create a curriculum that will train our

students at the same level as that found in universities with a tradition of engineering programs.

Our curriculum has been designed by referencing engineering related resources. In particular, close consideration was given to the American Council of Mathematics and the Institute of Electrical and Electronics Engineers (ACM/IEEE) *Computing Curricula Series*, which covers undergraduate programs in Computer Engineering, Computer Science, Information Technology, and Software Engineering. The electronic version is available at

http://www.computer.org/portal/cms_docs_ieeecs/ieeecs/education/cc2001/CC2005

Table 2 and Table 3 show the ACM/IEEE Curriculum Summaries for a Bachelor degree in computer engineering. Our curriculum meets all ACM/IEEE recommendations. Two subjects required in ACM/IEEE based curricula, Signal Processing and VLSI design do not have direct corresponding courses in our curriculum. However, these two subjects are heavily covered in our ENGR 305 and CIS 421, respectively.

Table 2: Comparative emphasis of computing topics in Computer Engineering degree programs. The emphasis values range from 0 (lowest) to 5 (highest).

Knowledge Area	Emphasis	
Programming Fundamentals	4	4
Integrative Programming	0	2
Algorithms and Complexity	2	4
Computer Architecture and Organization	5	5
Operating Systems Principles & Design	2	5
Operating Systems Configuration & Use	2	3
Net Centric Principles and Design	1	3
Net Centric Use and configuration	1	2
Platform technologies	0	1
Theory of Programming Languages	1	2
Human-Computer Interaction	2	5
Graphics and Visualization	1	3
Intelligent Systems (AI)	1	3
Information Management (DB) Theory	1	3
Information Management (DB) Practice	1	2
Scientific computing (Numerical methods)	0	2
Legal / Professional / Ethics / Society	2	5
Information Systems Development	0	2
Analysis of Business Requirements	0	1
E-business	0	0
Analysis of Technical Requirements	2	5
Engineering Foundations for SW	1	2
Engineering Economics for SW	1	3
Software Modeling and Analysis	1	3
Software Design	2	4
Software Verification and Validation	1	3

Software Evolution (maintenance)	1	3
Software Process	1	1
Software Quality	1	2
Comp Systems Engineering	5	5
Digital logic	5	5
Embedded Systems	2	5
Distributed Systems	3	5
Security: issues and principles	2	3
Security: implementation and mgt	1	2
Systems administration	1	2
Management of Info Systems Org.	0	0
Systems integration	1	4
Digital media development	0	2
Technical support	0	1

Table 3: Comparative emphasis of non-computing topics in Computer Engineering degree programs. Emphasis values range from (0) lowest to (5) highest.

Knowledge Area	Emphasis	
Organizational Theory	0	0
Decision Theory	0	0
Organizational Behavior	0	0
Organizational Change Management	0	0
General Systems Theory	0	0
Risk Management (Project, safety risk)	2	4
Project Management	2	4
Business Models	0	0
Functional Business Areas	0	0
Evaluation of Business Performance	0	0
Circuits and Systems	5	5
Electronics	5	5
Digital Signal Processing	3	5
VLSI design	2	5
HW testing and fault tolerance	3	5
Mathematical foundations	4	5
Interpersonal communication	3	4

3.9.4 Program Outcomes

The proposed Bachelor of Science in Computer Engineering is a new degree program. Program outcomes include:

- Graduates will be prepared to meet their professional goals in computer engineering.

- The program will prepare students to pursue their personal journeys as critical thinkers and to be capable of fixing problems independently in their engineering career.
- The program will prepare students for the world of post-graduate education.
- The program will prepare students with theoretical background, hands-on skills, and the self-presentation skills that are essential for a successful engineering career.

3.9.5 Program Delivery

It is intended to have current faculty in the department of Computer Science, Mathematics, and Engineering to teach nearly all the courses in this program. The majority of the curriculum is made up of existing courses currently taught by CME faculty; only three new courses will be added. It is anticipated that demand for several current courses will decline thus allowing faculty teaching those courses to be shifted to the courses in computer engineering.

It is intended to use Shepherd University's existing classrooms and electrical engineering laboratories for instructional delivery. Individual faculty will use various degrees of instructional technology; some courses may be offered online. Collaboration with local industry in the community will be expected. It is expected that as the program develops and demand grows, more advanced technology may prove appropriate.

Section Four: Program Need and Justification

4.1 Relationship to Institutional Goals/Objectives

The Computer Engineering program will support the goals and objectives of Shepherd University in the following ways:

1. First, it will fulfill the University's duty to serve the community by using Shepherd's capabilities and knowledge base to improve the workforce and economic development of West Virginia's Eastern Panhandle and surrounding communities through collaborative arrangements with business, government, and labor.
2. The strong foundation in the established areas of computer science, mathematics and engineering within the School of Natural Sciences & Mathematics supports the establishment of this new degree program. The Computer Engineering degree program will enhance the ability of the faculty to pursue research projects and submit papers in professional publications.
3. The business community in the Eastern Panhandle and the large number of federal agencies operating in the area require graduates in this field to better meet their workforce needs. They are willing to collaborate with the University in developing and placing computer science and engineering students in their organizations.

4. This degree program will integrate with the Shepherd University Research Corporation (SURC) in building links to the business and government facilities located in the Eastern Panhandle.

5. This degree program will provide the homogeneity that would stress interdisciplinary education in the department. We believe this degree will attract to Shepherd University students from the tri-state area who are interested in pursuing engineering careers.

6. The program will enhance the ability of faculty and students to conduct research. The program will create and maintain resources and tools necessary to support successfully research projects, faculty preparation and submission of papers to academic journals and other professional publications.

The Computer Science, Mathematics and Engineering Department designed the pre-engineering curriculum for those students who were pursuing a computer engineering degree. In recent years, several computer engineering and electrical engineering courses have been added to Shepherd's catalog.

4.2 Existing Programs

Currently, no program in Computer Engineering is offered in Shepherd University's service region. West Virginia University (WVU) has a computer engineering program similar to the one being proposed; however, WVU is three hours away from the Eastern Panhandle. Computer Engineering is a common engineering program offered by many state universities like Virginia Tech, University of Maryland-College Park, and The Pennsylvania State University. No university or college within 75 miles of Shepherd University offers this degree program.

4.3 Program Planning and Development

The current engineering program at Shepherd University is a two-year course of study to prepare students to transfer into the third year of a baccalaureate degree program in engineering. This pre-engineering concentration has been very successful in preparing students to complete their engineering baccalaureate degrees at West Virginia University and other institutions. Shepherd's existing program emphasizes a strong foundation in mathematical, physical, computer, and engineering sciences, which constitutes the core of all areas of engineering.

The need for a four-year degree in computer engineering has been an on-going discussion among Dean of the SNSM, the chairs of the Computer Information Science and Mathematics Departments and the departmental faculty for the past several years. These discussions resulted in the creation of the Computer Science, Mathematics and Engineering Department by merging the Mathematics and Engineering department into the Computer Information Sciences Department in 2005.

The merger was followed by recruitment of mathematics faculty prepared in computer engineering. The Computer Engineering program is proposed as an educational experience that draws on the curriculum in the Computer Information Sciences, Mathematics, and Engineering.

This degree program is part of a revamping of the mathematics and computer science majors at Shepherd. The changes include the addition of an Industrial Mathematics major, the proposed addition of a major in Computer Information Technology and increasing the mathematics requirements in computer science. These changes are being made to provide a more educated workforce for the state of West Virginia and the region surrounding Shepherd University.

4.4 Clientele and Need

The Computer Engineering program provides opportunity to recruit and retain students who wish a career in engineering but who also wish to remain at Shepherd University. This program will allow students to complete a degree in an engineering program directly related to the workforce needs in the Eastern Panhandle. Students who wish to remain in West Virginia, but have been unable to pursue the types of opportunities and experiences they require in order to fulfill that desire will now have an option.

The applicant pools that will be specifically targeted by recruitment efforts for this program include, but are not limited, to the following groups:

1. Shepherd University students in the engineering concentration in mathematics and in computer science will be the primary target population. Without this degree program, these students would need to transfer to other institutions and thereby leave the region. These students will be more likely to remain at Shepherd because of familiarity with Shepherd's faculty and curricula as well as the campus and region.
2. New students recruited to Shepherd as mathematics or computer science majors. The program will be actively advertised to high schools to both explain the program and show prospective students that a variety of computer science programs are available in the Eastern Panhandle.
3. Students at local two-year institutions, such as Hagerstown Community College and Blue Ridge Community and Technical College, who wish to continue their studies to achieve a four-year degree. Negotiations have been held with both two-year institutions to coordinate curricula at the two-year institutions so that two-year graduates can transfer into the program and complete a four-year degree with minimal delay.

4.5 Employment Opportunities

Shepherd University's location is ideal for a computer engineering degree program. The region has experienced substantial population growth in the past decade, which has led to increasing job growth. Many of these jobs are in the computer science field and there

has been a strong demand for computer engineers in the information technology industry. The continued integration of computers in a variety of applications will require employees with a strong background in the principles of networking, computer architecture and organization and more fundamentally that of computer engineering design and logic. Moreover, the introduction of this program will serve to fulfill the recent call to attention by various civic and private groups like the Chamber of Commerce and the Gateway New Economy Council to increase the number of highly skilled workers in the Eastern Panhandle of West Virginia and the Tri-state region.

4.6 Program Impact

The Computer Engineering degree program will have minimal impact on programs at Shepherd University outside of those in the School of Natural Sciences and Mathematics (SNSM). Students in mathematics and computer science could move to this degree option if they perceive it as better meeting their needs and providing more job opportunities.

4.7 Cooperative Arrangements

Cooperative arrangements will be a major component in the degree program. Currently, the CME department places student interns in many facilities in the region such as Coast Guard, the Veterans Administration, and the Internal Revenue Service. There is also an extensive network of cooperative arrangements with local business. It is anticipated that both of these programs will increase.

4.8 Alternatives to Program Development

The creation of an applied science degree was discussed within the SNSM. It was not pursued because it was determined there was little interest in applied science degrees in biology, chemistry or environmental studies, it would be hard to establish relationships with local two-year institutions in these areas, Shepherd's capability of providing the necessary courses in these areas was limited. The only department for which an applied science degree was feasible was computer science. This decision was supported by the inclusion in the mathematics curriculum of the Industrial Mathematics major. Further study revealed that a degree in computer engineering had more potential than a degree in applied science. For all of these reasons, the creation of a computer engineering degree was pursued.

Section Five: Program Implementation and Projected Resource Requirements

5.1 Program Administration

The Computer Engineering Program will be housed in the Department of Computer Science, Mathematics and Engineering in the School of Natural Sciences and Mathematics and may involve faculty from Computer and Information Sciences, Engineering, Mathematics, and other science programs at Shepherd University.

Administrative support and oversight for the program will be provided by the School of Natural Sciences and Mathematics.

5.2 Program Projections

	<u>Year 1</u> (2007)	<u>Year 2</u> (2008)	<u>Year 3</u> (2009)	<u>Year 4</u> (2010)	<u>Year 5</u> (2011)
Number of Students Served through Course Offerings of the Program:					
Headcount	2	2	2	2	2
FTE:	0.4	0.4	0.4	0.4	0.4
Number of student credit hours generated by courses within the program (entire academic year):	12	12	12	12	12
Number of majors:	2	3	5	7	9
FTE Majors:	2	3	5	7	9
Number of student credit hours generated by majors in the program (entire academic year)	60	90	150	210	270
Total credit hours generated (entire year)	72	102	162	222	282
Number of degrees to be granted (annual total):	0	0	0	2	3

Assumptions:

A small number of students, here estimated at 2 per year taking 12 credit hours, will take courses in the major who are not computer engineering majors.

All majors will be full-time students.

80% of the students will be in-state and 20% will be out-of-state.

5.3 Faculty Instructional Requirement

The core of any quality program begins with qualified faculty. Shepherd University has a highly experienced faculty with terminal degrees in computer science and electrical engineering. All but two members of the CME Department have doctorates in computer

science, mathematics or engineering. Further, several faculty holding doctorates have master's degrees in engineering. Several possess extensive experience working in the professional sector. Shepherd University also has access to adjunct faculty members with extraordinary qualifications in some areas of engineering. Therefore, the faculty cost associated with the program will be minimal. See APPENDIX B for curriculum vitae.

No full-time faculty lines are dedicated to the program as the courses offered are part of other majors offered by the CME Department. The use of faculty overloads and adjunct faculty will be present in year one. See APPENDIX C.

5.4 Library Resources and Instructional Materials

The Shepherd University library currently subscribes to selective IEEE and ACM periodicals. There is no charge to the campus community for on-line searching. There are hundreds of CD-ROMs available through the Federal Depository Library Program. There are 23 Internet-accessible computers for public use located within the library.

Professional librarians are available for reference service for a total of 77 hours a week. Bibliographic instruction classes, tours, orientations and workshops are important services in addition to teaching students one-on-one. An InFocus projection system is employed to enhance instruction. Librarians also teach a two-hour course entitled "Information Research Methods." The library is open 87.5 hours a week.

Library staff includes a Dean of Libraries, four full-time librarians and six part-time reference librarians, nine full-time paraprofessionals, one part-time paraprofessional, and student work-study employees.

Full subscription to IEEE and ACM online digital library is pending and will be available when computer engineering program gets launched. To this end the budget includes \$1000 during the first year and incremental increases each year thereafter to purchase the required materials.

5.5 Support Service Requirements

Currently, all faculty members involved in the Computer Engineering program have a computer in their offices with Internet access and software that is needed for classroom instruction, testing and scholarly pursuits. Every faculty member has a private phone with voice mail capability. There is extensive secretarial support to aid with scanning tests, making copies and producing transparencies. Every classroom that will be used in the program features Internet access and projectors, and equipment can easily be delivered to each classroom for an instructional period. Many faculty members, for example, use PowerPoint presentations or other ancillary materials that come with the textbook.

There are four computer Laboratories in the Department of Computer Science, Mathematics and Engineering. One of these laboratories is equipped with "smart board" technology. A grid computing environment and programmable robots are available in

computer laboratories for students to explore the “cutting-edge” computer engineering area. These laboratories are used for classroom instruction as well as student use. Additional computers are available on campus in libraries and campus wide laboratories in White Hall.

These instructional resources are adequate to the needs of the proposed computer engineering program and will not require substantial enhancement before the program can begin. The budget includes expenditures in years 2 through 5 for the purchase of educational equipment as the need increases.

Shepherd University’s existing computer network and computer laboratories are adequate to incorporate the additional student enrollment that will be generated by this program. Additional computers and laboratory facilities will be created as enrollment grows and are budgeted for in years 2 through 5.

5.6 Facilities Requirements

The courses offered by Computer Engineering will have a minimal impact on space utilization and scheduling at Shepherd University and can be easily accommodated with existing classroom space.

5.7 Operating Resource Requirements

See APPENDIX C.

5.8 Source of Operating Resources

All operating resources for the program will be generated through student tuition and fees. SEE APPENDIX C.

Section Six Operating Existing Programs at New Location

Not applicable.

Section Seven Program Evaluation

7.1 Evaluation Procedures

The Computer Engineering program will undergo programmatic review under the established program assessment requirements of the University. These requirements include maintaining accurate assessment records and continual monitoring of the program by both the CME Department and the School of Natural Sciences and Mathematics.

The Computer Engineering program will also be evaluated to ensure compliance with standards established by the Higher Learning Commission of the North Central Association of Colleges and Schools and the standards established by the Council for the Advancement of Standards in Higher Education.

Curriculum will be assessed by faculty annually to ensure that the program goals are being met. Students will also have an opportunity to assess both classes and faculty. In addition, an annual survey will be completed to track the success of graduates and to maintain a viable connection with alumni. All of these measures will help to ensure that the program curricula objectives and goals and ever-changing student needs are met.

7.2 Accreditation Status

Not applicable

Section Seven: Program Evaluation

7.1 Program Evaluation.

The Department is committed to provide high-quality programs in computer engineering. The goals of the Department of Computer Science, Mathematics and Engineering are consistent with the University goals and those of the School of Natural Sciences and Mathematics.

The program will also seek accreditation with the Accreditation Board for Engineering and Technology.

As described in Section 3.9.3.2, our curriculum is designed by examining the latest ACM/IEEE *Computing Curricula Series (CC2005)*. It meets all ACM/IEEE recommendations. The department will evaluate this curriculum every five years to reflect changes occurring in computer engineering area.

The assessment measures and the ways to implement them will be submitted to the Office of Teaching and Learning at Shepherd University. Those measures are focused on the core curriculum as well as making sure that graduates develop depth and understanding of computer hardware and related software design and use. These goals will enable them to succeed in graduate school and/or professional employment

In summary, the following set of methods will ensure our achievements in all area of assessments.

- 1) The department will assess its curriculum every year.
- 2) Students will evaluate each course.
- 3) The department will perform an annual survey to track the success of our graduates and to maintain a viable connection with our alumni.
- 4) The department will evaluate the whole program every five years to ensure that our curriculum is in the forefront of this ever-changing computer engineering area.
- 5) The department will develop early in our engineering curriculum creativity and decision making skills that are critical in engineering designs.

- 6) Our technical electives along with our electives in Humanities and social sciences will ensure stabilities in our students' career.
- 7) We already have required written and oral presentations in some of our courses in computer science, mathematics and engineering as well as our laboratories courses. We will expand this measure into this major as the program grows.
- 8) Our engineering capstone course will include design process, technical computations, and data acquisition.
- 9) We require students to utilize their knowledge in brainstorming, problem solving, and teamwork along with their solid background in computer hardware and software that were introduced in our other engineering classes to undertake a major senior design project.

**APPENDIX A
COURSE DESCRIPTIONS AND
SYLLABI**

APPENDIX B
TEACHING FACULTY

APPENDIX C

ENROLLMENT AND BUDGET PROJECTIONS

	<u>Year 1</u> (2007)	<u>Year 2</u> (2008)	<u>Year 3</u> (2009)	<u>Year 4</u> (2010)	<u>Year 5</u> (2011)
Number of Students					
Served through Course Offerings of the Program:					
Headcount	2	2	2	2	2
FTE:	0.4	0.4	0.4	0.4	0.4
Number of student credit hours generated by courses within the program (entire academic year):	12	12	12	12	12
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FORM 2

Computer Engineering
FIVE-YEAR PROJECTION OF
TOTAL OPERATING RESOURCES REQUIREMENTS*

	First Year (2007)	Second Year (2008)	Third Year (2009)	Fourth Year (2010)	Fifth Year (2011)
FTE POSITIONS					
Administrators	0.1	0.1	0.1	0.1	0.1
Full-time Faculty	0	0	0	0	0
Faculty Overloads	2	2	1	1	0
Adjunct Faculty	2	2	1	0	0
Graduate Assistants	0	0	0	0	0
Other Personnel:					
Clerical Workers	0	0	0	0	0
Professionals	0	0	0	0	0

Note: Include percentage of time of current personnel

OPERATING COSTS (Appropriated Funds Only) (5)

Personal Services:					
Administrators	6000	6000	6000	6000	6000
*Full-time Faculty	0	0	0	0	0
Faculty Overloads	1500	1500	750	750	0
Adjunct Faculty	6000	6000	4000	2000	2000
Graduate Assistants	0	0	0	0	0
Non-Academic Personnel	0	0	0	0	0
Clerical Workers	0	0	0	0	0
Professionals	0	0	0	0	0
Total Salaries	13,500	13,500	10,750	8,750	8,000
Current Expenses:	0	0	0	0	0
Total Current Expenses	13,500	13,500	10,750	8,750	8,000

**FIVE-YEAR PROJECTION OF
TOTAL OPERATING RESOURCES REQUIREMENTS***

	First Year (2007)	Second Year (2008)	Third Year (2009)	Fourth Year (2010)	Fifth Year (2011)
Repairs and Alterations:	0	0	0	0	0
Total Repairs & Alterations	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Equipment:					
Educational	0	1000	1000	2000	2500
Equipment	0	1000	2000	2000	2500
Library Books	1000	2000	3000	4000	4000
Total Equipment	<u>1000</u>	<u>4000</u>	<u>6000</u>	<u>8000</u>	<u>9000</u>
Nonrecurring Expense:	0	0	0	0	0
Total Nonrecurring expense	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total Operating Costs	<u>14,500</u>	<u>17,500</u>	<u>16,750</u>	<u>16,750</u>	<u>17,000</u>

SOURCES

General Fund Appropriations: Appropriated Funds Only	0	0	0	0	0
Federal Government: Non-appropriated Funds Only)	0	0	0	0	0
Private and Other:	0	0	0	0	0
Tuition	17006	24092	38264	52436	66608
Total All Sources					
Overhead to the University	2506	6592	21514	30922	49608

Tuition based on \$177 in-state and \$473 out-of-state.