UNDERGRADUATE CURRICULUM COMMITTEE
NEW PROGRAM/PROGRAM CHANGE PROPOSAL FORM

1. Which category (categories) best describes the curriculum change for this proposal:

- Newly established degree program
- Newly established major
- Newly established minor
- Newly established track/concentration/emphasis/certificate within an existing program
- Newly developed program offering no major or minor
- **Significant changes to an existing program's major/minor/ track/concentration/ emphasis/certificate**
- Termination of an existing program/major/minor/concentration/certificate/emphasis

2. Title of Program:

Bachelor of Science Degree in Computer Engineering

Catalogue Description (including credits): (Required only for new catalogue descriptions or changes to current catalogue descriptions)

THE BACHELOR OF SCIENCE DEGREE IN COMPUTER ENGINEERING

The Bachelor of Science degree in Computer Engineering is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET). Computer Engineering encompasses design and analysis of both hardware and software systems. Engineering problem solving, a key component of our Computer Engineering program, is practiced in all areas studied for this degree. Computer Engineering is the application of knowledge and technology to the exciting, challenging, and ever-changing field of computer systems. Computer Engineering majors are prepared for employment in positions such as Digital Design Engineers, Software Systems Analysts, Computer Architects, Scientific and Technical Programmers, Microprocessor-based Systems Designers, Instrumentation Systems Designers, Integrated Circuit Designers, and Systems Engineers.

The educational objectives of the Computer Engineering Program are to produce graduates possessing:

1. a thorough understanding of one or more of the following areas:
   - design of digital systems
   - computer architecture
   - software engineering
   - microprocessor control of systems
   - data acquisition and signal processing;
2. the knowledge and skills to advance in a dynamic technological environment and to succeed in advanced study;
3. a strong liberal arts background and the ability to communicate well orally and in writing;
4. the abilities to develop new knowledge and new skills, to analyze and solve problems creatively, and to serve in a variety of roles such as a responsible team member or an effective team leader.

The major in computer engineering focuses on an applied approach. There is a comprehensive laboratory component to provide hands-on experiences. Computers are used throughout the curriculum as part of the engineering design process. Commercial EDA (Electronic Design Automation) software is used extensively. In addition to requiring successful completion of all general education and degree studies requirements (see index), the major in computer engineering requires successful completion (a grade of *C*- or better) of the following courses in major and elective studies:

1) ECON 201G*or 202G*;
2) CHEM 121/121L*-122*;
3) PHYS 201/201L*-202/202L*, 340, 341;
4) MATH 140*, 240, 320;
5) ENGR 121, 211/211L-212/212L, 213;
6) CPEN 214, 315/315L, 371W, 414, 431, 499W;
7) CPSC 125, 150/150L-250/250L, 260, 270, 410, 427;
8) Six hours from professional electives: CPEN 422, 495, CPSC 420, 425, 440, 450, 470, 471, 480, 495, PHYS 421, PCSE 495 (only one 495 course allowed with advisor's permission); CPSC 501 and 502 (with advisor's permission).

* Courses bearing an asterisk may be used simultaneously to satisfy, in part, certain general education and degree

studies requirements.

Because of the tight prerequisite structure, it is strongly recommended that students take their major courses in the following order:

First year: ENGR 121, MATH 140*-240, PHYS 201/201L*-202/202L*, ENGL 123, CPSC 125,, 150/150L;
Second year: CPSC 250/250L, CPSC 270, ENGR 211/211L-212/212L, 213, MATH 320, CPEN 214, 315/315L, ENGL 223;
Third year: CPEN 414, 371W, CPSC 427, , CPSC 260, PHYS 340, PHYS 341;
Fourth year: CPEN 431, CPSC 410, CPEN 499W, CHEM 121/121L-122, two professional electives.

3. What are the objectives for this program?

Quoting from the catalog copy above: "The educational objectives of the Computer Engineering Program are to produce graduates possessing:

1. a thorough understanding of one or more of the following areas:
    - design of digital systems
    - computer architecture
    - software engineering
    - microprocessor control of systems
    - data acquisition and signal processing;
2. the knowledge and skills to advance in a dynamic technological environment and to succeed in advanced study;
3. a strong liberal arts background and the ability to communicate well orally and in writing;
4. the abilities to develop new knowledge and new skills, to analyze and solve problems creatively, and to serve in a variety of roles such as a responsible team member or an effective team leader."

4. For whom is the new curriculum primarily intended? Explain why it should become part of the curriculum, and how this proposal relates to the University's mission.

This is a minor change to the requirements for the Major in Computer Engineering.

5. What is the anticipated enrollment in the new curriculum for the next three years?

Roughly the same as currently, or approximately 15-20 graduating majors per year.

6. How will the new curriculum be staffed/administered?

No staffing changes are needed, as the curriculum changes are very minor.

7. Has this curriculum, or one closely related to it, been offered at CNU previously?
If so, is that curriculum currently being offered? How does the proposed curriculum differ? When is the last term the old curriculum will be offered?

Yes, this exact major has been offered at CNU for many years. We are submitting this program change proposal to the UCC as we are proposing four minor changes to the program. The first is substitution of PHYS 341 (Design and Analysis of Experiments – a new course but already approved by the UCC) for MATH 335 (Probablility and Statistics), which was criticized by ABET for not having containing enough material on statistics and experimental design. This is in fact why the new course, PHYS 341, was created. The second change is the susbstitution of CPSC 427 (C++ Programming – a new course but already approved by the UCC) for CPSC 480 as a required course, and the moving of CPSC 480 to the list of optional electives. This was done because our CE majors really need to know C++ in addition to Java. Note that these changes do not involve any change in the number of required hours for the major.

The final two changes involve removing two courses from the list of required courses. This was deemed necessary as under the new curriculum the number of hours required for this major would have jumped from 123 to 130. With these two courses (six hours) removed, the major hour requirement is cut back to 124. We are proposing to removing COMM 201 and CPSC 420 as required courses. The rationale for the removal of COMM 201 is that our students are asked to prepare oral preparations in four courses, ENGR

121, CPEN 371, CPEN 431, and CPEN 499 W. We believe this is sufficient to satisfy the ABET requirements for oral communication. CPSC 420 is a very theoretical course in computer science, and while it is essential material for a computer scientist, we believe it is less essential for a computer engineer. This course has been moved into the list of available electives for the CE major.

8. Does the new curriculum or the change being proposed involve the creation of new courses, deletion of existing courses, or changes to existing courses? Please briefly list all changes here and indicate how these changes affect hours required for graduation.

For EACH new course being proposed, please complete the Undergraduate Curriculum Committee New Course Proposal Form and attach to this form. Remember to include a syllabus for each proposed course.

The only new courses involved are CPSC 427 and PHYS 341, both of which have already been approved by the UCC.

9. Does the new curriculum involve special equipment or costs? If so, please explain.
No.

This program was reviewed by: ***(Areas of Inquiry must be approved by BOTH academic Deans and both Curriculum Cttees)***	***Concur***	***Do Not Concur*****
Department(s): (1) _____ Date: _____	☐	☐
Department(s): (2) _____ Date: _____	☐	☐
CLAS Chairs: _____ Date: _____	☐	☐
SoB Curriculum Committee: _____ Date: _____	☐	☐
Dean: _____ Date: _____	☐	☐
Dean: _____ Date: _____	☐	☐
University Curriculum Committee: _____ Date: _____	☐	☐
Faculty Senate: _____ Date: _____	☐	☐
Provost: _____ Date: _____	☐	☐

President: _____ Date: _____

Board of Visitors: _____ Date: _____

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Distribution by the Provost Office following approval:
Department Chair(s), UCC Chair, Deans, Registrar

***If "Do Not Concur" is checked, please provide a statement of explanation.*

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