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THE UNIVERSITY OF NORTH CAROLINA
Request for Authorization to Establish a New Degree Program

INSTRUCTIONS: Please submit five copies of the proposal to the Senior Vice President for Academic Affairs, UNC Office of the President. Each proposal should include 2-3 page executive summary. The signature of the Chancellor is required.

Date: December 17, 2003

Constituent Institution: Western Carolina University and The University of North Carolina at Charlotte
CIP Discipline Specialty Title: Electrical, Electronics, and Communications Engineering
CIP Discipline Specialty Number: 14.1001 Level: B X M __ 1st Prof __ D __
Exact Title of the Proposed Degree: Electrical Engineering
Exact Degree Abbreviation (e.g. B.S., B.A., M.A., M.S., Ed.D., Ph.D.): B.S.
Does the proposed program constitute a substantive change as defined by SACS? Yes X No __
a) Is it at a more advanced level than those previously authorized? Yes __ No X
b) Is the proposed program in a new discipline division? Yes X No __
Proposed date to establish degree program (allow at least 3-6 months for proposal review):
m*onth* August *year* 2004
Do you plan to offer the proposed program away from campus *during the first year of operation?*
Yes ____ No __X__ (Joint degree program partially offered through distance learning)
If so, complete the form to be used to request establishment of a distance education program and submit it along with this request.

I. Description of the Program

A. Describe the proposed degree program (i.e., its nature, scope, and intended audience).

Western Carolina University (WCU) and The University of North Carolina at Charlotte (UNC Charlotte) will offer a Joint B.S. degree in Electrical Engineering (BSEE). The degree program will follow the UNC Charlotte electrical engineering curriculum, which is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (EAC/ABET). WCU and UNC Charlotte will seek accreditation from ABET for the joint program.

Since UNC Charlotte already is authorized to offer the BSEE degree and holds ABET accreditation, this document does not go into detail concerning the facilities, faculty and university requirements, etc. of that institution. Rather, the focus is on the impact of the joint program and the readiness of WCU to collaborate in the joint program.

For purposes of program administration, the Dean of Engineering at UNC Charlotte and the Dean of the College of Applied Sciences at WCU or a designee of the Chief Academic Officer at each institution will be responsible for appointing a campus director for the joint program. The directors will be responsible for the program operation and accreditation. The constituent faculties of the Joint Program at WCU and UNC Charlotte will hold adjunct rank at the collaborating institution. Program directors, in consultation with their appropriate deans, will appoint a minimum of three faculty at their respective institutions to serve as a Joint Faculty Curriculum Committee. (JFCC). The JFCC will have responsibility for

recommending to the Joint Program Faculty curriculum, program objectives and outcomes, admission standards, assessment methodology, and standards for student progression and graduation. Selected EE courses will be delivered by both WCU and UNC Charlotte faculty using distance delivery systems supported by online technology to students on the two campuses. Selected EE courses will be taught on-site by WCU faculty. Remote sites will support students with on-site supplemental instruction by qualified content experts approved by the Program Directors. Each institution will support the program with qualified technical staff. Liberal studies, mathematics, and sciences courses will be taught on-site by WCU faculty using existing courses. A Memorandum of Understanding between the two universities is under development.

Admission standards to the program shall be determined by the Joint Faculty and implemented by an admissions committee at each campus. Program admission requirements will be those used by the UNC Charlotte Engineering Program at the point the program is implemented. Students admitted to the joint program will have a designated home institution, usually the institution at which general education requirements are completed. Joint program students are eligible to enroll in program courses offered at either institution and are eligible to enroll in other courses on a space available basis. The primary audience of the Joint Program will be students who enroll at WCU as freshmen. Students who wish to major in EE will be enrolled in the Freshman Engineering Program. Upon successful completion of this program and satisfaction of the progression requirements, they will be transferred to the EE program. The program will also accommodate graduates of Associate in Applied Science college transfer programs. Students from two year Associate in Applied Science programs who wish to transfer to EE, will have to fulfill necessary prerequisites, e.g., mathematics and sciences. In order to enter the EE program, all students regardless of their previous academic background must complete successfully the Freshman Engineering Program.

The two institutions will develop a plan to address tuition and fees that will minimize any differential that might exist between a student enrolled full time in this joint program through a combination of WCU and UNC Charlotte courses and the cost for a student to be enrolled full time at the home institution. The student's tuition and fees will be a combination of tuition for courses at the home institution and the corresponding distance education tuition for courses taught remotely. Jointly enrolled part time students (resident credit or distance education credit) will pay tuition and fees to the applicable institution granting the academic credit.

Using the approved UNC CIP course codes, WCU and UNC Charlotte will each report actual student credit hours delivered by their faculty to students enrolled in the joint engineering degree program.

Four Year Course Sequence

Fall			**Spring**		
ENGR 191	Eng/Prac/Prin. I	(2)	ENGR 192	Eng/Prac/Prin. II	(2)
MATH 1zz	Eng. Calc. I **(C2)**	(3)	MATH 2xx	Eng. Calc. II	(3)
CHEM 132	Intr. Chem. **(C5)**	(4)	PHY 230	Gen. Physics **(C5)**	(4)
ENGL 101	Composition I **(C1)**	(3)	ENGL 102	Composition II **(C1)**	(3)
Social Sciences	**(P1)**	(3)	Social Sciences	**(P1)**	(3)
		15			15
EE 211	Network Theory I	(3)	EE 212	Network Theory II	(3)
EE 200	Comp. Util. in C++	(3)	EE 222	El. Eng. Design I	(2)

EE 221	Logic Sys. Design. I	(3)	EE 202	Instr/Ntwks Lab	(1)
EE 201	Logic/Ntwks Lab	(1)	Oral Communications	**(C3)**	(3)
MATH 2yy	Eng. Calc. III	(3)	MATH 320	Ord. Diff. Equations	(3)
PHY 2xx	Fund. Optics/Matls	(3)	PHY 310	Modern Physics	(3)
		16			15

EE 311	Signals/Systems	(3)	EE 322	Solid State Micro	(3)
EE 341	El. Eng. Design II	(2)	EE 332	Electronics	(3)
EE 331	Fund. El/Semicond.	(3)	EE 342	E-M Waves	(3)
EE 321	Intr. to E-M Fields	(3)	EE 302	E-M/Devices Lab	(1)
ENGR 300	Prof. Dev.	(1)	MATH 370	Prob/Statistics	(3)
EE 301	Sys/Electronics Lab	(1)	Humanities	**(P4)**	(3)
Fine/Perf Arts	**(P5)**	(3)			
		16			16

EE 411	Senior Design I	(2)	EE 412	Senior Design II	(3)
EE 421	Comm. Theory	(3)	Science Elective		(3)
EE 4XX	Elective	(3)	EE 402	El. Eng. Prof. Prac.	(2)
Tech. Elec. ……		(3)	Tech. Elec. ……		(3)
World Cultures	**(P6)**	(3)	Tech. Elec. ……		(3)
Wellness	**(C4)**	(3)	History	**(P3)**	(3)
		17			17

Note: Courses indicated by designations in bold such as **P6** fulfill the liberal studies component.

The course listing below identifies the courses in the EE major and how the courses will be distributed between the two institutions.

EE Major Course Responsibility

	UNC Charlotte	**WCU**
ENGR 191 Introduction to Engineering Practice & Principles I, 2 hours		x
ENGR 192 Introduction to Engineering Practice & Principles II, 2 hours		x
ENGR 300 Professional Development, 1 hour	x	
EE 200 Computer Utilization in C++, 3 hours	x	
EE 201 Logic and Networks Lab, 1 hour		x
EE 202 Instrumentation and Networks Lab, 1 hour		x
EE 211 Network Theory I, 3 hours		x
EE 212 Network Theory II, 3 hours		x
EE 221 Logic System Design I, 3 hours	x	
EE 222 Electrical Engineering Design I, 2 hours	x	
EE 301 Systems and Electronics Lab, 1 hour		x
EE 302 E-M and Electronic Devices Lab, 1 hour		x

EE 311 Signals and Systems, 3 hours		x
EE 321 Introduction to Electromagnetic Fields, 3 hours	x	
EE 322 Solid State Microelectronics I, 3 hours	x	
EE 331 Fund. of Electronics/Semiconductors, 3 hours	x	
EE 332 Electronics, 3 hours		x
EE 341 Electrical Engineering Design II, 2 hours	x	
EE 342 Electromagnetic Waves, 3 hours	x	
EE 402 Electrical Engineering Prof. Practice, 2 hours	x	x
EE 411 Senior Design I, 2 hours	x	x
EE 412 Senior Design II, 3 hours	x	x
EE 421 Communication Theory, 3 hours	x	
EE 4xx Senior Elective, 3 hours	x	x
Technical Elective	x	x
Technical Elective	x	x
Technical Elective	x	x

UNC Charlotte uses a ECGR prefix for the electrical engineering courses. Parallel courses offered by WCU will carry the prefix of EE and ENGR. The course title, course description, and course outline as used by UNC Charlotte will be used in the EE program at WCU. For example, ECGR 2111 Network Theory I at UNC Charlotte is the same as EE 211 Network Theory I at WCU.

B. List the educational objectives of the program.

The Program Educational Objectives are the same as in the BSEE program at UNC Charlotte:

- Provide students the opportunity and the environment to acquire the educational background necessary to pursue professional careers in Electrical Engineering and/or to continue their education toward an advanced degree in the field.

- Provide graduates who have a comprehensive background in mathematics, physical and social sciences, liberal arts, and human values, with in-depth knowledge of the fundamentals of engineering science and Electrical Engineering that perpetuates life-long learning.

- Provide graduates with the tools to pursue successful and long careers in the profession that places ethical conduct as paramount.

- Prepare graduates who can effectively communicate their thoughts and ideas to their surroundings along with the understanding of the impact of Electrical Engineering on global, societal, and environmental issues.

- Provide graduates who have state-of-the-art computer skills suitable for a modern career in Electrical Engineering, where computer utilization is an essential tool.

C. Describe the relationship of the program to other programs currently offered at the proposing institution, including the common use of: (1) courses, (2) faculty, (3) facilities, and (4) other resources.

At WCU, the BSEE will be housed in the Department of Engineering Technology. A proposal will be forthcoming in Fall 2003 to change the name to Department of Engineering and Technology when the EE program is approved by the Board of Governors. Currently, the department offers undergraduate programs in Electrical and Computer Engineering Technology, Telecommunications Engineering Technology, Manufacturing Engineering Technology, Engineering Technology, Industrial Distribution, and Construction Management. A Master of Science degree in Technology is also offered by the Department. The ECET and MET program are TAC of ABET accredited.

With regard to the major courses in EE, qualified faculty from both WCU and UNC Charlotte will share the instruction and form a joint faculty for this program. WCU will conduct nationwide searches to secure faculty who are EAC/ABET qualified to teach the on-site EE courses. Liberal studies, mathematics, and sciences courses will be taught using existing WCU faculty and resources.

The department maintains 14 laboratories for instruction. Five of these laboratories are dedicated to electrical and telecommunications engineering technology. All are equipped with modern computers for simulation exercises. Other laboratories are used for engineering computing graphics, rapid prototyping, manufacturing automation, machining, and metrology. A new building, the Center for Applied Technology, will be available for occupancy during fall 2003, and will provide four of the 14 laboratories with approximately 15,000 square feet and two additional classrooms.

The Department received an award ($4.7 million dollars) which is being administered by the Defense Advanced Research Projects Agency (DARPA). Approximately seventy percent of this award is being allocated to the acquisition of new equipment and infrastructure items to up-date existing electrical laboratory space and technology. New instrumentation and computers (including engineering workstations) have been purchased that will improve testing capabilities and provide for the integration of computer-based testing and measurement.

Two new laboratories are being created for photonics and optoelectronics using DARPA resources. Equipment is being specified that will provide for undergraduate experiences with fiber optics, optical communication, and optical sources and detectors. Additional equipment is being purchased to support research on optical transceiver transmission rates and related bit error ratio testing. The technical electives in the EE program will focus on the area of optoelectronics.

II. Justification for the Program – Narrative Statement

A. Describe the proposed program as it relates to:

1. the institutional mission and strategic plan

   WCU is a comprehensive university within the University of North Carolina, offering a broad array of undergraduate and graduate programs in the arts, sciences, and professions. Teaching and learning constitute the central mission. The primary service area is western North Carolina. Development of engineering programs has been part of the WCU Strategic Vision statement for many years. (See planning.wcu.edu/planning/html)

   At the March 21, 2003 Board of Governors of the UNC System meeting, the President of the UNC System recommended that "discussions should be initiated immediately between UNC Charlotte and WCU to explore the extension of UNC Charlotte's baccalaureate programs in electrical and computer engineering to the WCU campus, with the goal of establishing a joint degree between the two campuses in one or both of these areas."

At the April 11, 2003 meeting, the Board of Governors approved a process for joint programs to allow interaction between UNC Charlotte and WCU. The joint degree program must be approved through the regular institutional processes and have the approval of the Chancellor of each university prior to submission to the Board of Governors.

The following processes must have been certified for the joint degree program:

a. Admission process
b. Registration and enrollment process for students
c. Plan for charging and distributing tuition and fees
d. Management of transcripts and permanent records
e. Participation in graduation
f. Design of diploma

Each student who will receive a joint degree must be approved by the institutional process for certifying a student to receive a degree by each UNC institution whose name will appear on the diploma.

A Memorandum of Understanding between the two universities that details the operational aspects of the joint degree program is under development. The memorandum contains information regarding program administration, academic requirements, admissions processes, registration procedures, finances, tuition, and fees, program accreditation/assessment, and library.

2. student demand

The demand for an engineering program at Western relies on several factors. The Enrollment Planning Service (EPS) through the College Board has basic data on intended majors of high school students who take the SAT. Of all 2001-2002 SAT test takers in North Carolina, 3,421 students (7%) indicated their intended major is Engineering. Of the students who took the test in 2001-2002 and had their scores sent to Western, 242 (6% of received scores) indicated their intended major was Engineering.

In December 2000, Advantage West-North Carolina, the Western North Carolina Regional Economic Development Agency, commissioned *Market Street Services, Inc.* a community and economic development consulting firm based in Atlanta, Georgia, to facilitate and develop a Workforce Development Plan for the central 10-county region of AdvantageWest. The project looked at three areas: labor market assessment, workforce development resources, and workforce development plan. (See http://www.awnc.org/)

Several statements in the study pointed to the need for engineers in the region.

> The most difficult workers to find were manufacturing or skilled workers with 76% of employers saying they had some or great difficulty in finding qualified workers. Fifty-two percent of employers had some or great difficulty in finding supervisory or managerial personnel, and IT professionals, engineers, or analysts. The easiest workers to find were clerical, administrative, or secretarial workers. (p. 10)
>
> While the region has experienced significant amounts of in-migration, these are mostly older individuals who may or may not participate in the labor force. Efforts should be made to retain the skilled workers within the region, particularly graduates from area colleges and

universities, young adults who have gone away to attend college and have graduated, as well as alumni, with targeted skill sets across all industry sectors to live and work in the region. (p. 30)

Western Carolina University is a significant element in the economic development of the western North Carolina region, particularly, in educating young people from the region in engineering. The Center for Integrated Technologies (housed in the Center for Applied Technology) in conjunction with an engineering program has the capability of fostering economic development for the region.

Data from the Bureau of Labor Statistics (BLS) clearly indicates that there is a need for additional electrical engineering graduates in North Carolina and surrounding states. Indeed, the number of graduates from the three state institutions does not meet the projected demand as stated by the BLS. (See Section II.A.3)

3. societal need (For graduate, first professional, and baccalaureate professional programs, cite manpower needs in North Carolina and elsewhere.

   The following information is occupational projections for electrical and electronic engineers as published by the Bureau of Labor Statistics. (http://almis.dws.state.ut.us/occ/projhome.asp)

   Manpower needs are cited for North Carolina, surrounding states of South Carolina, Tennessee, Georgia, and for the United States.

State	Title	1998 Employment	2008 Employment	Quantity Employment Change	Average Annual Openings	Percent Employment Change
North Carolina	Electrical and electronics engineers	7700	9650	1950	360	25

It is quite evident that the projected average annual openings in North Carolina for electrical engineers (360) exceeds the combined number of graduates from North Carolina State University, North Carolina Agricultural and Technical State University, and UNC Charlotte. For example, in 2001-2002, these three universities graduated a total of 212 electrical engineers. (See Section C – Enrollment)

State	Title	1998 Employment	2008 Employment	Quantity Employment Change	Average Annual Openings	Percent Employment Change
South Carolina	Electrical and	2650	3250	600	120	22

	electronics engineers					

State	Title	1998 Employment	2008 Employment	Quantity Employment Change	Average Annual Openings	Percent Employment Change
Tennessee	Electrical and electronics engineers	3850	4600	750	160	19

State	Title	1998 Employment	2008 Employment	Quantity Employment Change	Average Annual Openings	Percent Employment Change
Georgia	Electrical and electronics engineers	7450	10700	3250	480	44

State	Title	1998 Employment	2008 Employment	Quantity Employment Change	Average Annual Openings	Percent Employment Change
United States	Electrical and electronics engineers	354250	446250	92000	16750	26

A related area of employment for engineers is as managers. While the data below does not specifically cite electrical engineers, it does provide some insight into the general need.

State	Title	1998 Employment	2008 Employment	Quantity Employment Change	Average Annual Openings	Percent Employment Change
North Carolina	Engineering, natural science, and computer and information systems managers	8500	11950	3450	500	41

4. impact on existing undergraduate and/or graduate academic programs of your institution. (e.g., Will the proposed program strengthen other programs? Will it stretch existing resources? How many of your programs at this level currently fail to meet Board of Governors' productivity criteria? Is there a danger of proliferation of low-productivity degree programs at the institution?)

   There is no negative impact on undergraduate programs at Western due to this proposed electrical engineering program. There will be some impact associated with the Joint Program on faculty at UNC Charlotte. Distance course offerings require additional preparation time, time to interact with students and additional work in evaluation of learning. This increases faculty duties and necessitates the addition of faculty to ensure program success. Also, the coordination of the programs will require a dedicated director on both campuses. This will impact the teaching load of the program director.

   The proposed program will strengthen both the mathematics and sciences areas. Additional enrollment in higher level mathematics and physics courses will occur. Existing resources are sufficient to handle this increased enrollment.

   Typically, some 30-35% of entering freshmen in engineering programs complete the degree. At Western, those who have enrolled in electrical engineering but desire another degree path, may select the electrical and computer engineering technology program, the telecommunications engineering technology program, or the engineering technology program, which have existing capacity to handle more students.

B. Discuss potential program duplication and program competitiveness.

1. Identify similar programs offered elsewhere in North Carolina. Indicate the location and distance from the proposing institution. Include a) public and b) private institutions of higher education.

   There are no other joint electrical engineering programs using this format in North Carolina. There are several traditional programs which are located at North Carolina State University-Raleigh, University of North Carolina at Charlotte, and North Carolina Agricultural and Technical State University, Greensboro. Duke University, located in Durham, is a private institution which also offers electrical engineering.

The closest institution to Western is UNC Charlotte which is 200 miles from WCU. Both NC State University and Duke are over 300 miles from WCU. NC A & T is approximately 300 miles from WCU.

2. Indicate how the proposed new degree program differs from other programs like it in the University. If the program duplicates other UNC programs, explain a) why is it necessary or justified and b) why demand (if limited) might not be met through a collaborative arrangement (perhaps using distance education) with another UNC institution. If the program is a first professional or doctoral degree, compare it with other similar programs in public and private universities in North Carolina, in the region, and in the nation.

   The proposed electrical engineering program is not a freestanding program at Western. A team of engineering deans was charged by the Board of Governors to determine the need for additional engineering programs in North Carolina. The team recommended that "the faculty and administration at Western Carolina initiate conversations with the School of Engineering at UNC Charlotte to discuss cooperative engineering programs with that institution". (See March 21, 2003 Board of Governors Minutes, Appendix 8)

   A joint electrical engineering program in the western North Carolina region of the state would allow students to stay in that region and also would play a role in much needed economic development. Further, it maximizes the resources from both institutions.

C. Enrollment (baccalaureate programs should include only upper division majors, juniors and seniors).

   Headcount enrollment
   Show a five-year history of enrollments and degrees awarded in similar programs offered at other UNC institutions (using the format below for each institution with a similar program): indicate which of these institutions you consulted regarding their experience with student demand and (in the case of professional programs) job placement. Indicate how their experiences influenced your enrollment projections.

   The programs listed below are traditional four-year electrical engineering programs and not joint engineering programs. The enrollment figures reflect upper division only. The data is for academic years 1999 through 2002. (See UNC-GA ProgAssess/SDF.PR006/28MAY03)

Institution: North Carolina Agricultural and Technical State University
Program Title: Electrical Engineering

	Fall 99	Spr 00	Fall 00	Spr 01	Fall 01	Spr 02
Enrollment	127	118	124	123	121	137

	1999-2000	2000-2001	2001-2002
Degrees-awarded	38	46	43

Institution: University of North Carolina-Charlotte
Program Title: Electrical Engineering

	Fall 99	Spr 00	Fall 00	Spr 01	Fall 01	Spr 02
Enrollment	139	146	124	143	142	143

	1999-2000	2000-2001	2001-2002
Degrees-awarded	42	40	46

Institution: North Carolina State University
Program Title: Electrical Engineering

	Fall 99	Spr 00	Fall 00	Spr 01	Fall 01	Spr 02
Enrollment	406	391	410	404	417	407

	1999-2000	2000-2001	2001-2002
Degrees-awarded	141	139	123

Enrollment projection in the proposed program for four years and the basis for the projections.

	Year 1 (2004-2005)	Year 2 (2005-2006)	Year 3 (2006-2007)	Year 4 (2007-2008)
Full-time	60	116	174	214
Part-time	0	0	0	0
TOTALS	60	116	174	214

The basis for these projections include an attrition rate of 40% of the majors at the end of the first year with 30% of the original majors completing the degree program. The anticipated freshman enrollment is 60 for year 1, 80 for year 2, 100 for years 3 and 4, respectively.

Please indicate the anticipated steady-state headcount enrollment after four years:

Full-time __214__ Part-time __0__ Total __214__

SCH production (upper division program majors, juniors and seniors *only*, for baccalaureate programs).

Project the SCH production for four years. Explain how SCH projections were derived from enrollment projections (see UNC website for a list of the disciplines comprising each of the four categories).

Projected freshman enrollment is 60 for year 1, 80 for year 2 and 100 for years 3 and 4, respectively. It is anticipated that 40% of each freshman class will not continue into the sophomore year and that 30% of the entering freshman class will continue on to graduate from the degree program.

	Total Credits	Y1 enroll.	Y1 SCH	Y2 enroll	Y2 SCH	Y3 enroll	Y3 SCH	Y4 Enroll	Y4 SCH
Freshman Year									
Level 1 credit	20	60	1200	80	1600	100	2000	100	2000
Level 2 credit	0	60	0	80	0	100	0	100	0
Level 3 credit	8	60	480	80	640	100	800	100	800
Level 4 credit	2	60	120	80	160	100	200	100	200
Sophomore									
Level 1 credit	6			36	216	48	288	60	360
Level 2 credit	0			36	0	48	0	60	0
Level 3 credit	6			36	216	48	288	60	360
Level 4 credit	19			36	684	48	912	60	1140
Junior									
Level 1 credit	6					26	156	36	216
Level 2 credit	0					26	0	36	0
Level 3 credit	0					26	0	36	0
Level 4 credit	26					26	676	36	936
Senior									
Level 1 credit	6							18	108
Level 2 credit	3							18	54
Level 3 credit	12							18	216
Level 4 credit	13							18	234
Total credits	127								

All Levels									
Annual Total	Funding Factor	Y1 positions	Y1 SCH	Y2 positions	Y2 SCH	Y3 positions	Y3 SCH	Y4 positions	Y4 SCH
Level 1 credit	643.72	1.9	1200	2.8	1816	3.8	2444	4.2	2684
Level 2 credit	487.37	0.0	0	0.0	0	0.0	0	0.1	54
Level 3 credit	364.88	1.3	480	2.3	856	3.0	1088	3.8	1376
Level 4 credit	230.52	0.5	120	3.7	844	7.8	1788	10.9	2510
Total SCH:Positions		3.7	1800	8.8	3516	14.5	5320	18.9	6624
Total enrolled by year		60		116		174		214	

Junior/Senior Only									
Annual Total	Funding Factor	Y1 positions	Y1 SCH	Y2 positions	Y2 SCH	Y3 positions	Y3 SCH	Y4 positions	Y4 SCH
Level 1 credit	643.72	0.0		0.0		0.2	156	0.5	324
Level 2 credit	487.37	0.0		0.0		0.0		0.1	54
Level 3 credit	364.88	0.0		0.0		0.0		0.6	216
Level 4 credit	230.52	0.0		0.0		2.9	676	5.1	1170
Total SCH:Positions		0.0	0	0.0	0	3.2	832	6.3	1764

III. Program Requirements and Curriculum

A. Program Planning.

1. List the names of institutions with similar offerings regarded as high quality programs by the developers of the proposed program.

   Many universities across the USA, in addition to UNC Charlotte, offer strong high quality electrical engineering programs. The colleges listed below are similar to Western in that they are comprehensive in nature, have similar missions, and have electrical engineering programs.

   University of Wisconsin-Platteville
   University of South Alabama
   University of Evansville
   Western Kentucky University

2. List other institutions visited or consulted in developing this proposal. Also discuss or append any consultants' reports, committee findings, and simulations (cost, enrollment shift, induces course load matrix, etc.) generated in planning the proposed program.

   An "Undergraduate Engineering Study" was concluded in May 2000. The thrust of this study was to determine budget, space requirements, faculty positions, and enrollment projections for both electrical and mechanical engineering programs at peer institutions to Western. Representatives from Western visited Minnesota State University at Mankato, St. Cloud University and Bradley University. Additional information was gathered from UNC Charlotte, Georgia Southern University, and EAC/ABET.

   For the joint program in electrical engineering, a number of traditional program curriculums were reviewed. These included electrical engineering programs at NC State University, Clemson University, Georgia Tech, and Purdue University.

B. Admission. List the following:

1. Admissions requirements for proposed program (indicate minimum requirements and general requirements).

   Applicants to the joint electrical engineering program will meet the general admission requirements of their home institution. WCU and UNC Charlotte are open to all qualified students without regard to race, sex, color, national origin, religion, age, sexual orientation, or disability.

   First-Year Students. Admission to Western Carolina University and placement into courses and programs are based upon a variety of factors including courses taken in high school, rank in class, SAT or ACT scores, and high school grade point average. Applicants must be graduates of accredited high schools. Graduates of unaccredited high schools may satisfy entrance requirements by examination. The university reserves the right to require any conditions deemed necessary. Applications also are considered for admission from prospective

students who have achieved high school graduation equivalency by means of tests of General Education Development (GED).

Applicants to the electrical engineering program at WCU will adhere to the same guidelines as established for these majors at UNC Charlotte.

Freshman admission is competitive. Based upon an overall evaluation of high school record with particular emphasis on advanced course in math and science and test scores, freshmen may be admitted directly to the Freshman Engineering Program. *Transfers* must present a GPA of at least 2.50 and meet the same mathematics requirements as engineering freshmen using either high school or college mathematics courses. All transfers will be admitted to the lower division of the electrical engineering program, and evaluation of transfer credits to the program will be performed by the Registrar and the Department Head. Transfers from an ABET accredited engineering program who do not have a 2.50 GPA may be admitted upon the recommendation of the Department Head.

Mathematics Placement Procedures. All students making application to the electrical engineering program must take a mathematics placement examination to determine the appropriate entry-level mathematics course for them.

Freshman Engineering (FENG) is an individualized advising program for all entering students who intend to major in electrical engineering. Upon successful completion of this first year, the student is transferred to the EE major.

Freshman Year Requirements. All new freshman students are initially advised by a faculty associate in the Department of Engineering Technology. Students are eligible to transfer to the electrical engineering major upon 1) completion of all non-elective courses in their freshman year curriculum with grades of *C* or better, and 2) a minimum cumulative grade point average (GPA) of 2.00 for all courses taken.

Sophomore through Senior Year Requirements. In addition to the home University's requirements for continued enrollment, students must maintain a cumulative GPA in the major of 2.00 for all courses taken within the program. A student is suspended from the electrical engineering program when the student fails to achieve good standing by the end of two successive semesters on probation (excluding summer sessions).

1) *Requirements for Readmission after Discontinuation in Program.*

A student who has been suspended by the University must follow University guidelines for appeal. Readmission to the electrical engineering program after discontinuation or suspension is not automatic. An application for readmission must be made by the student and approved by the home institution's College and Department. Students who are readmitted after discontinuation by the Department, or suspension by the University, must meet requirements for continued enrollment appropriate to their individual situation. These requirements are specified in a "Continuation Agreement" that is mutually agreed upon and signed by the student and his/her appropriate advisor. The

consequences of failure to meet the requirements of the agreement may be articulated in the agreement itself. However, if these consequences are not included in the agreement, failure to meet the requirements will automatically result in the student's discontinuation from the electrical engineering program.

2. Documents to be submitted for admission (listing or sample).

Entrance Examinations. Freshman applicants must take the Scholastic Aptitude Test (SAT) or the American College Test (ACT). The achievement test in subject-matter fields is not required. For the SAT, application forms and information concerning the test fee, dates, and centers may be obtained from the College Board, P.O. Box 592, Princeton, New Jersey 08541. Information and application for the ACT may be obtained from The American College Test National Office, P.O. Box 168, Iowa City, Iowa 52243, and from high school guidance counselors. Applicants must request that their scores be sent to the Office of Admissions, Western Carolina University, Cullowhee, North Carolina 28723. College code for the SAT is 5897 and ACT code is 3172.

Secondary School Preparation. The quality and content of the applicant's high school program are important. A good background in English, mathematics, foreign language, social studies, and natural sciences is recommended. Students with inadequate preparation in English and mathematics, if admitted, will be required to complete additional work in these areas.

To be considered for any category of admission, students must have graduated from high school and successfully completed the following twelve units of college preparatory courses in high school:

4 units of English

2 units of algebra

1 unit of geometry or advanced math

3 units of science including

1 unit of a life or biological science

1 unit of a physical science

1 unit of an additional lab science

2 units of social studies including

1 unit in U.S. history

It is highly recommended that students complete at least two years of a foreign language in high school. Effective in the fall semester of 2004, two units of a

language other than English will be required. Also effective in the fall of 2004, one additional unit of mathematics beyond algebra II will be required.

(See http://www.wcu.edu/UnivCatalog/Catalog/admis/admissions.htm)

C. Degree requirements. List the following:

1. Total hours required. Major. Minor.

   The BSEE requires 127 semester hours.

2. Proportion of courses open only to graduate students to be required in program (graduate programs only).

   There is no program at the graduate level in EE at Western Carolina University.

3. Grades required.

   Freshman Year Requirements. All new freshman students are initially advised by a staff member in the Department of Engineering Technology. Students are eligible to transfer to the electrical engineering major upon 1) completion of all non-elective courses in their freshman year curriculum with grades of *C* or better, and 2) a minimum cumulative grade point average (GPA) of 2.00 for all courses taken.

   Sophomore through Senior Year Requirements. In addition to the University requirements for continued enrollment, students must maintain a major cumulative GPA of 2.00 for all courses taken within the electrical engineering program. Failure to meet this requirement for two consecutive semesters will result in suspension from the electrical engineering program.

   The following grading system will be used for all courses designated EE and ENGR:

Letter	**Interpretation**	**Quality Points per Semester Hour**
A	Excellent	4.0
B	Good	3.0
C	Satisfactory	2.0
D	Poor	1.0
F	Failure	0.0
I	Incomplete	--
IP	In Progress	--

S	Satisfactory	--
U	Unsatisfactory	--
W	Withdrawal	--
AU	Audit	--
NC	No Credit	--

The remaining courses in the EE program will follow the WCU grading system as stated in the college catalog.

4. Amount of transfer credit accepted.

Credit and Placement Policies

Evaluation of transfer, College Level Examination Program (CLEP), and advanced placement credits are coordinated through the Office of the Registrar. The university will accept or transfer appropriate undergraduate credits earned through credit by examination, advanced placement, CLEP, correspondence courses, extension courses, armed forces service schools, and college-level courses completed prior to graduation from high school. With the approval of the appropriate academic departments, the amount of such credit which may be applied toward a degree is subject to limitation only by the university's general residence requirement and the prescribed courses in the major field of study; the degree program may not exceed 45 semester hours of CLEP credit. Credit toward a degree is not awarded for Continuing Education Units or for General Education Development tests (GED).

Transfer of Credit. An evaluation of credits offered in transfer is completed after admission and after all official records are received directly from each institution previously attended. The applicability of transferred credits toward degree requirements is determined by the registrar's office and the department head of the student's major. In some cases, due to accreditation standards, validation of a course by successful completion of more advanced work in the same discipline or by examination may be required.

Only work passed with a grade of C (2.0) or better may be transferred. Courses with other grading systems that are equivalent to a C or better may be transferred. Except for consortium agreements, no credit will be allowed toward graduation or toward fulfillment of major requirements for a course passed with a C- or less at another institution. Credit will not be awarded for courses determined to be below the collegiate level nor from an institution not accredited by a nationally recognized regional accrediting agency. Undergraduate credit will not be awarded for graduate-level courses.

A Comprehensive Articulation Agreement (CAA) has been developed by the North Carolina Community College (NCCC) system and the University of North Carolina (UNC) General Administration providing for the transferability of a student's first two years of collegiate work to a senior UNC institution. This

agreement provides that a student who enrolls at a NCCC institution fall 1997 or later, and completes his/her home institution's 44 semester hours of general education requirements with a grade of C or better in each course, is guaranteed that those hours will be applied toward a baccalaureate degree at any UNC institution. These 44 hours must be used to satisfy the receiving institution's liberal studies requirements. In addition, the CAA also guarantees that upon completion of the Associate of Arts or Associate of Science degree, 20-21 hours of pre major work with a grade of C or better will be transferred and applied toward the student's baccalaureate degree at a UNC institution provided that the student remains within their major.

Credit may be transferred from a technical program of a two-year institution and applied toward an appropriate bachelor's degree if the institution is fully accredited or is a candidate for regional accreditation. A minimum of twenty-five percent of semester hours applied toward a bachelor's degree must be earned through regular enrollment in Western Carolina University junior-senior level courses, including a minimum of twelve hours in junior-senior courses in the major field.

In addition to those credits accepted as equivalents of the university's freshman and sophomore courses, a maximum of thirty hours of credit may be allowed toward graduation for freshman and sophomore courses completed at other institutions which are normally offered above the sophomore level at Western Carolina University.

There is no time limit on the course work accepted for undergraduate transfer credit. However, students who plan to schedule courses with stated prerequisites should consider auditing the prerequisite courses if no work has been attempted in the field within the past five years.

Regularly enrolled students who desire to take any course at another institution on a transient basis for transfer to WCU must secure the appropriate department head's and the registrar's approval before enrollment at the other institution. Transient Permission Forms are available in the registrar's office and the departments. Students must be in good standing and eligible to re-enroll at Western Carolina University to secure transient permission. Course work taken at an institution which has a consortium agreement with Western Carolina University will be given credit on the same basis as course work taken at WCU.

Grades made in transferred courses are not considered in computing the GPA at Western Carolina University, but transferred hours are added to earned hours and will affect the student's overall academic standing. A student may not expect to have the repeat course policy applied on the basis of courses completed at other institutions. Currently enrolled and former students (those not enrolled for one or more of the immediately preceding semesters, excluding summer terms) who attempt courses at other institutions must earn a cumulative 2.0 GPA and submit official transcripts of all work attempted to the Office of Admissions in order to be eligible to return to WCU.

Transfers must present a GPA of at least 2.50 and meet the same mathematics requirements as engineering freshmen using either high school or college mathematics courses. All transfers will be admitted to the lower division of the

electrical engineering program, and evaluation of transfer credits to the program will be performed by the Registrar and the Department Head. Transfers from an ABET accredited engineering program who do not have a 2.50 GPA may be admitted upon the recommendation of the Department Head.

5. Other requirements (e.g., residence, comprehensive exams, thesis, dissertation, clinical of field experience, "second major", etc.)

   General University Degree Requirements

   To be awarded a bachelor's degree, the student must meet the following general requirements:

   1. Completion of a minimum of 120 semester hours to a maximum of 128 semester hours under requirements outlined for one of the degree programs.
   2. A minimum GPA of 2.0 on all work attempted at Western Carolina University and on all courses in the major.
   3. A minimum of 25 percent of semester hours applied toward a bachelor's degree must be earned through regular enrollment in Western Carolina University junior-senior level courses, including a minimum of twelve hours in junior-senior courses in the major field.
   4. Fifty percent or more of the credits in the major presented for graduation on the junior-senior level unless the degree program being completed by the student is specifically exempted from the requirement.
   5. Be enrolled at Western the intended graduation semester. (Students who wish to pursue an exception to this rule must contact the Registrar's Office.

6. Language and/or research requirements.

   There are no language and/or research requirements.

7. Any time limits for completion.

   There is no time limit on the course work accepted for undergraduate transfer credit. However, students who plan to schedule courses with stated prerequisites should consider auditing the prerequisite courses if no work has been attempted in the field within the past five years.

D. List existing courses by title and number and indicate (*) those that are required. Include an explanation of numbering system. List (under a heading marked "new") and describe new courses proposed.

   The course numbering system is quite traditional. For example, a 1xx is a freshman course, a 2xx is a sophomore course, and so on. There is no particular significance to the last two digits.

   Liberal Studies component (42 semester hours) required.

   The major courses listed in the crosswalk below are required in the EE curriculum.

UNC Charlotte /WCU Electrical Engineering Curriculums
Course Crosswalk

	UNC Charlotte	**WCU**
ENGR 1201	Intro. to Engrng Practice/Principles I	ENGR 191
ENGR 1202	Intro. to Engrng Practice/Principles II	ENGR 192
ENGR 3295	Professional Development	ENGR 300
ECGR 2103	Computer Utilization in C++	EE 200
ECGR 2111	Network Theory I	EE 211
ECGR 2112	Network Theory II	EE 212
ECGR 2155	Logic and Networks Lab	EE 201
ECGR 2156	Instrumentation and Networks Lab	EE 202
ECGR 2181	System Design I	EE 221
ECGR 2252	Electrical Engineering Design I	EE 222
ECGR 3111	Signals and Systems	EE 311
ECGR 3121	Introduction to Electromagnetic Fields	EE 321
ECGR 3122	Electromagnetic Waves	EE 322
ECGR 3131	Fund of Electronics and Semiconductors	EE 331
ECGR 3132	Electronics	EE 332
ECGR 3133	Solid State Microelectronics I	EE 322
ECGR 3155	Systems and Electronics Lab	EE 301
ECGR 3156	E-M and Electronic Devices Lab	EE 302
ECGR 3157	Electrical Engineering Design II	EE 341
ECGR 3159	El. Eng. Professional Practice	EE 402
ECGR 3253	Senior Design I	EE 411
ECGR 3259	Senior Design II	EE 412
ECGR 4123	Communication Theory	EE 421
ECGR xxxx	Senior Elective	EE xxx
Technical Elective I		
Technical Elective II		
Technical Elective III		

The following courses are a listing of the required mathematics and sciences.

MATH 1zz	Engineering Calculus I*
MATH 2xx	Engineering Calculus II*
MATH 2yy	Engineering Calculus III*
MATH 320	Ordinary Differential Equations
MATH 370	Probability and Statistics
CHEM 132	Introductory Chemistry
PHY 230	General Physics
PHY 2xx	Fundamentals of Optics and Materials**
PHY 310	Modern Physics
Science Elective	

*Current calculus courses are four credits; three credit courses in Engineering Calculus will be developed to match courses at UNC Charlotte.

**New course. "Introductory course covering the fundamentals of geometrical optics and their interrelationship with material optical properties". 2 Lecture; 2 Laboratory.

IV. Faculty

A. List the names of persons now on the faculty who will be directly involved in the proposed program. Provide complete information on each faculty member's education, teaching experience, research experience, publications, and experience in directing student research, including the number of theses and dissertations directed for graduate programs. The official roster forms approved by SACS can be submitted rather than actual faculty vita.

Faculty from the Department of Electrical and Computer Engineering at UNC Charlotte and the credentialed Department of Engineering Technology will form a Joint Faculty for the Joint Program in Electrical Engineering. The Joint Faculty will include all qualified faculty members from each institution.(See Appendix A for vitas)

UNC Charlotte Faculty

David M. Binkley, Ph.D., P.E.
Stephen M. Bobio, Ph.D.
Robert J. Coleman, Ph.D.
Kasra Daneshvar, Ph.D.
M. A. Hasan, Ph.D.
Ivan Howitt, Ph.D.
J. Edward Jenkins, Jr., Ph.D.
Yogendra P. Kakad, Ph.D.
V. P. Lukic, Ph.D.
Mehdi Miri, Ph.D.
Arindam Mukherjee, (Ph.D. anticipated September 2003)
Asis Nasipuri, Ph.D.
D. Howard Phillips, Ph.D.
Edward B. Stokes, Ph.D.
Farid Michel Tranjan, Ph.D. (Department Head, Electrical & Computer Engineering)
Raphael Tsu, Ph.G. (Distinguished Professor)
Thomas Paul Weldon, Ph.D., P.E.
Lawrence R. Whicker, Ph.D.

WCU Faculty

Duane D. Dunlap, Ed.D. (Department Head, Engineering Technology)
Kenneth A. Burbank, Ph.D.
James Zhang, Ph.D.

Dr. Dunlap, Department Head for Engineering Technology, will assume the administrative duties for the EE program. Dr. Burbank, who is EAC/ABET qualified and currently program coordinator for Electrical and Computer Engineering Technology, will assume responsibilities as director of the EE program.

WCU will conduct nationwide searches to secure faculty who are EAC/ABET qualified to teach the on-site EE courses. A search committee formed from the joint faculty at the two institutions will oversee the search process and make a recommendation to the WCU program director. Input will be solicited during the search from the entire joint faculty at both institutions.

B. Estimate the need for new faculty for the proposed program over the first four years. If the teaching responsibilities for the proposed program will be absorbed in part or in whole by the present faculty, explain how this will be done without weakening existing programs.

WCU will require one additional EAC/ABET qualified faculty for fall 2004 to initiate the joint EE program. The primary duties for this individual will be instruction in the freshman engineering courses, and advising and recruiting.

As entering freshman enrollment increases, additional lecture and laboratory sections will increase. It is anticipated that three faculty will be necessary in the second year, five faculty in the third year, and seven faculty in the fourth year to maintain the ongoing program as specified in this proposal.

UNC Charlotte will require two additional faculty to offer the program after year two. There will also be a need for half-time program director beginning in the first year to coordinate the start-up of the joint degree program.

C. If the employment of new faculty requires additional funds, please explain the source of funding.

The source of funding for new faculty will come from "focus growth money", enrollment growth money and re-allocation of internal resources at WCU and UNC Charlotte.

D. Explain how the program will affect faculty activity, including course load, public service activity, and scholarly activity.

It is anticipated that faculty activity, course loads, public service will be typical of that in traditional engineering programs.

V. Library

A. Provide a statement as to the adequacy of present library holdings for the proposed program.

WCU's Hunter Library collections are not currently adequate to support this program. This is a new program in an area that the Library was not called upon in the past to build collections to support. There is a reasonable collection of science-related materials, but little specifically in Engineering. Monographs, media and journals are being purchased to support this program. In addition, the Library will need to license access to Engineering-related databases.

B. State how the library will be improved to meet new program requirements for the next five years. The explanation should discuss the need for books, periodicals, reference materials, primary source material, etc. What additional library support must be added to areas supporting the proposed program?

Hunter Library has been, and will continue to, purchase monograph and media collections to support this program. It is anticipated that the Library will need to invest $10,000 per year for the first year or two, and will then be able to scale back to between $5,000 - $7,000 per year.

The Library may also need to spend approximately $20,000 to license access to the IEEE databases and electronic journals. If needed, licenses for additional databases such as COMPENDEX will cost approximately $40,000 per year.

C. Discuss the use of other institutional libraries.

Hunter library provides free Interlibrary Loan services to all undergraduate and graduate students and to faculty. The average time required for a student or faculty to receive articles requested on Interlibrary Loan is about 3 days.

In addition, the Library provides free document delivery service from Ingenta for all undergraduate and graduate students and faculty This service costs the Library on average between $35-$50 per article. Ingenta provides access to articles from approximately 25,000 journal titles from a wide range of disciplines, including the sciences and Engineering. There are over 240 Computer Science journals and 60 Electrical and Nuclear Engineering journals (these two areas are grouped together) available via Ingenta. The student or faculty generally receives the article in less that 24 hours, either via email or via fax.

Students enrolled in the joint degree program will have access to the collections and services of both the Hunter Library at WCU and the Atkins Library at UNC Charlotte, subject to review of existing license agreements.

VI. Facilities and Equipment

A. Describe facilities available for the proposed program.

WCU's Department of Engineering Technology maintains 14 laboratories for instruction. Five of these laboratories are dedicated to electrical and telecommunications engineering technology. All are equipped with modern computers for simulation exercises and interfacing activities. Other laboratories are used for engineering computing graphics, rapid prototyping, manufacturing automation, machining, and metrology. A new building, the Center for Applied Technology, provides four additional laboratories with approximately 15,000 square feet and two additional classrooms. The laboratories associated with the Joint Degree program will be taught locally at WCU and UNC Charlotte.

<u>Existing Electrical Laboratories</u>

Analog Electronics
Digital Electronics
Digital Communications
Telecommunications and Networking
Electronics Fabrication

Laboratories under development

Optical Systems
Optoelectronics

Facilities currently exist for the study of modern analog and digital electronic systems, with a separate laboratory devoted to Digital Communications. Ongoing renovations to these laboratories include new test and measurement equipment that can be computer controlled. These laboratories support the current Electrical and Computer Engineering Technology and Telecommunications Engineering Technology programs, both of which involve the design, control, and test of electronic systems.

The DARPA grant is being used to establish additional facilities focused on optical system design and test. Two new laboratory spaces are being renovated and new equipment is being purchased to facilitate the student construction of optical communication systems as well as the testing of high speed optical transceivers.

A dedicated computer and instructional classroom will be created specifically for enhancing success in mathematics problem solving.

B. Describe the effect of this new program on existing facilities and indicate whether they will be adequate, both at the commencement of the program and during the next decade.

WCU's facilities are adequate for this program.

C. Discuss any information technology services needed and/or available.

WCU will remodel and develop an additional distance education facility in 104 Belk. UNC Charlotte will require equipment to outfit two classrooms in the Science and Technology Building for distance education delivery including computers, cameras, projectors, sound system, and associated equipment. Both institutions will require software licenses and additional full-time technical support personnel.

D. Discuss sources of financial support for any new facilities and equipment.

WCU has received an award ($4.7 million dollars) which is being administered by the Defense Advanced Research Projects Agency (DARPA). Approximately seventy percent of this award is being allocated to the acquisition of new equipment and infrastructure items to up-date existing electrical laboratory space and technology. New instrumentation and computers are being purchased that will improve testing capabilities and provide for the integration of computer-based testing and measurement.

VII. Administration

Describe how the proposed program will be administered, giving the responsibilities of each department, division, school, or college. Explain any inter-departmental or inter-unit administrative plans. Include an organizational chart showing the "location" of the proposed new program.

For purposes of program administration, the Dean of Engineering at UNC Charlotte and the Dean of the College of Applied Sciences at WCU or a designee of the Chief Academic Officer at each institution will be responsible for appointing a campus director for the joint program. The directors will be responsible for the program operation and accreditation. The constituent faculties involved with the joint program at WCU and UNC Charlotte will appoint a minimum of three faculty at their respective institutions to serve as Joint Faculty Curriculum Committee. The Joint Faculty of WCU and UNC Charlotte will have responsibility for determining curriculum, program objectives and outcomes, admission standards, assessment methodology, and standards for student progression and graduation. Admission standards to the program shall be determined by the Joint Faculty and implemented by an admissions committee at each campus.

The electrical engineering program at WCU will be located in the Department of Engineering Technology. The department name will be changed to the Department of Engineering and Technology upon approval of this proposal. The Department Head reports to the Dean of the College of Applied Sciences who reports to the Vice Chancellor of Academic Affairs for WCU.

VIII. Accreditation

Indicate the names of all accrediting agencies normally concerned with programs similar to the one proposed. Describe plans to request professional accreditation. If the proposed new degree program is at a more advanced level than those previously authorized or if it is in a new discipline division, was SACS notified of a potential "substantive change" during the planning process? If so, describe the response from SACS and the steps that have been taken to date with reference to the applicable procedure.

The appropriate accrediting body is the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology. The EE program at UNC Charlotte is ABET accredited and is now undergoing consideration for re-accreditation. Accreditation efforts will begin immediately so that an initial visit can be requested once the first class graduates. This accreditation cycle is usually six years. The accreditation will be the responsibility of the Joint Faculty of the program and will be under the supervision of the program directors.

SACS has been informally informed of this program initiative.

IX. Supporting Fields

Are other subject-matter fields at the proposing institution necessary or valuable in support of the proposed program? Is there needed improvement or expansion of these fields? To what extent will such improvement or expansion be necessary for the proposed program?

The subject matter fields of mathematics and sciences are particularly crucial to this program. These fields have adequate resources to support this degree program at WCU.

X. Additional Information

Include any additional information deemed pertinent to the review of this new degree program proposal.

A Memorandum of Understanding is under development.

XI. Budget

Provide estimates (using the attached form) of the additional costs required to implement the program and identify the proposed sources of the additional required funds. Use SCH projections (section II.C.) to estimate new state appropriations through enrollment increase funds. Prepare a budget schedule for each of the first three years of the program, indicating the account number and name for all additional amounts required. Identify EPA and SPA positions immediately below the account listing. New SPA positions should be listed at the first step in the salary range using the SPA classification rates currently in effect. Identify any larger or specialized equipment and any unusual supplies requirements.

For the purposes of the second and third year estimates, project faculty and SPA position rates and fringe benefits rates at first year levels. Include the continuation of previous years(s) costs in second and third year estimates.

Additional state-appropriated funds for new programs may be limited. Except in exceptional circumstance, institutions should request such funds for no more than three years (e.g., for start-up equipment, new faculty positions, etc.) at which time enrollment increase funds should be adequate to support the new program. Therefore it will be assumed that requests (in the "New Allocations" column of the following worksheet) are for one, two, or three years unless the institution indicates a continuing need and attaches a compelling justification. However, funds for new programs are more likely to be allocated for limited periods of time.

See attached budget sheets from WCU and UNC Charlotte.

XII. Evaluation Plans

All new degree program proposals must include an evaluation plan which includes: (a) the criteria to be used to evaluate the quality and effectiveness of the program, (b) measures to be used to evaluate the program, (c) expected levels of productivity of the proposed program for the first four years of operation (number of graduates), (d) the names, addresses, e-mail addresses, and telephone number of at least three persons (six reviewers are needed for graduate programs) qualified to review this proposal and to evaluate the program once operational, and (e) the plan and schedule to evaluate the proposed new degree program prior to the completion of its fifth year of operation once fully established.

Program Evaluation Format

A. Criteria to be used to evaluate the proposed program.

The basic program assessment procedures in place at UNC Charlotte for the BSEE program at that site will be adopted for the joint BSEE program. The joint BSEE program will meet EAC/ABET accreditation criteria.

B. Measures to be used to evaluate the program.

Success at obtaining accreditation by the EAC/ABET is the primary measure for evaluating the program. The approach to Freshman Engineering will be tailored after that at UNC Charlotte. Data regarding success in the joint engineering program will be compared to that of the traditional program at UNC Charlotte.

C. Projected productivity levels (number of graduates):

There will be no graduates during the first three years of the EE program. Freshman courses will begin Fall 2004, followed by sophomore courses, junior courses and senior courses on a yearly basis. Given an anticipated enrollment in Year 1 of 60 freshman and a four-year completion rate of 30%, it is anticipated that in Year 4 there will be 18 graduates. Following this same reasoning, with 80 freshman entering in Year 2, there will be 24 graduates in Year 5.

Level	Year 1	Year 2	Year 3	Year 4	Year 5	Total
B	0	0	0	18	24	42
M						
I/P						
D						

(Key: B-Bachelor's, M-Master's, I/P-Intermediate or Professional, D-Doctoral)

D. Recommended consultant/reviewers: Names, titles, addresses, e-mail addresses, and telephone numbers. May not be employees of the University of North Carolina.

Yi Zheng, Ph.D.
Professor and Chair
Department of Electrical and Computer Engineering
St. Cloud State University, St. Cloud, Minnesota 56301
Tel: 320-255-3926
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Dr. Dick Blandford, Chair
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Dr. Mesut Muslu, Professor & Chair
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University of Wisconsin-Platteville
Platteville, WI 53818
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Email: muslu@uwplatt.edu

E. Plan for evaluation prior to fifth operational year.

Since the joint electrical engineering program is patterned directly on the electrical engineering program at UNC Charlotte, ongoing evaluation will consist of yearly program assessment. Further, assessment will include end-of-year program evaluation by the joint faculty and department heads as well as feedback from students and identified stakeholders.

XIII. Reporting Requirements

Institutions will be expected to report on program productivity after one year and three years of operation. This information will be solicited as a part of the biennial long range planning revision.

Proposed date of initiation of proposed degree program: Fall 2004

This proposal to establish a new degree program has been reviewed and approved by the appropriate campus committees and authorities.

Chancellor: _____
The University of North Carolina at Charlotte

Chancellor: _____
Western Carolina University

SUMMARY OF ESTIMATED ADDITIONAL COSTS FOR PROPOSED PROGRAM/TRACK

Institution **UNC Charlotte** *Date* **December 22, 2003**

Program (API#, Name, Level) **14.1001 Electrical Engineering - Joint WCU-UNC Charlotte Program**

Degree(s) to be Granted **B.S.E.E.** *Program Year* **2004-2005**

	ADDITIONAL FUNDING REQUIRED - BY SOURCE				
	Reallocation of Present Institutional Resources	Enrollment Increase Funds	Federal/State or Other Non-state Funds (Identify)	New Allocations	Total
101 Regular Term Instruction					
* 1210 SPA Regular Salaries				$40,000	$40,000
Technical Staff - Half Time				40,000	
1110 EPA Non-teaching Salaries					0
* 1310 EPA Academic Salaries	0	0	0	199,000	199,000
Faculty Positions (2)				144,000	
Program Director				55,000	
1810 Social Security				18,284	18,284
1820 State Retirement				19,980	19,980
1830 Medical Insurance				8,799	8,799
2000 Supplies and Materials					0
2300 Educational Supplies					0
2600 Office Supplies					0
3000 Current Services	0			1,250	1,250
3100 Travel				1,000	
3200 Communications				250	
3400 Printing & Binding					
5000 Capital Outlay (Equipment)				170,400	170,400
5202 Software licenses				5,400	
Software (Centra)				30,000	
5300 Distance Education facilities				120,000	
Equipment Upgrades				15,000	
5200 EDP Equipment					
TOTAL Regular Term Instruction	**$0**	**$0**	**$0**	**$457,712**	**$457,712**
151 Libraries					
5000 Capital Outlay (Equipment)		0		10,000	10,000
5600 Library Book/Journal				10,000	
TOTAL Libraries	**$0**	**$0**	**$0**	**$10,000**	**$10,000**
189 General Institutional Support					
2000 Supplies and Materials				25,000	25,000
2600 Office Supplies				25,000	
3000 Current Services				60,000	60,000
3200 Communications				30,000	
3400 Printing & Binding				30,000	
5000 Capital Outlay (Equipment)				70,000	70,000
5100 Office Equipment				35,000	
5200 EDP Equipment				35,000	
TOTAL General Inst. Support	**$0**	**$0**	**$0**	**$155,000**	**$155,000**
TOTAL ADDITIONAL COSTS	**$0**	**$0**	**$0**	**$622,712**	**$622,712**

NOTE: Accounts may be added or deleted as required.

* Faculty positions and technical staff are for distance education and on-campus prograam development.

INSTITUTION Western Carolina University ***DATE October 10, 2003***

Program (API#, Name, Level) 14.1001 Electrical Engineering B.S.

Degree(s) to be Granted B.S. In Electrical Engineering ***Program Year 2004-05***

	Reallocation of Present Institutional Resources	Enrollment Increase Funds	Federal Other (Identify)	New Allocations	Total
101 Regular Term Instruction					
1210 SPA Regular Salaries					
Administrative assistant III		$25,000			$25,000
1310 EPA Academic Salaries					
Faculty position		$80,000			$80,000
Associate - advising/recruiting		$42,000			$42,000
1810 Social Security		$10,556			$10,556
1820 State Retirement		$15,769			$15,769
1830 Medical Insurance		$8,799			$8,799
2000 Supplies and Materials					
Student lab fee**				$12,000	$12,000
General supplies		$50,000			$50,000
3000 Current Services					
Travel		$2,000			$2,000
Travel - UNC Charlotte consultant		$3,000			$3,000
EAC evaluator/consultant		$6,000			$6,000
Recruitment & marketing		$10,000			$10,000
Postage		$1,200			$1,200
Telephone		$700			$700
ABET training for faculty		$1,500			$1,500
4000 Fixed Charges					
5000 Capital Outlay (Equipment)					
Office computer/furniture		$25,000			$25,000
Startup package		$50,000			$50,000
Equipment maintenance		$25,000			$25,000
Belk renovation (DARPA Grant)			$150,000	$150,000	$300,000
TOTAL - Regular Term Instruction	$0	$356,524	$150,000	$162,000	$668,524
151 Libraries					
Electronic access materials		$40,000			$40,000
Holdings	$10,000				$10,000
TOTAL - Libraries		$40,000			$50,000
TOTAL ADD'L COSTS…					
Graduate Assistantships		$36,000			$36,000
TOTAL	$0	$432,524	$150,000	$162,000	$754,524

** student lab fee pending approval by Trustees and BOG