

Annual  
Report

2001-

2002

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Electrical and Computer Engineering

## Department of Electrical and Computer Engineering

Interim Head: John R. Hauser

Associate Head: Jack Brickley

Graduate Programs Director: Winser Alexander

Undergraduate Advising Coordinator: Celilia Townsend

### Overview

The 2001-2002 academic year has been a difficult one for the ECE Dept. and a year of many changes in the department. For the second year in a row the department has been without a permanent department head with John Hauser serving this year as Interim Head. At the beginning of the year the department lost one faculty to another university and by the end of the year, four faculty members who had been with the department for most of their careers retired. The retiring faculty were: Ben O'Neal, Mike Littlejohn, Til Glisson, and Dick Kuehn. They will be greatly missed by our faculty and students.

The department had perhaps the largest teaching load at both the undergraduate and graduate levels in the history of the department, due to greatly increased numbers of both undergraduate and graduate students. The problems were especially severe at the graduate level where the ECE dept. had almost 200 more graduate students than the previous year. Almost all our graduate courses were subscribed at the maximum number of students and many students had difficulty getting into their desired courses. The budget reductions experienced by the COE and the Dept. during the year also contributed to the department's problems. Because of this and the oversubscription of Teaching Assistants, the department had to terminate many TA positions after two semesters of support in the Spring 2002 semester. This made it especially difficult for many of our graduate students to continue with their education and generated bad publicity for both our ECE dept. and the university. As a result of the over commitment of TAs, the dept. has made no new TA offers to foreign student for next year.

The Graduate Office was headed, on an interim basis, by Winser Alexander while we searched for a more permanent director. The position has been filled for the 2002-2003 academic year by Joel Trussell.

The department has been in the final phases of implementing a new undergraduate curriculum that allows our students more flexibility in selecting their junior and senior elective courses. In addition many of our undergraduate courses have been revised to reflect changes in ECE technology.

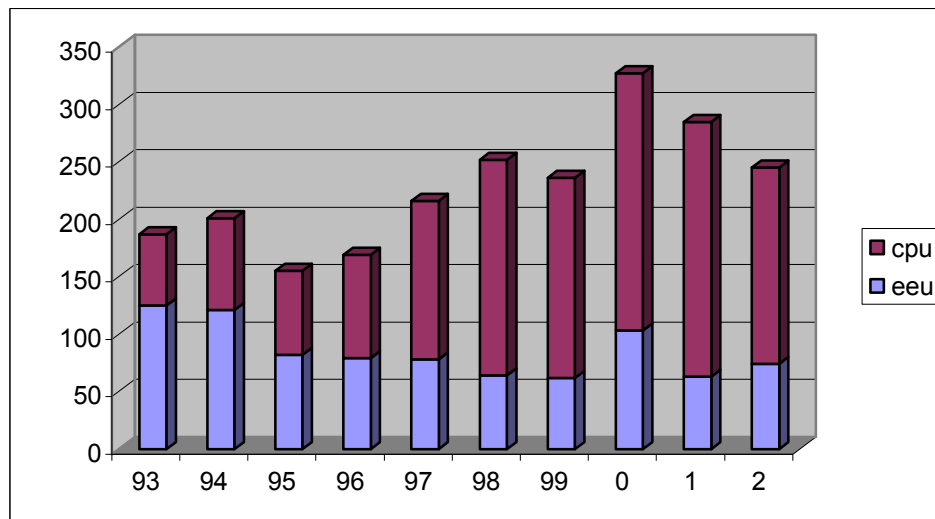
The department had a good year recruiting new faculty with five new faculty hires in the following areas: 1. Rhett Davis, Computer Architecture, 2. Yan Solihin, Computer Architecture, 3. Wenye Wang, Networking, 4. Doug Barlage, Nanoelectronics, and 5. Huaiyu Dai, Information Technology. These faculty compensate for the loss of faculty the past year due to retirements and resignations.

Research activities for the faculty held strong during the academic year with total research expenditures of about \$12,109,000. The ECE faculty continues to be the most productive faculty in the College of Engineering. Our Electrical Engineering Graduate program was ranked 19 nationally by the US News and World Report which is one of the highest rankings ever for the department. The faculty continued to publish extensively in technical journals and in conference proceedings their latest research results.

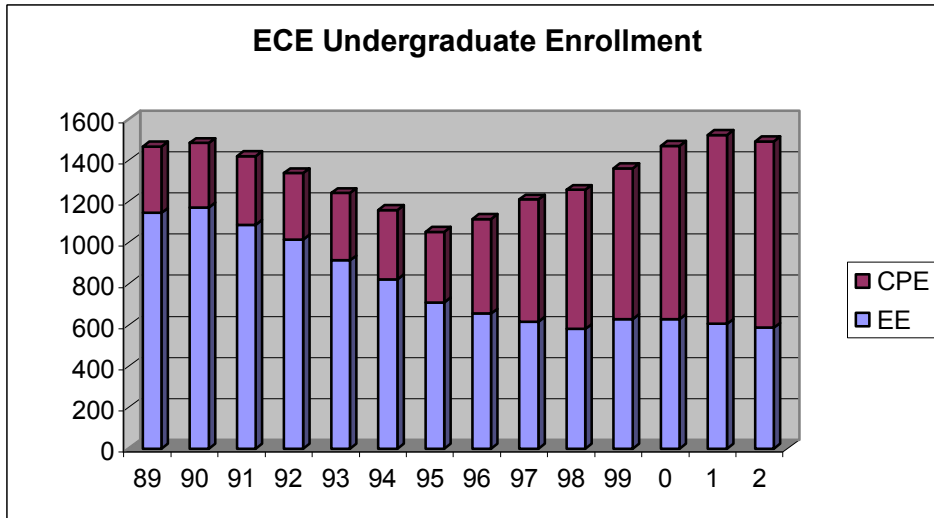
### Undergraduate Program

The ECE Department offers two accredited Bachelors of Science degrees, Electrical Engineering (EE) and Computer Engineering (CpE). In addition the department participates in the BS in Mechatronics degree program at UNC Asheville and a Biomedical Engineering program with BEA at NCSU. In addition the department offers a five year BS/MS degree program in ECE and a five year BS/Masters of Science Management degree. The undergraduate enrollment for 2001-2002 was 1522 students making it the largest department in the College of Engineering (as large as some colleges) and one of the largest in the US.

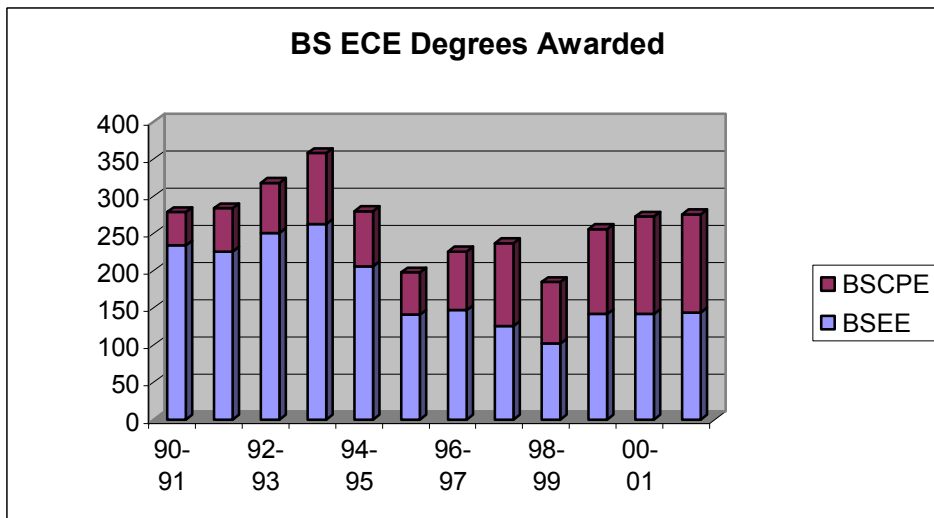
The makeup of students entering our department as freshmen is heavily favored toward computer engineering as the graph below shows for CPU and EEU students. However,



our general student population does not show this large an imbalance between electrical and computer engineering students. As seen below our overall population has stabilized somewhat at about 60% computer engineers and about 40% electrical engineers.



The undergraduate population in 2001-2002 exceeded slightly the previous peak occurring in 1990. The graduation rates for electrical and computer engineers are still closer to 50% each. The delivery of sufficient core level and senior level elective courses in Computer Engineering continues to be a challenge with the makeup of our faculty.



Shown below are statistics on our student's race and gender:

- Black 164
- White 1096
- Native American 12
- Asian 180
- Hispanic 25
- International 45
- Male 1364
- Female 158

Our enrollment of minority students continues to be much lower than desired and we will continue to try to improve our numbers of women and other minority groups.

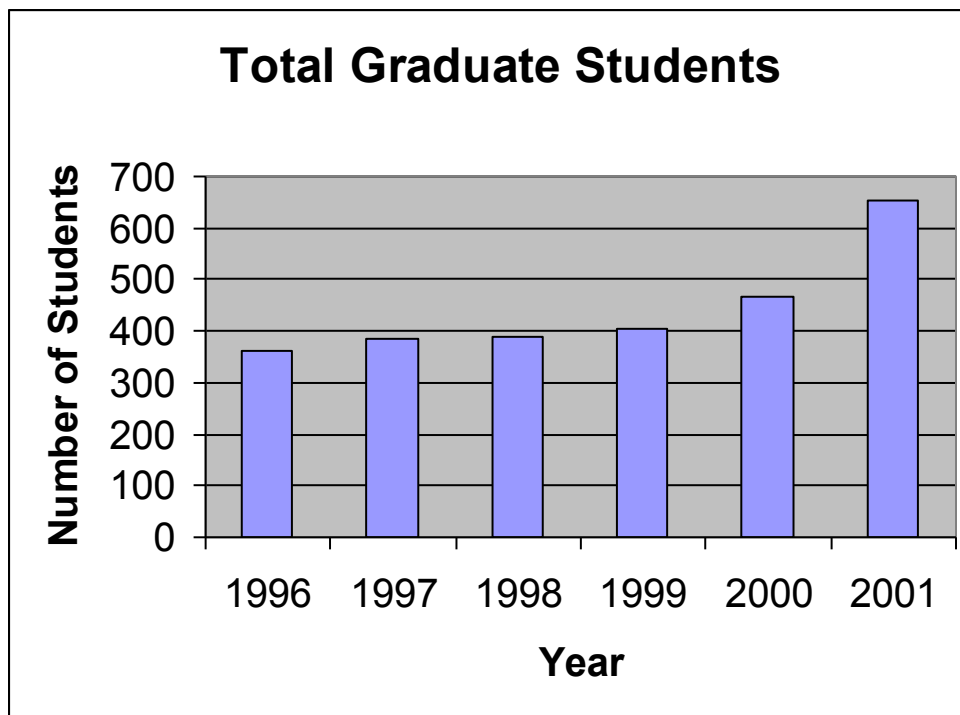
**Student organizations** include the Institute of Electrical and Electronic Engineers (IEEE), Society of Women Engineers (SWE), Alpha Omega Epsilon, Tau Beta Pi and Eta Kappa Nu (HKN).

**Undergraduate Scholarships:** One hundred ninety one scholarships were awarded to ECE undergraduates in 2001-2002. A listing of the scholarships and the recipients is contained in Appendix A.

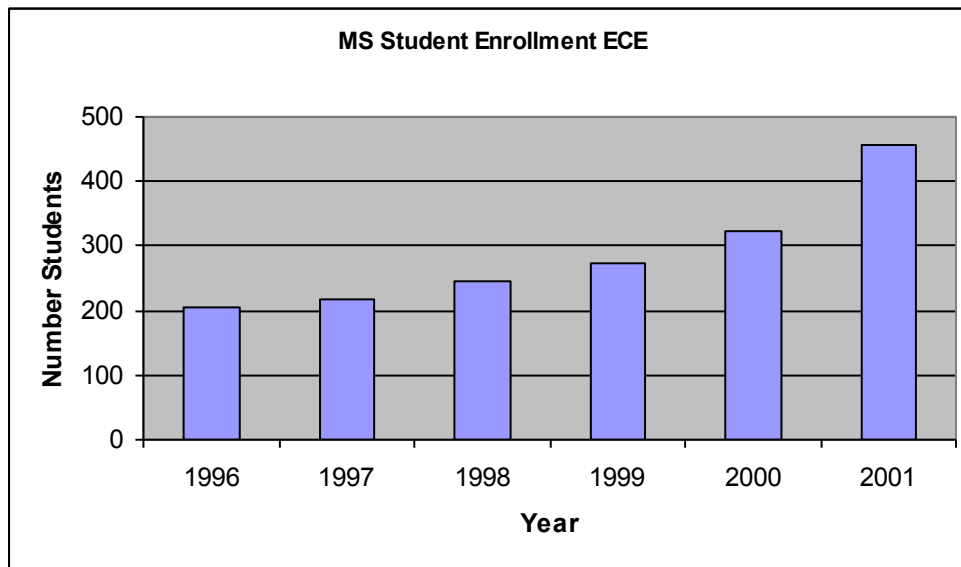
**Industrial Recruitment:** Of the students reporting industrial employment, the average starting salaries for our ECE graduates were \$50,584 and \$50,317 for Computer Engineers and Electrical Engineers respectively.

### Graduate Program

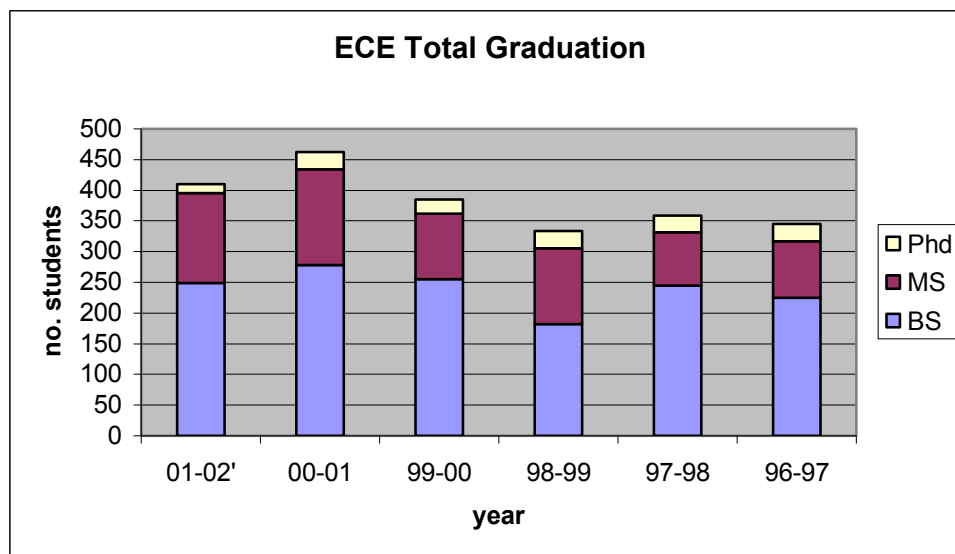
The ECE Department offers Masters of Science (with and without thesis) in Electrical Engineering, Computer Engineering and Networking and PhD degrees in Electrical or Computer Engineering. During the past year 655 graduate students were enrolled in our various programs. The number of graduate students has increased significantly over the past few years as indicated by the figure below.



The number of MS graduate students has also increased greatly in the last few years as shown in the figure below.



The total graduation rate for 2001-2002 was down slightly from the previous year as shown in the figure below. The number of PhD graduates was down slightly but this tends to fluctuate from year to year. The general trend with both undergraduates and graduates appears to be toward more graduates.



The graduate program experienced several problems this past year and a summary of these problems is given below.

1. The enrollment increased by 41% in fall 2001 as compared to fall 2000. This led to the following problems:

- a. Almost all of the ECE graduate courses were closed by the end of July. This meant that students who had not been able to pre-register had problems registering in the courses of choice. Dr. Jack Brickley was able to make adjustments for some of the courses to increase size. However, many of the ECE graduate students had to take courses outside their primary interest in fall 2001.
  - b. Many of the new students did not receive any financial support from NCSU. A large number of these students had the idea that they could find support once they were enrolled. This led to problems with many ECE students seeking support from faculty in ECE as well as other departments.
  - c. The ECE Department decided to limit admissions for spring 2002 to US citizens and permanent residents because of the over enrollment.
2. The ECE Department made too many teaching assistant (TA) offers for fall 2001.
    - a. This resulted in the appointment of 110 TAs for fall 2001. Dr. Brickley had projected a need for about 72 TAs to cover the fall semester courses.
    - b. The ECE Department had also made commitments for TAs to all of the students in the Accelerated Bachelors/Masters Program. There were about 20 of these students to receive a TA for spring 2002 so with projected graduations, this brought the number of TAs to about 128 to be supported for spring 2002.
    - c. After considering all options, the ECE Department decided to not reappoint students who had previously been a TA for 2 or more semesters by the end of fall 2001. This resulted in 34 students not being reappointed for spring 2001. The net result was 88 TA appointments for spring 2002.
    - d. The Vice Chancellor for Research and Graduate Programs found funds to appoint these students at the minimum level required to be supported by the Graduate Student Support Plan (GSSP). This amount was \$3,000 per semester for spring 2001. Approximately 20 ECE students were appointed as a part of this effort.
3. The ECE Department decided to limit the enrollment of new students to a total of 250 for fall 2002. Dr. Wesley Snyder took the leadership in screening the applications for admission. (See enrollment, applications and admissions information in Table)
4. The ECE Graduate Office has had staffing problems for some time.
    - a. Two administrative positions were approved toward the end of the 2000-2001 academic year. However, there were problems in finding the right person to fill the single Graduate Secretary position for several months prior the end of the 2000-2001 academic year.
    - b. Both of the positions were filled during May 2002 (Juliebeth Briseno and Stuart Purr).
    - c. There were many problems in payroll, graduation checkout and scheduling of exams during the fall and spring semesters. As a result, Stuart Purr, who was in the position of Graduate Secretary, resigned at the end of February, 2002. Three

unsuccessful efforts were made to fill his position before the position was frozen in June, 2002. This position is now available to be filled.

- d. H. J. Trussell accepted the Director of Graduate Programs for ECE effective 7/16/02.
5. We had about 35 students in ECE during fall semester 2001 who were not in compliance with the requirements for the Accelerated BS/MS Degree Program. Winser Alexander worked with the students to make appeals to the Graduate School for exceptions for such things as
    - a. Dual degree programs
    - b. Transfer from another university
    - c. More than one year for graduation after the BS (5 year rule).
    - d. Another BS degree prior to entering engineering.

This led to a review of the rules for the Program by the Graduate School. A committee was appointed by Dr. Sowell to review the issues and after the committee made its report, Dr. Sowell granted the appeals for about 30 of these students. Dick Kuehn helped some of the remaining students with their appeals. As a result, only about two of the student appeals were denied.

The rules for the BS/MS program were revised officially on 3/7/2002 by the Graduate School. The new rules are more reasonable. However, we are still having some problems with the credit hour requirements for some students who transferred from another university or have dual degree programs. I have been working on these problems.

6. There have been some problems with students being able to find faculty advisors. As a result, there are many students who are in violation of the one or two semester time limit for filing a plan of work. We will be working this year on changing the one semester limit, which seems unreasonable for new students, and getting better cooperation from faculty on advising new students.

Hopefully many of the problems effecting the graduate program have been resolved and we anticipate a much better 2002-2003 year.

### **Faculty Activities, Awards and Honors**

**Winser Alexander** served on the Advisory Board for the College of Engineering at North Carolina A&T State University.

**Mesut Baran** served as Assistant Editor of the IEEE Trans on Power Systems and as Chair, IEEE Power Engineering Society subcommittee on Distribution System Analysis Methods.

**Salah Bedair** and his students published 7 papers in technical journals and gave 13 presentations at technical conferences.

**Griff Bilbro** was selected an NCSU Outstanding Teacher for 2002.



**Greg Byrd** was on the program committee of the Fourth Intl. Conf on Massively Parallel Computing Systems and the Network Processors Conference.

**Mo-Yuen Chow** served as Associate Editor for the IEEE Trans on Industrial Electronics and will serve as the General chair of IECon'05 which will be held in Raleigh.

**Tom Conte** served as general Co-Chair of the IEEE/ACM International Symposium on Code Generation and Optimization and revised an existing course and created a new course on Compiler Optimization and Scheduling.

**Alex Dean** received an NSF Career award for Software Thread Integration for Low-End through High-End Embedded Processors.

**Mahil Devetsikiotis** was guest editor for Computer Networks Special Issue on Self-Similar Traffic Modeling and Engineering.

**Paul Franzon** was selected to the NCSU Academy of Outstanding Teachers, 2001 and was a member of DARPA ISAT advisory committee on Molecular Computing.

**Eddie Grant** was officially appointed as director of the Center for Robotics and Intelligent Machines.

**Ed Gehringer** gave eight presentations at education-oriented conferences on tools and methodologies for teaching.

**Alexander Duel-Hallen** was Guest Editor, IEEE Journal on Selected Areas in Communications special issue on Multiuser Detection Techniques with Application to Wired and Wireless Communications Systems.

**Brian Hughes** was on the program committee for two international conferences and Guest Editor for a special issue of IEEE Trans on Signal Processing.

**John Hauser** received the SIA University Research Award for contributions to the semiconductor industry.

**Ki-Wook Kim** and his students had 12 papers published in technical journals and gave 15 presentations at technical conferences.

**Bob Kolbas** spearheaded the development of a Photonics Materials laboratory in the EGRC.

**Hamid Krim** was an invited speaker at an NSF steering workshop on Pattern Recognition and served on the NSF Career review panel.

**Gianluca Lazzi** received an NSF CAREER award and a Whitaker Foundation Biomedical Engineering Grant (Young Investigator Award).

**Wentai Liu** was named Alcoa Professor of Electrical and Computer Engineering.

**Veena Misra** received an NSF Presidential Early Career Award for Scientists and Engineers.

**John Muth** developed a consolidated Photonics Laboratory in the EGRC working with Physics and Materials.

**Troy Nagle** was on leave as Medical/Scientific Advisor to the Director, National Institute of Biomedical Imaging and Bioengineering at NIH.

**Arne Nilsson** served as program director for our MS Computer Networking program.

**Carlton Osburn** was named director of the AEMP Center and was co-chair of the 2001 and 2003 Thermal and Thin Films Working Group for the International Technology Roadmap for Semiconductors.

**Mehmet Ozturk** developed and introduced a new introductory course for all our undergraduates, ECE 200.

**Eric Rotenberg** served on the program committee of the international Workshop on Interaction between Compilers and Computer Architectures.

**Mihail Sichitiu** developed a new course and laboratory for the MS Networking degree program.

**Wes Snyder** served as director of graduate admissions, spring 2002.

**Michael Steer** and his students published 7 papers in technical journals, had 17 conference publications and gave 16 invited talks on their research.

**Joel Trussell** published 4 technical papers and served as Associate Editor for IEEE Signal Processing Letters.

### Teaching Activities

The ECE faculty deliver courses by four techniques:

- Traditional classroom delivery
- Video Based Engineering Education (VBEE)
- National Technical University (NTU)
- Distance Learning via Internet

A detailed listing of courses can be found on the ECE Departmental WEB page and on the NC State WEB page. A summary of the ECE teaching loads relative to the College of Engineering (COE) is given below.

Enrollment per Faculty

|     | ECE   | COE Average |
|-----|-------|-------------|
| BS  | 25.43 | 15.07       |
| MS  | 11.45 | 4.75        |
| PhD | 4.98  | 2.55        |

Degrees per Faculty

|     | ECE  | COE Average |
|-----|------|-------------|
| BS  | 6.57 | 4.34        |
| MS  | 3.48 | 1.68        |
| PhD | 0.67 | 0.37        |

Research Expenditures per Faculty

|    | ECE     | COE Average |
|----|---------|-------------|
| \$ | 288,311 | 243,967     |

As the data shows the ECE productivity measures exceed the COE averages in all categories and probably exceed any other college in Engineering in students per faculty. The increased enrollment has reached the point where it is placing a heavy burden on the faculty's ability to continue to develop the graduate program and unless additional faculty positions come to the department, the number of students will have to be reduced.

### Personnel Changes

**Faculty Retirements:** Til Glisson, Dick Kuehn, Frank Kauffman and Ben O'Neal

**New Hires:** Doug Barlage (7/02), Rhett Davis (7/02), Yan Solihin (7/02), Wenye Wang (7/02) and Huaiyu Dai (1/03).

**Promotions/Tenure:** Tom Conte to Full Professor

**Staff:** One new Administrative Assistant position was created for the Analog Alliance Group and presently being filled.

### Research Programs

The department was reorganized in terms of research thrusts into six major areas:

- Analog RF and Mixed Mode (AMM)
- Computer Architecture (ARC)
- Information Technologies (IFT)
- Intelligent Systems and Bioengineering (ISB)
- Nanoelectronics and Photonics (NEP)
- Networking (NET)

In addition the department has 24 laboratories, centers/groups and research thrusts as listed on the departmental WEB page.

The total research expenditures for the ECE Department for last year were \$12,109,000 which is \$288,311 per faculty. The total amount of release time generated was \$369,710 which is an average of \$9,243 per faculty compared with a COE average of \$6,554. The departmental research expenditures has decreased over the past two years from a peak of \$14,704,000 in 1998-1999 while the release time has held fairly constant. The department needs to increase the level of research support. However, it is not clear that this can be accomplished with the presently existing heavy teaching load of the faculty.

### Financial Summary

Below is a financial summary of the ECE Departmental income and expenditures for the 2001-2002 year.

| <u>Income</u>                            |           |  | <u>Expenditures</u>                      |           |
|--|-----------|--|--|-----------|
| <b>I. Teaching and Research Salaries</b> |           |  | <b>I. Teaching and Research Salaries</b> |           |
| Professors                               | 1,658,677 |  | Professors                               | 1,658,677 |
| Associate Professors                     | 719,475   |  | Associate Professors                     | 719,475   |
| Assistant Professors                     | 591,606   |  | Assistant Professors                     | 591,606   |
| Lecturer                                 | 73,775    |  | Lecturer                                 | 73,775    |
| Leave of Absence                         | 346,666   |  | Leave of Absence                         | 158,338   |
| Phased Retirement                        | 116,352   |  | Phased Retirement                        | 126,063   |
| Vacant Positions                         | 537,662   |  |  |           |
| Computer Networking                      | 19,630    |  | Computer Networking                      | 147,125   |
| Reserves                                 | 7,167     |  |  |           |

|                                      |                         |
|--------------------------------------|-------------------------|
| Adjuncts Teaching                    | 0                       |
| RA Allocation                        | 70,000                  |
| TA Allocation                        | 202,308                 |
| TA's to Other Departments            | 0                       |
| Release Time                         | 343,885                 |
| <b>Total Teaching &amp; Research</b> | <b><u>4,687,203</u></b> |

**II. Administrative Salaries**

|                             |         |
|-----------------------------|---------|
| EPA Administrative Salaries | 171,138 |
| Admin. & Temporary Teaching | 0       |
| SPA Administrative Salaries | 586,833 |
| Temporary Salaries          | 84,324  |
| Summer Salaries             | 103,142 |

**Total Administrative Salaries** **945,437**

**III. Operating**

|                       |         |
|-----------------------|---------|
| Departmental Academic | 171,777 |
| Computer Networking   | 20,789  |
| Indirect Cost Return  | 127,286 |
| ETF Funds             | 269,650 |

**Total Operating** **589,502**

|                                 |         |
|---------------------------------|---------|
| Adjuncts Teaching               | 169,500 |
| RA's from New Hires             | 137,934 |
| Teaching Assistants (Fall 2001) | 600,569 |
| Teaching Assistants (Spr 2002)  | 377,080 |

**Total Teaching & Research** **4,760,142**

**II. Administrative Salaries**

|                             |         |
|-----------------------------|---------|
| EPA Administrative Salaries | 169,483 |
| Admin. & Temporary Teaching | 208,038 |
| Summer Salary               | 118,788 |
| SPA Administrative Salaries | 575,650 |
| Administrative Temps        | 0       |
| Temporary Salaries          | 71,995  |
|                             | 0       |
|                             | 0       |

**Total Administrative Salaries** **1,143,954**

**III. Operating**

|                       |         |
|-----------------------|---------|
| Departmental Academic | 174,067 |
| Computer Networking   | 20,789  |
| Indirect Cost Return  | 127,286 |
| ETF Funds             | 267,472 |

**Total Operating** **589,614**

## Appendix A. Undergraduate Scholarships

| Name of Award                               | Amount    | Student Recipient |    |           | Year and Major |     |
|---|-----------|-------------------|----|-----------|----------------|-----|
| William M. Cates                            | \$2,500   | Jonathan          | A. | Abell     | SR             | CPE |
| Amelia N. Mitta Memorial                    | \$1,500   | Benjamin          | L. | Anderson  | JR             | CPE |
| Park Cohort 2000                            | Full Ride | Erick             |    | Andrew    | SO             | CPE |
| Guilford Mills                              | \$6,358   | Hapinder          | S. | Atwal     | JR             | CPE |
| Guilford Mills/Izzy Zank                    | \$3,179   | Jagreet           | S. | Atwal     | SR             | CPE |
| William M. Cates                            | \$2,500   | Bradley           | R. | Aycock    | JR             | CPE |
| Richard Greenwood Thomas                    | \$1,000   | Jeffrey           | S. | Backus    | SR             | EE  |
| William M. Cates                            | \$2,500   | Mohammet          | M. | Baianonie | SR             | CPE |
| William M. Cates                            | \$1,250   | Christopher       | D. | Bailey    | SR             | EE  |
| NACME-Nat'l. Action Council for Minorities  | \$1,500   | Randy             | K. | Baker     | JR             | EE  |
| Elizabeth P. Cockrell                       | \$7,500   | Arahti            | S. | Bale      | SR             | EE  |
| Nortel Networks                             | \$3,000   | William           | B. | Ball      | JR             | CPE |
| Clarence M. Smith, Jr.                      | \$2,000   | James             | M. | Banks     | FR             | CPU |
| Nortel Networks                             | \$3,000   | Paul              | H. | Barbee    | SO             | EE  |
| Nortel Networks                             | \$1,500   | Leslie            | T. | Barfield  | JR             | EE  |
| Lockheed Martin Aeronautical Engineering    | \$2,500   | Jacob             | L. | Barlow    | JR             | CPE |
| Science Olympiad Gold Medal                 | \$1,000   | James             | T. | Barrett   | FR             | EEU |
| Dean's Merit                                | \$2,500   | Michael           | A. | Barton    | JR             | EE  |
| GTE Foundations                             | \$2,500   | Thomas            | A. | Basnight  | SO             | CPE |
| William M. Cates                            | \$2,500   | David             | J. | Benedict  | JR             | EE  |
| Deans Merit - Non Renewable                 | \$2,000   | William           | L. | Boddie    | FR             | CPU |
| Nortel Networks                             | 1,,500    | Christopher       |    | Boskken   | SR             | CPE |
| Carolina Electronics Representatives Assoc. | \$1,000   | Geoffrey          | K. | Bradshaw  | JR             | EE  |
| Nortel Networks                             | \$3,000   | Gregory           | B. | Brown     | JR             | CPE |
| William M. Cates                            | \$2,500   | Gregory           | B. | Brown     | JR             | CPE |
| NCAMP                                       |           | Billyde           |    | Brown     | SO             | EE  |
| William E. and Carol L.Highfill             | \$1,000   | Aaron             | S. | Brown     | SR             | EE  |
| William M. Cates                            | \$2,500   | Dalat             | N. | Bui       | SR             | CPE |
| Nortel Networks                             | \$3,000   | Thomas            | C. | Caldwell  | SR             | CPE |
| Herbert B. Walker                           | \$6,800   | Thomas            | C. | Caldwell  | SR             | EE  |
| Sprint                                      | \$500     | Philip            | S. | Calouche  | JR             | CPE |
| Park Cohort 2001                            | Full Ride | Robert            | C. | Campbell  | SO             | EEU |
| Harry C. Rudd, Jr.                          | \$1,250   | Jonathan          | B. | Cantor    | SR             | EE  |
| NSF Computer Science, Engineering, Math     | \$2,500   | Jonathan          | B. | Cantor    | SR             | EE  |
| Robert G. Carson, Jr.                       | \$2,200   | Jonathan          | B. | Cantor    | SR             | EE  |
| BP Amoco                                    | \$1,250   | Johnny            |    | Carelock  | SO             | CPE |
| GTE Foundations                             | \$1,250   | Stuart            | E. | Carney    | SR             | CPE |

|  |           |            |    |               |    |     |
|--|-----------|------------|----|---------------|----|-----|
| Ben Franklin/R.J. Reynolds               | \$1,000   | Megan      |    | Carpenter     | SR | CPE |
| Dean's Merit                             | \$2,500   | Megan      | B. | Carpenter     | SR | CPE |
| Park Cohort 1998                         | Full Ride | Joseph     | D. | Christie      | SR | CPE |
| NCAMP                                    | \$1,500   | Patrick    | K. | Clemons       | SR | EE  |
| William M. Cates                         | \$1,250   | Kristopher | M. | Clinard       | SR | CPE |
| Clarence M. Smith, Jr.                   | \$2,000   | Phillip    | M. | Coltrane      | SO | CPE |
| Llewellyn Hewett, Jr.                    | \$1,000   | William    | P. | Cornwell      | SR | EE  |
| William D. Stevenson, Jr.                | \$2,000   | Chadwick   | D. | Craver        | JR | EE  |
| Nortel Networks                          | \$3,000   | Benjamin   | P. | Creech        | SR | CPE |
| Philip B. Jackson                        | \$2,500   | Donovan    | P. | Dacons        | SO | CPE |
| Clarence M. Smith, Jr.                   | \$2,000   | Donovan    | P. | Dacons        | SO | CPU |
| Alumni Loyalty Transfers                 | \$2,000   | Byron      | K. | Datus         | JR | EE  |
| Alumni Loyalty                           | \$2,000   | Edward     | M. | Dawley        | SO | CPE |
| Frank T. Pankotay Memorial               | \$1,500   | Robert     | A. | Dawley        | SR | EE  |
| William deRosset Scott III Memorial      | \$1,500   | Matthew    | B. | Deese         | SR | CPE |
| William M. Cates                         | \$2,500   | Adam       | B. | Dickerson     | JR | EE  |
| William M. Cates                         | \$1,250   | Lydia      | M. | Do            | JR | CPE |
| John R. and Ann C. Hauser                | \$1,500   | Rachael    | S. | Dong          | JR | CPE |
| William D. Stevenson, Jr.                | \$2,000   | Varinthira |    | Duangudom     | SR | EE  |
| William M. Cates                         | \$1,250   | Michael    | P. | Eads          | SR | EE  |
| Dean's Merit                             | \$2,500   | Franklin   | B. | Edmiston      | JR | CPE |
| Nortel Networks                          | \$3,000   | Daniel     | J. | Elliott       | SO | EEU |
| William E. and Carol L.Highfill          | \$2,000   | Shawn      | D. | Evans         | SR | EE  |
| William M. Cates                         | \$2,500   | Michael    | E. | Everett       | JR | CPE |
| Park Cohort 1999                         | Full Ride | Brian      | D. | Ferris        | SR | CPE |
| GTE Foundations                          | \$2,500   | David      | N. | Forgeng       | SO | EE  |
| Clarence M. Smith, Jr.                   | \$2,000   | David      | A. | Fredenbug     | FR | CPU |
| William M. Cates                         | \$2,500   | Boycutt    | F. | Frederick     | JR | CPE |
| Katharine Stinson                        | \$2,500   | Andrea     |    | Fryinger      | SR | EE  |
| General Electric Foundation Minority Sch |           | Ronald     | C. | Funderburk II | SO | CPE |
| GTE Foundations                          | \$2,500   | Sarah      | J. | Goodman       | SR | CPE |
| NSF Computer Science, Engineering, Math  | \$2,500   | Sarah      | J. | Goodman       | SR | CPE |
| Clarence M. Smith, Jr.                   | \$2,000   | Corey      | R. | Goolsby       | JR | EE  |
| Dean's Merit                             | \$2,500   | Marc       | G. | Gray          | FR | CPU |
| Nortel Networks                          | \$3,000   | Stephanie  | J. | Hackerd       | FR | EEU |
| Alumni Loyalty Transfers                 | \$2,000   | William    | K. | Haskins       | SR | EE  |
| William E. Clark                         | \$1,250   | James      | M. | Hildebrand    | SR | CPE |
| Ben Franklin/UTC                         | \$1,500   | C.         | K. | Hill          | SR | EE  |
| Dean's Merit                             | \$2,500   | Charles    | K. | Hill          | SR | EE  |
| Nortel Networks                          | \$3,000   | Charles    | K. | Hill          | SR | EE  |
| Park Cohort 1999                         | Full Ride | Daniel     | T. | Hoag          | SR | CPE |

|  |           |             |    |             |    |     |
|--|-----------|-------------|----|-------------|----|-----|
| BP Amoco                                 | \$1,250   | Jaime       |    | Holliday    | SO | EE  |
| GTE Foundations                          | \$2,500   | Doumit      | S. | Ishak       | SO | CPE |
| L. A. Mahler                             | \$700     | Jason       | P. | Jarosz      | SR | CPE |
| North Carolina Electric Membership Corp  | \$2,000   | Kevin       | M. | Jefferies   | SR | EE  |
| Assistant Dean's Discretionary Fund      | \$750     | Michael     | A. | Johnson     | SR | CPE |
| BP Amoco                                 | \$1,250   | Michael     | A. | Johnson     | SR | CPE |
| Dean's Merit                             | \$1,000   | Walter      | C. | Johnson     | SR | CPE |
| William M. Cates                         | \$2,500   | Edgar       | A. | Johnson     | SR | EE  |
| Alumni Loyalty                           | \$2,000   | William     | M. | Jones       | SO | EE  |
| Charles S. Mitchell Memorial             | \$2,600   | Derek       | H. | Justice     | SR | EE  |
| Alumni Loyalty                           | \$2,000   | Melissa     | A. | Kean        | JR | EE  |
| Nortel Networks                          | \$3,000   | Melissa     | A. | Kean        | JR | EE  |
| Park Cohort 1999                         | Full Ride | Christopher | P. | Kearney     | JR | CPE |
| Nortel Networks                          | \$3,000   | Robert      | N. | Keene       | FR | CPU |
| Alumni Loyalty Transfers                 | \$1,000   | Karen       | D. | Kennedy     | SR | CPE |
| ABB Brain Power                          | \$2,500   | Tracy       |    | Kennedy     | JR | EE  |
| William M. Cates                         | \$2,500   | Tracy       |    | Kennedy     | JR | EE  |
| Science Olympiad Gold Medal              | \$1,000   | Ibraheem    | H. | Khalifa     | FR | CPU |
| Nortel Networks                          | \$3,000   | William     | F. | Kidney      | SO | CPE |
| Sprint                                   | \$1,500   | Sae         | K. | Kim         | SR | EE  |
| Dean's Merit                             | \$1,000   | Robyn       | C. | Kinney      | SR | EE  |
| Alumni Loyalty                           | \$2,000   | Jesse       | B. | Kirby       | JR | EE  |
| BP Amoco                                 | \$2,500   | Vance       | L. | Koonce, Jr. | FR | EEU |
| Park Cohort 1998                         | Full Ride | Milind      | V. | Kulkarni    | SR | CPE |
| Dean's Merit                             | \$2,500   | Brandan     | C. | Lennox      | SO | CPU |
| Fujitsu                                  | \$1,250   | Wai         |    | Leung       | JR | EE  |
| Dean's Merit                             | \$1,250   | Jonathan    | V. | Lewis       | JR | EE  |
| Clarence M. Smith, Jr.                   | \$2,000   | James       | W. | Lin         | SO | CPU |
| William M. Cates                         | \$2,500   | Joseph      | A. | Lion        | SR | EE  |
| Fujitsu                                  | \$12,550  | Frederick   | J. | Livingston  | SR | CPE |
| Ben Franklin/Drexel "Rex" K. Smith, Jr.  | \$1,500   | Jonathan    |    | Lupton      | SR | CPE |
| Dean's Merit                             | \$2,000   | Jonathan    | K. | Lupton      | SR | CPE |
| Nortel Networks                          | \$3,000   | Jonathan    | K. | Lupton      | SR | CPE |
| Lockheed Martin Aeronautical Engineering | \$1,250   | Lola        | T. | Mafe        | SO | CPE |
| William M. Cates                         | \$2,500   | Jeremy      | M. | Magee       | JR | CPE |
| Dean's Merit                             | \$2,500   | Quinn       | P. | McCleery    | JR | EE  |
| Nortel Networks                          | \$1,500   | Steven      | W. | McConnell   | SR | CPE |
| NCAMP                                    | \$3,000   | Timothy     |    | McDermott   | SO | EEU |
| Park Cohort 1999                         | Full Ride | Stephanie   | E. | Menser      | SR | EE  |
| Dean's Merit                             | \$2,000   | Matthew     | L. | Miller      | SR | EE  |
| E. Chester Seewald                       | \$1,500   | Jonathan    | W. | Miller      | JR | EE  |

|                                      |           |             |      |                  |    |     |
|--------------------------------------|-----------|-------------|------|------------------|----|-----|
| E. Chester Seewald                   | \$750     | Andrew      | S.   | Morgan           | JR | EE  |
| Deans Merit - Non Renewable          | \$2,000   | Michael     | P.   | Morgenson        | FR | CPU |
| Dean's Merit                         | \$1,250   | Aaron       | H.   | Morris           | SR | CPE |
| William E. and Carol L.Highfill      | \$2,000   | Adam        | D.   | Needle           | SR | EE  |
| Eugene C. and Winifred Sakshaug      | \$1,800   | Jason       | S.   | Nelson           | SR | CPE |
| Alumni Loyalty Transfers-2001 Cohort | \$2,000   | Jason       | D.   | Nix              | SO | EE  |
| William M. Cates                     | \$2,500   | Bo          | T.   | Norman           | SR | EE  |
| E. Chester Seewald                   | \$1,500   | Mehmet      | E.   | Ozbilge          | JR | EE  |
| State Employees Combined Campaign    | \$1,500   | Viju        |      | Padmanabhan      | JR | CPE |
| Ben Franklin/Petty                   | \$1,500   | Chethan     |      | Pandarinath      | SR | CPE |
| Philip B. Jackson                    | \$1,260   | Chethan     |      | Pandarinath      | SR | CPE |
| Josephus Daniels                     | \$2,000   | Hitesh      | B.   | Patel            | SR | CPE |
| Nortel Networks                      | \$3,000   | Devarshi    | S.   | Patel            | SR | CPE |
| William M. Cates                     | \$2,500   | Hitesh      | B.   | Patel            | SR | CPE |
| William M. Cates                     | \$2,500   | Priti       | R.   | Patel            | JR | CPE |
| Deans Merit - Non Renewable          | \$2,000   | Mital       | M.   | Patel            | FR | CPU |
| William M. Cates                     | \$2,500   | Zacchaeus   | A.   | Pearsall         | JR | CPE |
| Park Cohort 2001                     | Full Ride | Daniel      | L.   | Pickett          | FR | CPU |
| Llewellyn Hewett, Jr.                | \$2,000   | Wallace     | S.   | Pitts            | JR | CPE |
| William M. Cates                     | \$2,500   | Charlee     |      | Poineau          | JR | EE  |
| William M. Cates                     | \$2,500   | Sherman     | J.   | Pope             | JR | EE  |
| Ben Franklin/Duke                    | \$1,500   | Michael     |      | Pratt            | SR | CPE |
| Ben Franklin/Petty                   | \$1,000   | Richard     |      | Prince           | SR | EE  |
| David W. and Anne B. Pearsall        | \$2,000   | Richard     | L.   | Prince           | SR | EE  |
| William Jackson Goodrum              | \$2,000   | Joseph      | K.   | Pruitt           | SR | CPE |
| William M. Cates                     | \$2,500   | James       | A.   | Roberts          | JR | EE  |
| William M. Cates                     | \$2,500   | Brently     | W.   | Robinson         | JR | CPE |
| Nortel Networks                      | \$3,000   | Payam       |      | Rohani-Vadeghani | SR | CPE |
| William M. Cates                     | \$1,250   | Payam       |      | Rohani-Vadeghani | SR | CPE |
| L. A. Mahler                         | \$1,500   | Alberto     | J.   | Rojas            | SR | EE  |
| William M. Cates                     | \$1,250   | William     | S.   | Rooks            | SR | EE  |
| Park Cohort 1998                     | Full Ride | Brent       | R.   | Rowe             | SR | EE  |
| Ben Franklin/Petty                   | \$1,000   | Kevin       |      | Runyan           | JR | CPE |
| Park Cohort 1998                     | Full Ride | Shantel     | L.   | Samuel           | SR | CPE |
| Llewellyn Hewett, Jr.                | \$2,000   | Christopher | S.   | Saunders         | SR | CPE |
| GTE Foundations                      | \$2,500   | Matthew     | R.   | Sawyer           | SO | EE  |
| Nortel Networks                      | \$3,000   | Matthew     | P.   | Schmidt          | SO | CPE |
| Powers Manufacturing                 | \$4,300   | Kacey       | L.   | Schmidt          | SR | EE  |
| William M. Cates                     | \$1,250   | Kacey       | Lynn | Schmidt          | SR | EE  |



|   |           |         |    |            |    |     |
|---|-----------|---------|----|------------|----|-----|
| Lockheed Martin Aeronautical Engineering          | \$1,250   | Anup    | M. | Shah       | JR | EE  |
| Dean's Merit                                      | \$2,000   | Matthew | R. | Sharpe     | SR | EE  |
| NSF Computer Science, Engineering and Mathematics | \$1,250   | Erik    | A. | Shold      | SR | CPE |
| NCAMP   | \$1,500   | Donell  |    | Singletary | SO | CPU |
| Clarence M. Smith, Jr.                            | \$2,000   | Rebecca | L. | Slager     | SR | EE  |
| Nortel Networks                                   | \$3,000   | Mark    | J. | Smiley     | SO | EE  |
| Alumni Loyalty                                    | \$2,000   | Matthew | T. | Smith      | JR | CPE |
| NSF Computer Science, Engineering and Mathematics | \$2,500   | Wendell | B. | Smith      | SR | CPE |
| Lockheed Martin Aeronautical Engineering          | \$2,500   | Shruthi |    | Soora      | SO | CPE |
| Nortel Networks                                   | \$3,000   | James   | V. | Stancil    | SO | EE  |
| Lockheed Martin Aeronautical Engineering          | \$1,250   | Ryan    | J. | Staton     | SO | EE  |
| Science Olympiad Gold Medal                       | \$1,000   | Peter   | B. | Stewart    | FR | CPU |
| Ben Franklin/J. Minor Davis                       | \$1,000   | Kristen |    | Stout      | JR | CPE |
| Clarence M. Smith, Jr.                            | \$2,000   | Adam    | S. | Swecker    | SR | CPE |
| Eugene C. and Winifred Sakshaug                   |           | Kevin   | D. | Taff       | JR | EE  |
| Oliver G. Haywood                                 | \$1,850   | Brian   | M. | Taff       | SR | EE  |
| Dean's Merit                                      | \$2,500   | Eric    | J. | Taylor     | FR | CPU |
| William M. Cates                                  | \$2,500   | Cheng   | Y. | Tsai       | JR | EE  |
| Pratt Family                                      | \$750     | David   | B. | Turlington | SR | EE  |
| Nortel Networks                                   | \$3,000   | Gladis  |    | Valenzuela | FR | CPU |
| NSF Computer Science, Engineering, Math           | \$2,500   | Valerie | A. | Virtudazo  | JR | CPE |
| William M. Cates                                  | \$2,500   | Valerie | A. | Virtudazo  | JR | CPE |
| Deans Merit - Non Renewable                       | \$2,000   | Thomas  | M. | Wadsworth  | FR | CPU |
| Lockheed Martin Aeronautical Engineering          | \$1,250   | Manveer | S. | Wasson     | SO | EE  |
| Simon Brown Woolard                               | \$1,000   | Adam    | P. | Welch      | JR | EE  |
| David W. and Anne B. Pearsall                     | \$2,000   | Joseph  | B. | West       | SR | CPE |
| Park Cohort 1999                                  | Full Ride | Wilson  | L. | White      | JR | CPE |
| William D. Stevenson, Jr.                         | \$2,000   | Joshua  | M. | White      | JR | EE  |
| North Carolina Electric Membership Corp           | \$2,000   | Donald  |    | Widdows    | SR | EE  |
| Lockheed Martin Aeronautical Engineering          | \$1,250   | Matthew | T. | Wilda      | SR | CPE |
| William D. Stevenson, Jr.                         | \$1,000   | Matthew | T. | Wilda      | SR | CPE |
| James Lee and Jean L. Davis                       | \$10,500  | Leslie  | L. | Williams   | SO | CPE |
| United Technologies Research Center (UTC)         | \$2,000   | Bradley | E. | Williamson | JR | CPE |
| Clarence M. Smith, Jr.                            | \$2,000   | Brian   | R. | Wood       | SO | CPE |