

# Clemson University Libraries

## Electrical and Computer Engineering Information Access Policy

Engineering Librarian:  
Jan Comfort

Written by J. Comfort 5/10  
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### Introduction

This Information Access Policy is a statement of goals for building the library's collection in the subject area of Electrical and Computer Engineering. It should serve as a guide for library personnel in making collection development decisions, and should inform users, in general, how library materials are selected.

**Electrical engineering** is a field of engineering that generally deals with the study and application of electricity electronics and electromagnetism. The field first became an identifiable occupation in the late nineteenth century after commercialization of the electric telegraph and electrical power supply. It now covers a range of subtopics including power, electronics, control systems, signal processing and telecommunications.

**Computer Engineering (also called Electrical and Computer Engineering)** is a discipline that combines both electrical engineering and computer science. Computer engineers usually have training in electronic engineering, software design and hardware-software integration instead of only software engineering or electronic engineering. Computer engineers are involved in many aspects of computing, from the design of individual microprocessors, personal computers, and supercomputers to circuit design. This field of engineering not only focuses on how computer systems themselves work, but also how they integrate into the larger picture. (from Wikipedia)

**The Holcombe Department of Electrical and Computer Engineering** can trace its roots back to the beginnings of Clemson University, as more than half of the first graduating class received degrees in mechanical-electrical engineering in 1896. One of the oldest engineering departments at Clemson University, the department was formed in 1933, adding a graduate degree program in electrical engineering in 1948, and awarding its first doctoral degree in 1967.

The department is now one of the largest and most active at Clemson, with over 50 faculty members who teach and perform research in a broad range of topics in Electrical Engineering and Computer Engineering. Many members of our faculty are known nationally and internationally, and among the ranks are several IEEE Fellows, two endowed chairs, and seven named professorships. In addition, several young faculty members have recently won prestigious national and international awards and grants. Many alumni have reached the highest levels of professional achievement. The current student body numbers approximately 540 undergraduates and 180 graduate students, of whom 100 are Ph.D. candidates. The department offers a rich curriculum which comprises more than 60 undergraduate courses and 80 graduate courses. The ratio of students to faculty is low, and the faculty are proud of the Clemson tradition of close interaction among faculty and students.

Our faculty and graduate students are involved in diverse and challenging research projects, and the department has been the recipient of a number of grant awards from highly prestigious and selective national research programs. Our research activities are conducted in fully equipped laboratories, many of which are housed in the state-of-the-art Fluor Daniel Engineering Innovation Building. Current research encompasses a wide spectrum of activities in the general areas of communications, electronics, computer architecture, and intelligent systems. (from the ECE website 2/2017)

## Purpose of the Collection

The ECE Collection supports the teaching, research, and information needs at the undergraduate and graduate level in Electrical and Computer Engineering.

### Primary Users:

- Undergraduates pursuing the BS degree in Electrical Engineering or Computer Engineering
- Students pursuing the combined BS/MS degree in Electrical Engineering or Computer Engineering
- Graduate students pursuing the MEng, MS, or PhD degree in Electrical Engineering
- Graduate students pursuing the MS or PhD degree in Computer Engineering or Photonics
- Graduate students pursuing the Advanced Power Systems Engineering Certificate, the Engineering Education Certificate, or the Technology Entrepreneurship Certificate
- ECE faculty ([http://www.clemson.edu/cecas/departments/ece/faculty\\_staff/index.html](http://www.clemson.edu/cecas/departments/ece/faculty_staff/index.html))
- Clemson University Centers and Institutes (See Appendix 3 for details)

### Secondary Users:

- Students and faculty of departments whose subjects overlap with the interests of ECE, such as Computer Science, Bioengineering, Mechanical Engineering, Mathematics, and Physics
- Clemson Computing and Information Technology staff
- Researchers and Engineers employed by South Carolina companies

## General Collection Guidelines

The bulk of the collection is housed in Cooper Library, with the exception of some older books and print journal volumes and some more recent journal volumes duplicated in a stable online format (such as ScienceDirect) which are available in Offsite Storage.

### Scope of the Collection - Materials will be selected in electronic formats when available

- Reference Books, including handbooks, dictionaries, and encyclopedias. Electronic versions of important reference works are included in Knovel.
- Monographs – print and electronic – will be selected to support the research and coursework of undergraduate and graduate students as well as the research and teaching needs of the faculty. Books will be chosen very selectively, primarily in response to requests from faculty and students.
- Textbooks used in Clemson classes will not be purchased in print, unless they are deemed useful for other reasons. Nor will Clemson textbooks be supplied via Interlibrary Loan. However, eBook versions of textbooks may be purchased.
- Industry standards play an important role in the research process. Therefore, we will maintain a subscription to ASTM standards, and bibliographic access to additional standards through ANSI. Standards will be purchased on an as-needed basis, through InterLibrary Loan.
- Journals /serials / periodicals will be selected for two primary purposes: to support undergraduate research and coursework, and to support graduate and faculty research. No effort will be made to collect trade publications and general interest titles, although these titles might be included in Aggregators (databases such as Academic Search Complete, Lexis / Nexis.) See Appendix 5 for a list of titles of journals important to ECE.
- Several journal packages are vital to this collection, including Elsevier (ScienceDirect), Springer, and Wiley-Blackwell.

## **Languages**

Unless otherwise requested by a faculty member, all material will be written in English.

## **Date of Publication**

Most materials purchased will have been published within the preceding two years. Older works will be purchased at the request of a faculty member, to replace heavily used volumes that have been lost, or for which demand has been shown through Interlibrary Loan borrowing.

## **Geographical Guidelines**

I recognize the global nature of research, and the importance of representing a wide variety of points of view and international perspectives. However, due to serious budget constraints, materials originating/published in the United States will be the primary focus.

## **Format**

Wherever possible, reference works, indexes, and journals will be purchased in electronic formats and made available from the Libraries' Web site for access by students and faculty, on and off campus. Print materials will also be selected, when electronic is inappropriate. Materials in CD-ROM, microfilm/microfiche will be purchased only by request, and/or when it is the only format available. Materials on DVD will be purchased when requested by a faculty member.

## **Access to Information Not Available at Clemson**

### **Interlibrary Loan**

The primary means of access to materials not owned or accessible by the library is [Interlibrary Loan](#), a service available free to Clemson University students, faculty, and staff.

### **PASCAL Delivers**

Books available from other research institutions in South Carolina can be supplied by [Pascal Delivers](#), also free to Clemson University students, faculty and staff.

## **Selection, Evaluation, and Assessment Tools**

- Faculty requests and recommendations
- Faculty requests forwarded from ILL as books currently in print and good candidates for the collection
- Approval notifications from YBP identified as titles that fit the needs of the library's collection
- Vendor databases (such as YBP GOBI, and ScienceDirect)
- Review sources, e.g. *Choice*, *Books for College Libraries*, and *Magazines for Libraries*
- Indexes, bibliographies, and series lists
- Review of the teaching and research interests of the Electrical and Computer Engineering faculty
- Interlibrary loan and circulation activity
- Publishers' catalogs
- Usage statistics for databases, e-journals and e-books

## **Weeding Guidelines**

Books will be weeded from the collection if they are in poor condition and cannot be repaired. A replacement copy will be purchased, if available, for important titles. Duplicate copies of books that have not circulated, and material that is clearly outdated and not of historical interest will also be considered for weeding.

## Summary of Primary Subject Classifications, LC Call Numbers, and Collecting Levels

Subject	LC Class	Collecting Level
Electrical Engineering	TK1 – TK5100	grad/undergrad
Computer Engineering	TK5101-TK7895	grad/undergrad

### Key Engineering Databases \*particularly important to Electrical and Computer Engineering

*ACM Digital Library	MathSciNet
Agricultural & Environmental Science Database	MEDLINE with Full Text
Annual Reviews	*National Library of Energy
*Applied Science & Technology Full Text	*National Technical Reports Library (Public NTRL)
ASABE Standards	Perry's Chemical Engineers' Handbook
ASCE Library	PiraBase
ASME Digital Library	Polymer Library
*ASTM Standards & Digital Library	PsycINFO
BioMed Central	RefWorks
*Computer Source	SAE Mobilus
*Computing Research Repository (CoRR)	Science Reference Center
*Conference Proceedings Citation Index	SciFinder Scholar
Faulkner's Advisory on Computer and Communications Technology	Scitation
General Science Full Text	SciTech Premium Collection
GeoRef	Smithsonian Physical Tables
GreenFILE	*SPIE Digital Library
*Guide to Computing Literature	Springer eReference Works
*IEEE Xplore	SpringerMaterials
*IET eBooks	*Synthesis Digital Library of Engineering & Computer Science
*IET.TV	TAPPI Standards
*INSPEC	TAPPI TIPs and UMs
Kirk-Othmer Encyclopedia of Chemical Technology	Technology Collection
Knovel Critical Tables	Textile Technology Index
*Knovel Science and Technology Collection	TRID
Machinery's Handbook	Ullmann's Encyclopedia of Industrial Chemistry
Materials Science & Engineering Database	Yaws' Handbook of Thermodynamic & Physical ...

## Electrical and Computer Engineering

<http://www.clemson.edu/cecas/departments/ece/academics/undergrad/overview.html>

### The Undergraduate Program

To address the many aspects of Electrical Engineering and Computer Engineering, the undergraduate curriculum for these degree programs at Clemson University builds on the foundation of mathematical and physical sciences in a systematic manner to allow the student to progress into the current application areas associated with each field. For Electrical Engineering these areas include circuits, electronics, sensors, communications, controls, robotics, power, renewable energy, signal processing, and electromagnetics. For Computer Engineering, application areas include computer architecture, networks, network security, software enabled systems, programming systems, software engineering, digital systems design, embedded systems, high performance computing, communications, controls, robotics, image processing, and signal processing.

In addition to these technical skills, students learn to communicate effectively, both orally and with the written word. Because engineers work for the benefit of society, the curriculum includes a strong component of humanities and social science courses. Many project design assignments enable the development of interpersonal, teamwork, and management skills that are necessary for success in a professional engineering career.

### B.S. in Electrical Engineering

The Electrical Engineering curriculum gives breadth and depth in the subject areas of circuits, computer engineering, electromagnetic fields, electronics, controls, signal analysis, power systems, and communications. Technical electives in the senior year provide specialization.

### B.S. in Computer Engineering

The program in Computer Engineering leading to the B.S. degree provides an in-depth education in a wide range of computer topics including computer hardware, software, and applications. The Computer Engineering curriculum encompasses three basic threads: the software thread, the computer hardware and architecture thread, and the electrical engineering thread. Senior electives allow students to build on this foundation.

### Combined B.S./M.S. Degree Program

The ECE Department allows undergraduates to use a limited number of courses to satisfy some of the requirements of the Master of Science (M.S.) degree program while completing their Bachelor of Science (B.S.) degree. Specifically, undergraduate students, who have an overall GPR of 3.4, may use up to nine semester hours from an approved list of 600-level and 800-level of ECE graduate courses to simultaneously satisfy undergraduate technical elective requirements for the B.S. degree and some of the requirements of the M.S. degree. For more information on this program, see the [ECE Graduate Handbook](#).

Undergraduate students may choose to participate in the University's [Cooperative Education Program](#), which enables students to alternate semesters of work and study in order to gain practical experience while pursuing their educational goals. Cooperative Education represents a partnership between the University and participating industry, business and government organizations.

### Accreditation

The Bachelor of Science program in Electrical Engineering and the Bachelor of Science program in Computer Engineering are accredited by the Engineering Accreditation Commission of the Accreditation Board of Engineering and Technology (ABET).

## Undergraduate Courses and Programs

<https://www.clemson.edu/cecas/departments/ece/academics/undergrad/index.html>

**ECE Freshman Robotics Project:** In this project based course, freshman student teams build and program robots using MathWorks MATLAB software. These student teams compete against each other by designing, building, and programming a robot (e.g., an automated Rubik's Cube solver or a self-balancing Segway robot) to accomplish a given task in a design competition.

**Creative Inquiry Electronics Project:** In this project based course, student teams build, test, and analyze electronic circuits using the National Instrument myDAQ and LabVIEW software. These student teams compete against each other by designing and building an electronic system (e.g., a karaoke machine or an air guitar) to accomplish a given task in a design competition. For other current Creative Inquiry Projects in ECE, visit the [current projects Web site](#).

**iDevice Laboratory:** In the iDevice Laboratory, students receive instruction on programming and laboratory experience developing applications for the iPhone, iPod Touch, and iPad. These applications and devices are used in future labs.

**Biomedical Elective Technical Track:** The focus on health related issues is increasing the demand for better medical devices and equipment; hence, electrical and computer engineers are increasingly selecting job opportunities at hospitals, medical research corporation, equipment manufacturing firms, and government regulatory agencies. To address this need, the ECE department offers a biomedical elective technical track that focuses in the areas of organ replacement, bioinstrumentation, and bioimaging.

**Renewable Energy Elective Technical Track:** As the nation works to break its dependence on carbon-based fuel and increase the use of renewable energy sources, the potential widespread use of renewable resources represents a major paradigm shift for the electric power industry. To address this need, the ECE department offers a renewable energy elective technical track that focuses in the areas of solar power, wind power, and grid penetration.

**Electric Vehicle Elective Technical Track:** As vehicle electrification expands, the automotive industry's need for electric vehicle savvy engineers is growing, and hence, creating increased demand for the associated electronic and software engineering education. To address these issues, the ECE Department has created a new undergraduate-level elective track focused on key engineering skills for the development of electrified vehicles.

**Entrepreneurship Programs:** An Entrepreneur Minor is available to undergraduate graduate students in engineering and science disciplines across campus. This set of courses is intended to serve those students who desire to supplement their undergraduate engineering degree with expertise related to accounting, finance, management, new product development, and commercialization of inventions. In addition to the Entrepreneurship Minor, ECE students can also substitute ELE 301 - Executive Leadership and Entrepreneurship I or ELE 401 - Executive Leadership and Entrepreneurship II for one of the required Humanities Electives.

**Honors Program and Research Opportunities:** The ECE department has one of the most extensive honors programs in the college, consisting of six honors-only courses, taken during the sophomore and junior years and a senior honors thesis research project. In addition, students can gain valuable research related experience by working under the supervision of an ECE faculty member on a [Summer or Academic Year Research Project](#).

**Two-Semester Capstone Design Experience:**

**ECE 495 & ECE 496:** The capstone design experience is a team-based competition where small groups of students in the course compete against each other using state of the art equipment to program mechatronic systems for a given task. Students in a recent capstone design course programmed a miniature helicopter to automatically take off and fly to a designated landing area (See video clips below).

**IEEE Student Competition Project Course:** In this student-led course, ECE undergraduates work together to plan, build and program a robot to meet a challenge set forth each year for the IEEE Southeastcon Robotics Competition where they compete against teams from universities across the Southeast. Students are able to participate in this project course multiple times, gaining hands-on experience and leadership skill.

**Summer Online Courses:** All required courses in the undergraduate electrical engineering program and most of the required courses in the undergraduate computer engineering program are now offered online during summer sessions. These online courses allow students to take classes to stay on track during Co-op experiences, get ahead in the curriculum track, or retake a course while off-campus during the summer. The online lectures are also available as an additional resource for students taking the courses during the fall and spring semesters.

**ECE Plugged In:** The Electrical and Computer Engineering Plugged In Program at Clemson University is aimed at connecting current CU ECE students with ECE alumni or strong ECE advocates who serve as mentors. The ECE Plugged In Program mentors contact their mentee students throughout the academic year to help keep them motivated and excited about electrical and computer engineering.

**Combined B.S./M.S. Degree Program:** The ECE Department allows undergraduates to use a limited number of courses to satisfy some of the requirements of the Master of Science (M.S.) degree program while completing their Bachelor of Science (B.S.) degree. Specifically, undergraduate students, who have an overall GPR of 3.4, may use up to nine semester hours from an approved list of 600-level and 800-level of ECE graduate courses to simultaneously satisfy undergraduate technical elective requirements for the B.S. degree and some of the requirements of the M.S. degree. For more information on this program, see the [ECE Graduate Handbook](#).

**Newly Renovated Laboratories and Classrooms:** All classrooms and lab facilities in the ECE department's main building, Riggs Hall, have been recently renovated. All of the undergraduate laboratories are also furnished with modern National Instruments equipment and new computer systems.

## Electrical and Computer Engineering

<http://www.clemson.edu/cecas/departments/ece/academics/grad/index.html>

The Holcombe Department of Electrical and Computer Engineering offers M.S. and Ph.D. degrees in both Electrical Engineering and Computer Engineering. The M.S. program includes an all-coursework option and a thesis option. In addition, there is a Master of Engineering (M.Engr) degree program in Electrical Engineering available to off-campus students. The Ph.D. program includes a direct-entry option for suitably qualified students having completed a baccalaureate degree. The research activities of the Holcombe Department of Electrical and Computer Engineering are clustered into the four major areas of communications, electronics, computer systems architecture, and intelligent systems.

### Master of Science

#### Computer Engineering

The Computer Engineering program is a combination of computer software, hardware, systems and applications. Areas of specialization include computer systems architecture, communication networks, digital signal processing, and intelligent systems. Enrollment is open to graduates in any branch of engineering, computer science, or applied mathematics who have an appropriate engineering and/or science background.

#### Electrical Engineering

Students in Electrical Engineering may direct their programs toward the fields of communication systems and networks, digital signal processing, intelligent systems, applied electromagnetics, electronics, or power systems. Students may write a thesis or follow a nonthesis option. The thesis option requires a total of 30 credit hours including 6 hours of thesis research. For the nonthesis option, 33 credit hours of coursework must be completed, at least 18 of which must be at the 800 level. All MS students must take a final exam (oral and/or written) administered by their advisory committee.

### Master of Engineering

#### Electrical Engineering

The Master of Engineering is a special degree offered for off-campus students through the University tele-campus program. Degree requirements include 24 credit hours of coursework and six hours of credit for an engineering report. Additional information is available from the Office of Off-Campus, Distance and Continuing Education.

### Doctor of Philosophy

#### Computer Engineering

#### Electrical Engineering

The PhD degree requires at least 24 credit hours of graduate coursework beyond the master's degree. Specially qualified candidates with a BS degree may apply for direct entry to the PhD program in any of the above areas. Students in the direct-entry Ph.D. program are required to: i) take a minimum of 42 credit hours of approved course work, ii) pass the Ph.D. Qualifying Examination, iii) pass the Ph.D. Comprehensive Examination, and iv) write a dissertation that must be approved by the student's advisory committee and the Graduate School.

**Graduate Degree Programs in Photonics:** The Photonics Graduate Degree Program is an interdisciplinary degree program designed to expand a student's knowledge beyond the boundaries of traditional departmental based graduate programs. Specifically, graduate students, at the M.S. and Ph.D. level, participate in cross-departmental research, take application related classes from multiple engineering and science departments, and develop workplace related skills in a modern laboratory environment.



## Certificate Programs

**Engineering Education Certificate:** The Department of Engineering and Science Education offers graduate students in the Department of Electrical and Computer Engineering the opportunity to earn a Certificate in Engineering Education. This educational experience is designed for graduate students who seek experience in preparation for an academic career and wish to further their understanding of the education process in engineering. This certificate program includes a range of courses that may be chosen to address specific research questions or interests.

**Technology Entrepreneurship Certificate:** The Technology Entrepreneurship Certificate is available to graduate students in engineering and science disciplines across campus. The certificate is intended to serve those students who envision an entrepreneurial career as their long-range career goal, want to be involved in new product and new business activities within a corporate setting, or seek a better understanding of the process of commercializing inventions.

**Advanced Power Systems Engineering Certificate:** Recent blackouts around the world led the power engineering community to develop new, innovative methods for wide area monitoring, protection and control, wireless communication, and smart grid systems. Discussions with leaders in the power industry and academia indicate that many power engineers do not have the necessary background to tackle these challenging problems related to modern power systems. To address this need, the Advanced Power Systems Engineering Certificate Program provides power engineers with an opportunity to attack more sophisticated problems associated with power systems protection, dynamics/stability, transients, and distribution.

**ECE GAANN Fellowships for Doctoral Students:** The Holcombe Department of Electrical and Computer Engineering has received federal grants from the US Department of Education through the Graduate Assistance in Areas of National Need (GAANN) Fellowship Program. This program supports exceptional doctoral students in electrical and computer engineering who demonstrate financial need.

## Electrical and Computer Engineering

<https://www.clemson.edu/cecas/departments/ece/research/index.html>

The research programs of the department cover a wide spectrum of activities in the primary disciplines of communications, electromagnetics, mechatronics, electronics, photonics, computer architecture, power systems, and software enabled systems. The department is equipped with an extensive computer facility consisting of a variety of state-of-the-art mainframes, workstations, and personal computers located in several open laboratories and in a large number of specialized research laboratories. For organizational purposes, the department's research activities are clustered into the focus areas given below.

**Applied Electromagnetics** - [Anthony Q. Martin](#), [Liang Dong](#), Todd Hubing, [Eric Johnson](#), [Pingshan Wang](#), [Hai Xiao](#), and [Lin Zhu](#).

**Circuits** - [Richard Groff](#), [Liang Dong](#), [Rod Harrell](#), and [Pingshan Wang](#).

**Communications Systems and Networks** - [Harlan Russell](#), [Carl Baum](#), [Dan Noneaker](#), [Michael Pursley](#), and [K.C. Wang](#).

**Computer Systems Architecture** - [Melissa Smith](#), [Richard Brooks](#), [Adam Hoover](#), [Walt Ligon](#), [Robert Schalkoff](#), [Haiying Shen](#), [Ian Walker](#), and [Yongqiang Wang](#).

**Digital Signal Processing** - [Carl Baum](#) and [Robert Schalkoff](#).

**Electronics** - [W. Rod Harrell](#), [Eric G. Johnson](#), [Goutam Koley](#), [Rajendra Singh](#), [Pingshan Wang](#), and [Lin Zhu](#).

**Intelligent Systems** - [Richard Brooks](#), [Richard Groff](#), [Adam Hoover](#), [Robert Schalkoff](#), [Kumar Venayagamoorthy](#), [Ian Walker](#), and [Yongqiang Wang](#).

**Photonic Devices and Systems** - [Liang Dong](#), [Eric Johnson](#), [Hai Xiao](#), and [Lin Zhu](#).

**Power and Energy Systems** - The power and energy systems group focus on traditional electrical power systems as well as modern applications of renewable energy. Research projects are carried out in specific topics such as electric machinery, electric vehicles, microgrids, power systems analysis, power system security, and smart grids. [Keith Corzine](#), Randy Collins, Todd Hubing, [Elham Makram](#), [Rajendra Singh](#), and [Kumar Venayagamoorthy](#).

### Associated Research Laboratories

- Computational Electromagnetics
- [CU Electrical Power Research Association \(CUEPRA\)](#)
- [Microelectronics Research](#)
- [Parallel Architecture Research Laboratory](#)
- [Real-Time Power and Intelligent Systems \(RTPIS\) Laboratory](#)
- Power Quality and Industrial Applications Laboratory
- [Speech Processing Laboratory](#)
- [Vehicular Electronics Laboratory](#)
- Wireless Communications and Networks

## Associated Centers, Institutes, and Facilities

### Center for Optical Materials Science and Engineering Technologies

COMSET is an interdisciplinary research unit of the College of Engineering, Computing and Applied Sciences at Clemson University. COMSET provides an organized framework with significant centralized infrastructure for faculty having common interests to collaborate in developing advanced materials that exhibit a value-added interaction with light.

### Energy Research at the Clemson University Restoration Institute

The wind turbine drivetrain testing facility in North Charleston, SC will be capable of full-scale advanced testing of drivetrain systems, full nacelles, and simulation of blade forces. The facility will contain two test beds, a 7.5-megawatt and 15 megawatt, with dynamic non-torque loading. The addition of a 15 MW Hardware-In-the-Loop Grid Simulator leverages the electrical infrastructure of the wind turbine drivetrain testing facility and allows wind turbine generator manufacturers to test both mechanical and electrical characteristics of their machines in a well-controlled and calibrated environment.

### Clemson Computing & Information Technology

CCIT is the primary supplier of computing and information technology services to Clemson University. CCIT also maintains an outreach program that supports the computing activities of various state and federal agencies, educational institutions and private companies.

### Electron Microscope Facility

The Electron Microscopy Facility in the College of Sciences at Clemson University is fully staffed with qualified personnel to operate scanning electron microscopy ((SEM) JEOL SM810), transmission electron microscopy (TEM), energy dispersive x-ray analysis (EDXA), Auger, Atomic Force Microscopy (AFM), etc.

### Clemson University International Center for Automotive Research

The Clemson University International Center for Automotive Research (CU-ICAR) is a 250-acre automotive and motorsports research campus currently under construction in Greenville, South Carolina. The facility will include a graduate school offering Master's and Doctoral degrees in automotive engineering, and offering programs focused on systems integration.

### Center for Bioelectronics, Biosensors and Biochips

The Center for Bioelectronics, Biosensors and Biochips (C3B) is an integrative research and education enterprise that is oriented toward service, is actively managed and directed by the constituency it serves, and is focused on providing leadership and excellence to the scientific and technological area of bioelectronics, biosensors and biochips.

### IBIOE: Institute for Biological Interfaces of Engineering "at the forefront of biomaterials technologies"

The mission of IBIOE is to enable the development of clinically relevant biomaterials technology and products for disease management and the transfer of this technology for patient care through leading biomaterials-related research.

### IMSA: Intelligent Materials and Systems for Architecture **IMSA aspires to realize an animated Architecture**

IMSA is a Clemson University Research Group focusing on the design, development and evaluation of intelligent materials and systems for architecture. Partnering Architecture, Materials Science & Engineering, and Electrical & Computing Engineering, IMSA is responsive to the challenges and opportunities of a complex world.

### The Micro Fabrication Facility at Clemson University

The Micro Fabrication Facility at Clemson University is located within The Center for Optical Materials Science and Engineering Technologies (COMSET) at the Advanced Materials Research Lab (AMRL) in Anderson, SC. This facility provides academic and industry researchers easy access to a complete microelectronic, optoelectronic & MEMS fabrication facility. Processing includes cleaning wafers, and photolithography.