Reputation as one of the nation’s finest engineering schools is the primary reason that students chose to enroll at Georgia Tech for the 1992-1993 academic year. Since its founding in 1885, the college has created a tradition of high standards that the students maintained throughout the year.

The 1992 entering freshman class was one example of this excellence. With the highest average SAT scores in Tech history, they promised that they, too, would be able to uphold their school’s name.

Upperclassmen already knew what a challenge this often was. From the initial calculus, chemistry, and physics courses taken by all students to the highly specialized training offered by senior level courses, Tech’s demanding academic agenda moved all desiring high grades to study diligently.

Perhaps graduate students knew better than anyone the strength of Tech’s reputation. With degrees from schools around the world already in hand, they each chose Georgia Tech to further pursue their educational interests.

Whether a freshman, graduating senior, or graduate student, however, the stay at Georgia Tech made any student realize that a college can only provide elemental wisdom, the basis for the true knowledge that a person obtains only through life’s experiences.

Freshman mechanical engineering major Andrew Lee concentrates on his reading despite the inviting scenic view from a second story window of the Price Gilbert Memorial Library. Georgia Tech’s rigorous academic programs limited many students’ time for outdoor activities.

Photo by David Pauli.
John Patrick Crecine, president of the Georgia Institute of Technology, poses in his office in the administration building. Crecine came to Georgia Tech in 1988 and has since guided the school in its many needed changes and improvements. Photo by David Pauli.

Crecine discusses his plans for the future of Georgia Tech with a colleague. By communicating with the Institute's faculty and staff, Crecine was able to lead it through the preliminary Olympic plans and changes throughout the campus. Photo by Charles Clinton.

Crecine delivers his State of the Institute Address during October to students, faculty, and staff concerned about their school. In the annual address, the president informed the crowd of the many changes and achievements that affected the Institute over the past year. Photo by Charles Clinton.
Guiding Georgia Tech Through Change and Diversity
Crecine Focuses Institute on Achieving Ambitious Goals

The 1992-1993 year was a wide and varied one for John Patrick Crecine, president of the Georgia Institute of Technology. Surrounded by both praise and controversy, Crecine helped Georgia Tech become a more worldly and recognized institution and led it to higher standards of excellence.

The combination of improving standards for the freshman classes, increasing both the minority and female enrollments (the fall 1996 incoming freshman class should be approximately 40 percent female and 12 to 15 percent minority), and continuously recruiting the highest average SAT score in the United States (1226, 667 Math and 559 Verbal) prompted U.S. News and World Report to rank Georgia Tech in its top 20 in several areas. The magazine ranked Tech's School of Industrial and Systems Engineering first in the nation.

Based on Olympic needs for 1996, Crecine pushed through deals for the natatorium and new residence halls capable of housing 3,500 students. A new coliseum was also in the works along with many new facilities for the Tech community.

IBM recognized Georgia Tech and Crecine's leadership with one of its prestigious Total Quality Management awards, only eight of which were awarded throughout the nation. Also, during the year, several new professors were hired, many from industry and recognized leaders in their fields.

Additionally, Georgia Tech's international image improved because of the Olympic games and the growth of an expansion campus in Lorraine, France. In fact, an interactive computer program that was designed by Georgia Tech and presented to the International Olympic Committee was believed to be one of the many reasons why Atlanta was chosen as the site for the Centennial Games.

Crecine's direct dealings with students consisted of students from foreign countries, but this number was expected to increase over the next few years.

Leading the Institute through rocky waters, Crecine focused on the main goals of the school during the 1992-1993 year. By achieving these goals, he pushed Georgia Tech forward to better prepare students for a diverse and changing job market.

By Andrew W. Tipton
Administraion
Guiding the Institute

When one thinks of a major university, the things that come to mind include the campus itself, the students, and the faculty. But what about the day-to-day operations? Who takes care of those? At most universities, there is a whole staff dedicated solely to making sure that everything is taken care of—that professors are paid, that the facilities are maintained in working order, that the ledgers balance, and so forth. These are the unsung administrators— the people that exist but are normally overlooked.

Working closely with Dr. Crecine during the 1992-93 school year was a staff made up of administrators who make sure that everything runs smoothly. This was not an easy task for a community the size of Georgia Tech. This staff also worked with the Board of Regents, the Atlanta Committee for the Olympic Games, the International Olympic Committee, industry, the state and federal government, other universities, the Georgia Tech Research Institute, the students, and many other groups (both in Georgia and internationally) in order to keep Tech not only running properly, but also working at the leading edge of technology.

Whether they decided when new facilities were to be built, which new professors would be hired, or how much information would be given to the press, this administrative staff was actually in control of the direction of the Institute daily. Without these dedicated people, the machinery of Ma Tech would have quickly ground to a halt. The faculty and staff would not get paid, the facilities would not be cleaned and kept in good shape, the streets would be full of potholes, and students would all be ashamed to say that they attended Tech. But this rarely happens because the infrastructure is so strong.

Tech owes a lot to the administrative staff here, not only because they do a good job of keeping the university running and developing, but also because they are dedicated to making school the best that it can be. This dedication has been reflected over the past year in two awards that have been presented to Tech: the IBM Total Quality Management award, and the ranking of Tech in the top ten engineering schools by U.S. News and World Report. With these awards under its belt and the administration working strong, Tech should continue to emerge as one of the premier technological schools in the world as its students head into the twenty-first century.

By Andrew W. Tipton.
Richard Truly
Executive Director, GTRI

Homer Rice
Executive Assistant/Athletic Director

Michael Thomas
Executive Vice President

Gary Poehlein
Executive Assistant to the President

Norman Johnson
Special Assistant to the President

John Carter speaks about Tech policy while Roger Wehrle listens. Through public meetings, administrators learned about student concerns. Photo by David Pauli.
The Carnegie Building, a symbol of wisdom and strength, houses most of Georgia Tech's administrators. Students often just walk in with questions for the President. Photo by Brian Niece.

Roger Wehrle
Vice President for Student Services
Top Researchers Maintain Tech's Strong Reputation

Over the years, Georgia Tech has built a reputation as the strongest research institute in the southern United States and one of the strongest in the nation and the world. That respect grew from the dedication of Tech's many researchers—professors and other Institute personnel who work with as much dedication in the laboratory as they do in the classroom.

The contributions of these many professors benefited the Georgia Tech of 1992-1993 in many ways. Through their work the researchers made discoveries that they could later share with students in their classrooms. When exposed to a first-hand study of new ideas or findings, students were more receptive to the information that the professor was teaching. Some students were even drawn to the research facilities on campus where they could often work on the laboratory projects as a student assistant. Both laboratories within the Institute's schools and colleges and the laboratories of the Georgia Tech Research Institute (GTRI) made these types of programs available to Tech students.

The many projects likewise drew world-wide attention to Georgia Tech. Corporations of various industries, eager to support the new innovations in science and technology, poured monetary contributions both into Tech's general research funds and into particular research projects that caught their interest.

The most important drive for many of the researchers, however, was the contributions that they were making to their various fields of science, engineering, or industry. They realized that their work would become the foundation of tomorrow's technology, and they pursued that goal above all others.

All of these professors who do research on the side help to give Georgia Tech its good reputation.”
—Peter Newby

by Michael Williams
Kevin Brennan
High Definition Systems

John Copeland
Technology Transfer Chair

Bill Hunt
High Definition Systems

Andrew Peterson
National Science Foundation Award

Ajeet Rohatgi
Photovoltaics

Ronald Schafer
National Science Foundation Award

Terry Snell
Biology Award
Top Researchers Maintain Tech’s Strong Reputation

Researchers of the Georgia Institute of Technology spend time out of the classroom working on their various projects. From architecture to communications to computer science to chemistry, all colleges and schools within Georgia Tech sponsored research that helped the Institute maintain its reputation for excellence. Photos by Georgia Tech.

A chemical engineering student participates in a laboratory project. Research projects at Georgia Tech often provide ways for interested students to get involved. Photo by Brandon Yee.
Winning in the International Market

Radwan Shaban, Assistant Professor of Economics, was awarded one of the prestigious McNamara Fellowships for the 1992-93 school year. The World Bank annually awards just ten of these prestigious fellowships in an international competition. Named for the former President of the World Bank, the fellowship is intended to support innovative and imaginative research emphasizing the public policy aspects of economic development by scholars less than 35 years of age.

The award carries a stipend of $30,000 for various expenses such as travel subsistence, medical insurance, and research costs over a twelve-month period, six months of which are expected to be abroad. Shaban used the award to study "Changes in Land Ownership and Their Determinants" in India.

After earning undergraduate degrees in both economics and engineering at Swarthmore College, Shaban received his Ph.D. in Economics from Stanford University. Shaban then held a position at the University of Pennsylvania until he came to Tech during the Fall quarter of 1991.

While working with Tech's international programs, Shaban has become an active faculty member nationally and internationally with his achievements improving Tech's international standing and visibility. He authored many papers concentrating mainly on economics in the Middle East. Two of his three papers written during the school year were accepted for publication: one on the West Bank and Gaza Strip under Israeli Occupation and the other on labor mobility of Palestinians.

Shaban was also active as guest speaker throughout the nation. He made seven seminar and conference presentations during his first seven months as a faculty member at Tech. His topics have been diverse, including land ownership and share tenancy in underdeveloped countries, the adoption of technology, the Palestinian question from the perspective of economic integration, and the economics of the Middle East after the Gulf War.

Because of outstanding professors like Shaban, Georgia Tech's reputation and quality as a school has spread worldwide. Hard work like Shaban's has aided Tech in its quest to become known internationally.
College of Architecture
Designing the Future
by Liz Vanderbilt

The College of Architecture offers undergraduate programs in Architecture, Building Construction, and Industrial Design leading to the Bachelor of Science degree. In addition, graduate programs in architecture and city planning leading to the Master of Architecture, Master of City Planning, Master of Science, and Doctor of Philosophy degrees are also offered.

Building construction majors can focus their studies in one of three areas: construction management, construction science, or construction development. Students in these fields take a wide range of courses ranging from science and math to management to architectural history. Building construction also offers a certificate program which is used by many architecture and civil engineering students to broaden their education.

Industrial design offers a well-rounded course of study with early emphasis on basic design. Projects stress realistic design situations, and most faculty members are practicing designers with extensive experience in the field.

The original mission of the College, established as the Department of Architecture in 1908, was to prepare students for the professional practice of architecture. Becoming the School of Architecture in 1948 and the College of Architecture in 1975, the mission of the College has expanded to provide both continued leadership and to respond to changes in the professions and society. From its original focus on the practice of architecture, the College has become a multidisciplinary setting for teaching, research, and service at every scale of the constructed environment ranging from the design and production of the smallest utilitarian object to the planning and design of the city.

Checking to see if the pieces fit, an architecture student completes a preliminary model. Architecture studios required students to redo projects several times until they were satisfied with the results. Photo by Matt Bacar.
Thomas D. Galloway has recently taken over as the new Dean of the College of Architecture. His appointment took place after a long search by a committee of faculty, administrators, and students.

Dr. Galloway received his Bachelor's degree in sociology from Westmont College in Santa Barbara. He obtained a master's degree and Ph.D. in urban planning from the University of Washington. Dr. Galloway is married and has three children and three grandchildren.

Construction research is a growing area of Georgia Tech. Dean Galloway's goal is for students to become more involved in these research projects. He sees this as a positive step for students and the construction research centers.

Dean Galloway also feels that it is important that students have a voice in the college. A group is now forming for students in all departments of the college including representatives from groups such as the Student Construction Association and the American Institute of Architects.

Academics 75
School of Architecture

Teaching Design Principles

by Liz Vanderbilt

The School of Architecture bases its program on a “four-plus-two” basis. A nonprofessional Bachelor of Science degree is awarded after four years of study. The Master of Architecture degree requires an additional two years. A student must attain the master’s degree to receive professional recognition by the National Architectural Accrediting Board and the National Council of Architectural Registration Boards.

The curriculum is designed to be flexible enough to allow students to pursue interests in other fields as well as prepare the student for graduate studies. Many courses which are optional for the undergraduate degree are required for admission to the graduate program.

The master’s degree programs in architecture have two parallel and mutually dependent objectives. The first is to provide multidisciplinary graduate study in architecture that is oriented to intellectual inquiry, scholarship, and research. The second is to provide a professional education in architecture at the highest levels of accomplishment and aimed toward the leadership of the profession. Graduate study in architecture, therefore, is concerned with theory and practice, research and design, and confirmation of traditions as well as expansion of the limits of the discipline and practice of architecture.

All master’s degree programs have curricula structured around a core of courses that engage architectural theory, research, and practice within the framework of the city as a critical setting for architecture.
Putting the finishing touches on a sketch, a student listens to the radio on her headset. The architecture building provided rooms for its students where they could work on projects any time of day without being disturbed. Photo by Matt Baclar.

A student studies for an upcoming exam. Classes needed for an architecture degree were difficult, and students were required to learn disciplines from art to structures. Photo by Ted McCrobie.

Leaning over his drawing board, an architecture student erases a stray line from his pencil sketch. Students often had to redraw a single sketch several times before creating one acceptable for submission to his or her professor. Photo by Matt Baclar.
It is difficult to ignore the fact that, in almost every aspect of modern society, computers play a key role. Areas such as research, the economy, medical research, and education would not take place without the use of the advanced computing facilities now taken for granted. In recognition of the interdisciplinary range of computing and the necessity of its continued development, the College of Computing (COC) was formed.

In 1963, Georgia Tech created the School of Information Science with the sponsorship of the National Science Foundation. As the school expanded and grew throughout the years, it became the School of Information Systems, then the School of Information and Computer Science in 1972. Finally, in 1990, it was transformed into the College of Computing in response to the changing curriculum requirements of Tech.

The College consists of the School of Computer Science. Bachelors, masters, and doctoral degrees are offered in this field as well as a certificate in Information Systems awarded jointly with the School of Management. As part of the educational process, students can engage in research areas suited to their interests. The COC is involved in a broad range of fields including artificial intelligence and robotics, cognitive science, computer vision, database systems, programming languages and environments, software engineering, and theoretical computer science. Three centers associated with the college further focus research activities: the Software Research Center, the Center for Information and Management Research, and the Graphics, Visualization, and Usability (GVU) center. Located on the second floor of the College of Computing building, the GVU center is by far the most popularly recognized of the three. The center's focus is to find ways to make computers more accessible and usable by ordinary people. To accomplish this goal, emphasis is placed on developing methods to improve communication between computers and persons. The GVU center draws its researchers and grad students not only from the COC but from many other schools and campus organizations such as the Office of Information Technology, the Schools of Civil Engineering, Mathematics, and Literature, Communication and Culture, and the Multimedia Technology Lab. State of the art computer graphics hardware and software are used in the areas of realistic imagery, algorithm imagery, animation, stereoscopic graphics, and virtual environments.

In support of its educational and research activities, the college maintains a large variety of computer systems. All these facilities are connected through local networks, which are in turn joined to a campus-wide network, that allows access throughout the Tech community. These networking facilities give the campus direct access to Internet, thus allowing communication with the scientific community throughout the world.

As technology continues to advance, computers will continue to permeate our society. The College of Computing is steadfast in its goal of providing leadership in the creation of human resources and scientific understanding necessary for the 21st century.

Working diligently on a project, a student takes advantage of one of the computer clusters available on the Georgia Tech campus. The College of Computing maintained software that allowed students to submit their assignments to professors via computer. Photo by Paige Pinson.
Dean of the College of Computing Peter A. Freeman received his Ph.D. in Computer Science at Carnegie Mellon University. He then served on the faculty of the Department of Information and Computer Science at the University of California, Irvine, for nearly 20 years. From 1987 until 1989, he served as division director for computer and computation research at the National Science Foundation where he was part of the committee that formulated the high-performance computing and communications initiative. Before he came to Georgia Tech, he was visiting Distinguished Professor of Information Technology at George Mason University.

Upon hearing of the reorganization of the curriculum at the Georgia Institute of Technology, which would subsequently create the College of Computing, Dean Freeman decided that this was where he wanted to be. "I recognized that it was a real opportunity to help create something new that will be at the forefront [of computer science research]." He believes that Georgia Tech is taking the lead in an area of education and research that will become increasingly important in the future.

Dean Freeman is a member of the Board of Visitors of the Computer Science Division of the Office of Naval Research, and is vice-chair of the computing research association. He is the author of several textbooks and numerous technical papers. He was also the founding editor of the McGraw-Hill Series of Software Engineering and Technology.

Taking a trip in virtual reality, this student attempts to reach out and touch the computer images he sees through his helmet. The College of Computing was a major contributor to the research and development of advances in computer technology.

After working throughout the night on their computer project, tired students put the finishing touches on their homework in the GVU lab. Computer Science classes required many difficult computer programming projects; however, students found that the homework helped them to better understand how to implement computers to solve real-world problems.
Computer Science
Putting Technology at the World's Fingertips

by Stephen Burr

As new advances in technology continue to alter the business world, one quickly realizes the ever increasing need for computer literate employees. A person must be able to learn the new and ever-changing skills needed to survive in today's competitive market. To meet this demand, the College of Computing (CoC) set up a curriculum to prepare students for the challenges of this new, technically oriented world.

In 1972, the undergraduate program of the CoC was established, and has been accredited by the Computing Science Accreditation Board, Inc. To better prepare students for their future professions, the program has recently undergone major reforms. Emphasis for reform was placed on the freshman and sophomore courses in order to better teach the methods involved in solving computational problems. The program also ensures a broad base of experience in science, engineering, and management disciplines. Higher level courses focus on development in computational theory, languages, software, and computer architecture. Senior students pursue two areas of specialization as a requirement for graduation, choosing from areas such as artificial intelligence, computer hardware design, software development, networking, software engineering, among others. Completion of a final design project leads to graduation with the degree of Bachelor of Science in Information and Computer Science.

For those wishing to continue their academic studies, the CoC offers master's and doctorate programs. Those who enter the Master of Science program are then trained for professional careers in technical-managerial positions and are prepared for studies at the doctoral level. For doctoral studies, creativity, depth of knowledge in computer science, personal research and a high degree of excellence are required in order to graduate with the degree of Doctor of Philosophy.

The influence of computer technology on the world marketplace cannot be ignored. The high standards of the Computer Science curriculum at Georgia Tech ensure that graduates will always be able to make a place for themselves.

These Computer Science students work diligently on a lab. Many students find themselves spending many hours behind a terminal. Photo by Vincent Hill.
This student receives attention from one of the assistants in the DEC lab located in the College of Computing building. Photo by Vincent Hill.

Work in many Computer Science classes is time-consuming, as this student begins to discover. Photo by David Pauli.
The College of Engineering, known among students as the North Avenue Trade School, consists of eight different schools. These schools, Aerospace Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering, Industrial and Systems Engineering, Materials Engineering, Mechanical Engineering, and Textile Engineering, offer a variety of bachelor's, master's, and doctoral degrees. Being such a large college and sporting some 300 faculty members, Georgia Tech is near the top in the nation in graduating the most engineers in a year's time. Even at that quantity, though, the college does not sacrifice the quality of its students or their education.

Georgia Tech's reputation is predominantly established through engineering. The need for technological advancements in engineering was the premise for founding the Georgia School of Technology in 1885. The school's statement of purpose states that: "The purpose of Georgia Institute of Technology is to contribute to the fulfillment of the scientific and technical needs of the state of Georgia through education, research, and service."

Most of the degree offerings within the school require the same course curriculum for around the first year and a half of undergraduate study. John White, Dean of the College of Engineering, expresses that in our technological age, "this [technology] is the liberal arts education." Through multi-disciplinary study, students can even earn certificates in other programs of study.

The future ambitions of the College of Engineering include the desire to implement more cross-disciplinary projects. These goals ideally would bring together the specialized skills of certain individuals from different majors to collaborate as a group on a given project. An example would be the exhaustive design of a building which could include most the college's engineering fields and crossover into the College of Architecture.

Recent news of Georgia Tech as a recipient of IBM's quality award or Total Quality Management (TQM), presents more future changes on the horizon for the Institute and the College of Engineering. President Crecine has stressed the need for "continuous improvement" in maintaining Tech as a leading educator, researcher, and practitioner of TQM. White shares the president's ambition for change, and he will inevitably bring changes to the curriculum, faculty, and student body within the College of Engineering.
The Dean of the College of Engineering, Dr. John White, has the appointed task of leading a faculty of approximately 300 individuals in some kind of collaborative direction. This direction or goal maintains an ambiguous identity when preparing Georgia Tech graduates for cutting-edge technology. This challenge, in Dr. White's estimate, is no more difficult than that of emphasizing the Institute's priorities to this elaborate staff in the "world of academe". These priorities, Dean White alleges, are to work as a whole for the furthering of the college and, more importantly, the students en-route to the professional world and a changing society.

Dean White came into engineering by chance. The fit was like, in White's words, "a square peg in a square hole". He loved it from the beginning days of undergraduate work in his home state of Arkansas. While continuing study for his master's degree part time, he went on to work as an engineer for Kodak. He eventually completed his master's work at the University of Virginia. White began to teach because he needed to support his family of four while completing his doctoral studies at Ohio State University. He subsequently decided upon education as a career. He has since spent his years as an ISYE professor at Georgia Tech, minus a leave while serving as assistant director of the National Science Foundation in Washington, D.C. When he returned to Georgia Tech, White assumed office as Dean of the College of Engineering. Besides his duties as Dean, White has headed the search committee for a dean for the College of Architecture, and he still teaches at least one class per quarter. White feels he is "first and foremost a teacher."

Dean White expresses interest and concern for the future of Georgia Tech. He cites that there are few schools similar in character and believes the Institute must embrace a degree of change to stay with the times. Interests White holds include cross-disciplinary projects, increased minority enrollment, and continued practice and implementation of computers.
Dr. G.A. Pierce
Interim Director

Dr. George Alvin Pierce has been a driving force behind the Aerospace Engineering program at Georgia Tech since 1966. As a teacher, he has consistently received remarkable ratings from both students and the Center for Education, Teaching, and Learning. As a director, he continues to push Tech to the top of the Aerospace Engineering schools.

After graduating from the Massachusetts Institute of Technology with a Bachelor of Science in Aeronautical Engineering in 1953 and earning his Ph.D. from Ohio State University in Aeronautical and Astronautical Engineering in 1966, Dr. Pierce began work for Georgia Tech as an associate professor. In 1973, he became a professor. Dr. Pierce now serves roles as Interim Director and Associate Director for Research and Graduate Studies.

While at Georgia Tech, Dr. Pierce has been the advisor for 20 Ph.D. students and 70 M.S. students. He has published numerous publications dealing with Aerospace Engineering that range from suppressing helicopter vibrations to "Boundary Layer Studies in Rarefied Plasma Flows".

Dr. Pierce has served as the AIAA Representative to ABET, a committee that decides on the accreditation of Aerospace Engineering schools. He has been a guest instructor to the Midwestern Simulation Council, the University of Tennessee Space Institute, and the Lockheed-Georgia Company. A tremendous source of Aerospace Engineering knowledge, Dr. Pierce has served on numerous committees, done consulting for many Engineering firms, belonged to many societies, and received an abundance of awards, including Most Valuable Professor in the School of Aerospace Engineering.

These students put in extra hours on their Aerospace Engineering projects. Photo by Mike Mayer.

An Aerospace Engineering student puts the finishing project on his lab project. Photo by Mike Mayer.
The Daniel Guggenheim School of Aeronautics was established in 1930. Since its founding, it has been the home of Aerospace Engineering at Georgia Tech. The head of this department is Dr. G. Alvin Pierce. The School of Aerospace Engineering is small compared to some of the engineering schools on campus, but it ranks among the top aerospace engineering departments in the nation. It graduated over 140 graduate and undergraduate students in 1992. The school offers a variety of research areas.

On campus, four buildings with a total of 88,000 square feet have been devoted to Aerospace Engineering. Most of this space has been used for instructional and research laboratories.

Students who have earned the Aerospace Engineering degree have worked on the design, manufacturing, and function of aircraft including the method of propulsion and stability of materials in flight. They have also gained experience in the use of Computer Aided Design and Computer Aided Manufacturing to help them in their careers.

The School of Aeronautics had 27 faculty members and three appointed members. The school graduated 75 seniors with bachelor degrees in Aerospace Engineering. It gave out 50 masters and 20 Ph. D. degrees last year, even though it was a very small department.

The School of Aerospace Engineering has ranked high among Aerospace Engineering schools in the nation. It has spent about six million dollars on research (the third highest in the nation). It also ranked the fourth highest in the research expenditures per faculty member in 1992 with about $213,000 per professor going towards advancement in the field.

The School of Aerospace Engineering has traditionally involved various areas of research including aeroelasticity, aerospace systems design, flight mechanics and control, fluid mechanics, propulsion, and structures. The research done in this school has spanned more than just areas dealing with flight vehicles. For example, since the cold war ended, the military has not been as important as before. One of the research areas involved has specialized in finding ways to transform some of the military machines for civilian use. The School of Aerospace Engineering has done research for the military, The National Aeronautics and Space Administration, the National Science Foundation, the Environmental Protection Agency, the Federal Aviation Administration, and other federal agencies, as well as other industries.

Aerospace Engineering
Flying into the Future

by Jean Chen
Dr. Ronald Rousseau, Director

Dr. Ronald W. Rosseau has been the director of the School of Chemical Engineering at Georgia Tech for six years. He graduated from Louisiana State University after receiving both undergraduate and graduate degrees in Chemical Engineering. He then taught at North Carolina State University and later came to Georgia Tech to become the Director of the School of Chemical Engineering.

Besides his duties as the director of the School of Chemical Engineering, he teaches a graduate course in separations and an undergraduate course, Chemical Process Principals. When teaching students, he convinces them that what they are doing is important. He also emphasizes the importance of enjoying this type of work in chemical engineering.

Dr. Rosseau became interested in chemical engineering because he had plenty of exposure to this field. Dr. Rosseau’s birthplace was Baton Rouge, LA, the center of the United States’ chemical industry.

When asked about the effects of the recession on the chemical engineering field, Rosseau stated that chemical engineers were having difficulties in finding jobs. He said that the chemical engineering field is still strong but not as strong as in past years. Still, the chemical engineering field has many more opportunities than most other fields.

Demonstrating the usage of a phase heat exchange boiler, Gary Pansino gives a knob a twist and waits for a result. Learning about various equipment used in chemical process was an important part of a chemical engineering education. Photo by Brandon Yee.

Chemical Engineering

Preparing Students for Industry

The School of Chemical Engineering is one of the oldest of its kind in the United States. During the late 1950's and early 1960's, the Chemical Engineering program moved from Lyman Hall to the Bunger Henry building where it currently resides. The School of Chemical Engineering shares this building with materials and ceramic engineering and the three areas share several common classes. Faculty members from both schools work with the faculty of the School of Chemical Engineering.

The School of Chemical Engineering has a variety of programs including strong interdisciplinary programs. These include bioengineering, polymers, separations, and microelectronics. The school also offers programs leading to the Bachelor of Chemical Engineering, Master of Science in Chemical Engineering, and Doctor of Philosophy.

Chemical engineers perform many important functions in industries that convert raw materials into useful finished products by means of both chemical and physical processes. Almost every manufacturing industry employs chemical engineers in research, development, design, production, sales, consulting, and management. Such industrial manufacturing companies include petroleum, petrochemical, pulp and paper, plastics, metallurgical, fiber, fertilizer, nuclear energy, space, rubber, food, photographic, heavy and fine chemicals, mineral, pharmaceutical, textile, electronic, and dye. The protection of the environment and pollution control also have certain activities which require chemical engineers.

The School of Chemical Engineering's goal is to train students for positions immediately upon graduation and to give students a firm background for additional study leading to master's and doctoral degrees.

Working together to complete a project, Sunil Shah, Gary Reed, and Christine Lang use a computer to measure out precise quantities of chemicals. Laboratory work helped students understand the chemical and physical processes that industry uses to convert raw materials into useful products. Photo by Brandon Yee

Explaining his hypothesis, Greg Goolsby states what he believes will be the result of his experiment. Laboratories were a required part of the chemical engineering curriculum. Photo by Brandon Yee.
The School of Civil Engineering at Georgia Tech is located in the Mason Building, adjacent to the familiar Howey Physics Building. The school offers undergraduate courses in civil engineering, engineering science, mechanics, and engineering computer graphics. In addition to its undergraduate offerings, the school offers many Masters and Ph.D. specialties. It is the third largest school at Georgia Tech with more than 900 students pursuing degrees in civil engineering or related disciplines.

Civil engineers can best be described as "infrastructure specialists." They concern themselves with the infrastructure problems and issues which many of us take for granted. Civil engineers do not just construct buildings, they are responsible for transportation issues, traffic flow, hydraulics, fluid dynamics, water conservation, structural testing, geotechnical studies and environmental engineering. Their importance to the world's current ecological situation is paramount.

The School of Civil Engineering has been rated within the top twenty-five graduate and undergraduate schools in the country. In 1989, it was rated third nationally by the National Science Foundation for the amount of civil engineering research conducted. The school is constantly striving to maintain its standing and improve its facilities.

Civil engineers are constantly challenged to create environmentally safe building materials. They concern themselves with developing better transportation systems, insuring safe water supplies, and providing buildings for homes and businesses. In addition, they study earthquakes and other natural disasters to determine their causes and warning signs. Without the expertise civil engineers provide, many of the systems required for the survival and growth of the world economy would not exist.

Students pursuing a undergraduate degree from the School of Civil Engineering have two distinct paths open to them. The school offers Bachelor of Science degrees in Civil Engineering and Engineering Science and Mechanics. The major philosophy of the school is to provide a firm foundation in the rudiments of civil engineering. Students are required to do in-depth studies in mechanics, surveying, computer simulation, graphical design, fluid dynamics, geotechnology, and materials engineering. Each of these has classroom instruction supplemented by laboratory exposure to the various phenomena under consideration. By taking classes in each of these areas, students are exposed to all areas in civil engineering.

Master of Science candidates, who comprise over twenty-five percent of the school's students, have many more opportunities to specialize within their area of interest. Graduate study in civil engineering allows students to specialize in hydraulics, hydrology (water management), fluid mechanics, construction management, transportation, environmental engineering, engineering science and mechanics, and geotechnical/material engineering. The well qualified faculty and excellent research facilities combine to make a curriculum which more than adequately prepares graduate students for the challenges that will face them in their chosen field.

In addition to bachelors and masters degrees, the School of Civil Engineering offers Ph.D. work for interested students. The Doctor of Philosophy program in civil engineering has no preset requirements, however most doctoral students spend approximately two years in course work beyond the bachelors degree, plus at least one year of full-time research.

Civil Engineering has many state-of-the art facilities available for both undergraduate and graduate research. They have two large hydraulic laboratories suitable for both fundamental and applied research. Each is well supported by various instrumentation and data acquisition devices. In addition to the physical facilities the school offers well equipped computer facilities for design, evaluation and simulation in all major areas.

Currently research is being done in visual simulation of construction processes. Dr. Walter Rodriguez and his collaborators are developing a dynamic 3-D system to allow for interactive simulation of buildings. This system will allow civil engineers a view of the mechanical necessary in the construction of large projects. Also Dr. Christine Tiller is investigating the tracking of pollutants and particles in water systems. This will allow for more effective removal and treatment of these contaminants, thus lessening their impact on humans and the environment. Research is also being done in the area of composite materials. Dr. Abdul-Hamid Zureich is using this research to help efforts in rehabilitation of bridges, buildings, and other existing structures.

The students, facilities, faculty, and the research being done all contribute to Georgia Tech's national recognition with an excellent program in civil engineering.

by Mitchell Ingle
Dr. Jean-Lou A. Chameau, Director

Dr. Jean-Lou A. Chameau, director of the School of Civil Engineering, has held his position for fifteen months. He came from France in 1976 to attend Stanford University where he received his Master's and Ph.D. degrees. He then taught at Purdue University for ten years before coming to Georgia Tech. His field of specialization is in Geomechanical/Geotechnical Engineering. He concentrated mostly on earthquake problems such as the effect of dynamic loads on solids and solid-structure interaction.

Dr. Chameau feels that it is important for Civil Engineering students to learn how to think. He would like for students to learn to solve a problem by knowing how to approach it. His opinion is that knowing how to approach a problem to get a particular solution is more useful than knowing how to solve every problem or learning all there is to learn. "By going through the solutions of different problems," he says, "students will learn how to solve the problems they will face in the future."

When asked about the availability of jobs for civil engineers, Chameau states, "the job situation has fared fairly well through the recession, especially for people with degrees from major schools like Georgia Tech." He expects major opportunities soon due to the lessening of the recession and due to the fact that the environmental issues civil engineers deal with have become a popular concern. These matters, along with issues involving the national infrastructure, have produced major opportunities for people with civil engineering degrees, states Chameau.

Under the excellent leadership of Chameau, there are major changes going on in the civil engineering department in an effort to assist the students. There are plans to hire additional faculty members who are "very good teachers and have very dynamic personalities." The recent opening of three new computer laboratories began an effort to improve the computing facilities of the school. Major improvements to the structure and content of many undergraduate laboratories are being made, and many student projects will be related to real industry concerns. The Civil Engineering department is also taking steps toward improving the advisement system so that students are provided with as much information as possible.
Dr. Roger P. Webb, Director

Dr. Roger Webb has an extensive educational background. He received his Bachelor of Science degree in Electrical Engineering in 1957 and his Master’s degree in Electrical Engineering from the University of Southern California in 1959. He continued his educational achievement by receiving his Doctorate degree from the Georgia Institute of Technology in 1964.

Since 1964, Dr. Webb has been on the E.E. faculty at the Georgia Institute of Technology, where he is active in teaching, research, and program development. Dr. Webb has held the Georgia Power Company Distinguished Professorship since 1972. In this capacity he has coordinated efforts at the Institute in instructional and research program development in electrical power engineering. He was Associate Director from 1978 to 1989. In 1990 he became the Director of the School of Electrical Engineering.

Dr. Webb has received many awards for outstanding achievement in power engineering. He was the recipient of the 1983 Edison Electric Institute Power Engineering Educator Award. Professor Webb is also a Fellow of the Institute of Electrical and Electronic Engineers. He has worked for Sperry Phoenix Company and Douglas Aircraft Company as a consultant in numerous industrial areas.

Dr. Webb’s current research interests are related to the analysis and design of electrical power systems. His research has involved development of computer-based techniques for analysis of power systems.

In his capacity as Director of the School of Electrical Engineering, Dr. Webb is in charge of over 150 E.E. professors—by far the largest faculty of any school at Georgia Tech. Dr. Webb’s efforts and program coordination has undoubtedly been beneficial as E.E. continues to be a major benefactor in private, commercial, and government research. This commitment to research guarantees to the students a constantly updated educational environment.

**Electrical Engineering Faculty**

The School of Electrical Engineering is the largest school at Georgia Tech; it has well over 1,800 students in attendance. Of these students, more than one-third of them are graduate students. Students are offered classes in many different fields of study. The diverse curriculum allows students to structure their degrees with a high degree of accuracy.

As of 1992 there were nine major areas of study offered to students, and the vast amount of research completed by the school insures that students are kept at the leading edge of technology.

The first area is Computer Engineering, a curriculum designed around areas of digital design, computer architecture, and applications in computers. The area of digital design includes classical digital logic design, computer aided design, and very large scale integrated circuit design. Computer architecture courses center around robotics, computer networks, and distributed processing. The computer applications field concerns itself with Computer Aided Engineering/Design, digital signal processing, control systems, and microelectronics.

The second area is Electrical Power, a broad-based area encompassing many aspects of electrical engineering that concerns itself with the development, maintenance, and generation of electrical power.

The third area is Microelectronics, an area which involves design, growth, analysis, and the actual fabrication of integrated circuits. The microelectronics curriculum stresses semiconductor, transistor, and operational amplifier characteristics. The newest building in the E.E. complex, the Microelectronic Research Center, is dedicated to experimental research in this area, again insuring that students have access to the most current information in their field.

Another field of study is Opto-electronics, the study of laser applications. It has many courses from introductory to high level joint classes with the School of Physics. Other areas of concern in opto-electronics are optical processing techniques, nonlinear optics, optical communication, optical data storage, optical systems design, and holography.

The fifth area available for study is electromagnetic theory. E-mag, as it is called, is the study of the laws which form the base upon which all of electrical engineering technologies are built. Electromagnetics deals with the study of Maxwell's Equations and their applications to design and analysis techniques.

Another area, closely matched to electromagnetics, is Electronic Design and Applications. This field concerns itself with the integration of existing technologies, circuit principles, and systems analysis. This area places stress on the application of electrical engineering technology to devices that can be used in both industry and experimental goods.

The seventh area available is Telecommunications, which deals with transmission, storage, and networking of information. Information, its form, and its content are the major concerns for people who work in this field. The curriculum in this area stresses probability and statistical analysis of systems, random processes, and design of information transmission systems.

The eighth major area available for students is Signal Processing. This area is concerned with the representation, analysis, and transformation of information-bearing electro-magnetic waveforms. Signal processing has many applications in biomedicine, radar, seismology, speech synthesis, acoustics, and video communications.

The final area of major scope available to students is Systems and Controls. This area deals with mathematical modeling, analysis, and testing of entire systems for factors of stability, uncertainty, and lifetime. Practical problems in this area include robotic systems, intelligent control devices, and estimation of electrical/electronic characteristics.

The School of Electrical Engineering is a diverse environment with many available educational areas. E.E. is committed to excellence in electrical engineering with ninety-seven percent of all graduating student passing their Engineer In Training test with the first exam.
Students attend one of Dr. Jarvis' industrial engineering classes. In addition to directing the department, Dr. Jarvis has teaching responsibilities. Photo by Mike Mayer.

“...I'm a rambling wreck from Georgia Tech and a hell-of-an Industrial Systems Engineer...” What is an industrial systems engineer anyway? For a generic definition, ISYE (for short), deals with the interactions between technology and management. If an Architect could be described as the engineer of aesthetics and space, it seems appropriate to describe the industrial engineer as the engineer of production and management. Neither is purely scientific, both are highly applicable to people in their working environment, and both are multidisciplinary in nature.

Our American working class culture has evolved almost radically from the early “sweatshops” of the Industrial Revolution. Industrial Engineering was not even heard of, and the technology of the computer was yet on the horizon. The rising of the profession seems to be in accommodation of the industrial age and parallel to that of the computer.

As the computer, through mathematical models and algorithms, interprets the info its fed by its user, the beneficiaries of ISYE's analysis and designs are to maximize optimal conditions in production. The challenge is the uncertainty. Where a computer is either yes or no, people tend to be considerably less predictable. This is where the field delves into the social realm and mathematical models are proved for accuracy.

As the fight song suggests, Georgia Tech boasts of one of the elite ISYE programs in the country, and is acclaimed as the #1 graduate school in the field by U.S. News. The school was established as a forerunner in 1945 under the direction of Frank E. Groseclose. The school is currently under the direction of John J. Jarvis and offers bachelor, master's and doctoral degrees as well as having an adequate research center.
Dr. John Jarvis, Director

Dr. John J. Jarvis currently heads Tech’s ISyE program, acclaimed as the largest in the world. Since 1968, Dr. Jarvis as been at Tech as a professor, advisor, and currently, as Director of the ISyE program. He was officially appointed to this office in 1990 after serving as acting director for two years.

Dr. Jarvis’ interests and contributions as a faculty member are in transportation, distribution/logistics modeling and analysis, and linear programming. Dr. Jarvis teaches courses and advises masters and Ph.D. students in these fields. He has also published research papers and a book titled Linear Programming and Network Plans, as well as a chapter on distribution in the Industrial Engineering Handbook.

Besides his long career at Tech, Dr. Jarvis has had an active consulting career in the transportation and logistics fields. He is principal and a member of the Board of Directors of CAPS Logistics, Inc.; which provides software and consulting services in logistics. Other outside interests include membership in a number of professional societies and playing golf.

Dr. Jarvis’ multivariable professional skills and interests serve Tech well as ISyE Director. Georgia Tech’s $6,000,000 program has 1000 undergraduates, 175 masters, and 125 Ph.D students, making it the largest in the world. Classes are taught by 50 faculty members and 23 support staff. Recently the school was ranked best in the nation by a survey of engineering deans.

Making use of an overhead projector, Dr. Jarvis emphasizes a point. Though the school is industrial and systems engineering, the undergraduate degree awarded is a Bachelor of Industrial Engineering. Photo by Mike Mayer.

Dr. Jarvis explains a concept to one of his students after class. Under his direction, the department regained its status as the top ISyE graduate school in the country. Photo by Mike Mayer.
During the 1992 school year, Dr. Miroslav Marek became the acting director of the School of Materials Science and Engineering after Dr. Steven Autolovich resigned. Dr. Marek remained director as the school searched for someone to fill the position on a permanent basis. As a highly qualified replacement, Dr. Marek enjoyed his new temporary position.

Dr. Marek was born in Czechoslovakia. He attended Czechoslovakia University of Technology at Prague in 1966. After graduation, he worked in the school's applied nuclear physics program. There he researched and developed materials for nuclear reactors. He also taught other students about applied nuclear physics.

In 1970, Dr. Marek came to the United States to complete work on his Ph.D. in Materials at the Georgia Institute of Technology. After receiving his Ph.D., Dr. Marek decided to work for the Georgia Institute of Technology Research Institute (GTRI). He remained there for three years. He continued to work for Georgia Tech in the Metallurgy Program in the School of Ceramic Engineering. Later he went to work for the Georgia Tech School of Materials Science and Engineering.

In addition to working on his new administrative duties during the year, Dr. Marek continued his research and teaching. He worked with eight graduates in new materials research, and he stated that this was where most of his time was being consumed. Also, Dr. Marek traveled to other schools as a representative of Georgia Tech. He met with other materials engineers at these conferences and traded research and ideas with them.
The School of Materials Engineering was formed on March 1, 1985 in response to a survey that concluded that there was potential for growth and advancement in this field. The school was formed when the School of Ceramic Engineering and the Metallurgy Program at Georgia Tech combined to better serve the needs of the job market.

In the studies that lead to the Bachelor of Ceramic Engineering, students prepare for work with ceramic materials, processes, and applications. The continuing and constant development of new materials to use in products such as brick, tile, dinnerware, and high-temperature refractories for furnace linings have formed a good market for Ceramic Engineering graduates.

Georgia Tech's Ceramic Engineers prepare for the challenging world of ceramics through not only their classes but also through groundbreaking research in areas that include thin wall hollow ceramic spheres, high-tech superconductors, directionally solidified entectic composites, and electro-optical materials.

Students who studied metallurgy deal with the relationships between chemical composition, structure, and properties of metals and alloys. This has opened them up to studies in solids, alloy development, and the mechanical, physical, and corrosion behavior of metals and alloys in engineering applications.

The traditional disciplines such as metallurgy and ceramics have been developing into more broadly based materials programs. In these programs students acquire an education emphasizing the fundamentals and the principles of structure-property-processing relationships which is independent of the class of material being studied. There is a growing recognition that the needed discipline is "materials" and most of the leading institutions in the United States have adopted this approach. All engineers have traditionally benefited from an education in materials, and a significant number of specialists in materials have been required to meet the needs of industry in recent years.

Materials can no longer be categorized into the traditional classes of metals, ceramics, and polymers. Examples of composites that are being introduced include airframes, automobile components, and sporting equipment. The technology was based on the development of new materials. Examples include the alloys used in the development of the National Air and Space Administration's (NASA) space plane and better alloys for micro-electronic chips which would make computers run faster and more intelligently.

The purpose of this program is to graduate engineers in the Materials Engineering field at the baccalaureate level who are educated in the fundamentals of the structure-property-processing relationship of materials and who can design, select, manufacture, and test components for most articles of commerce. Graduate degrees are offered in metallurgy, ceramic engineering, and polymers.

In the undergraduate program, students follow a rigorous curriculum in basic science as well as the fundamentals of engineering disciplines. They gain both practical and theoretical insight that will help them throughout their careers.

The Materials Engineering program's goal is to produce graduates who will be prepared to meet new technological challenges in which problems are solved by considering the relative merits of all classes of materials. They are achieving this goal by placing into the minds of the students an invaluable wealth of information to boost them ahead in their careers in Materials Engineering.

A Materials Engineering student uses a computer to assist him in finding the solution to a problem. Classes familiarized students with various software used by materials engineers so that they would be well prepared to compete in the job market. Photo by Charles Clinton.
Mechanical Engineering

Building a Better Tomorrow

by Melissa Stone

When Georgia Tech admitted its first class in 1888, it offered only one degree: a Bachelor of Science in Mechanical Engineering. Mechanical engineering emerged as a new field of engineering during the Industrial Revolution when many labor-saving inventions were being designed and built abroad between 1750 and 1850. The role of the mechanical engineer has expanded as engineers and scientists advanced technology.

The George W. Woodruff School of Mechanical Engineering is one of eight divisions in the College of Engineering and includes many master's and doctoral programs in addition to the undergraduate studies. It is second only to electrical engineering in terms of size. Faculty members are actively engaged in research, and new laboratories and equipment reflect the continuing expansion and growth. Within the school, there are 62 faculty members with about 24 graduate assistants. The co-op program is very strong in the mechanical engineering program; it was the first school to reach 50 percent participation with 153 students taking part during the fall quarter of 1992.

In a modern, technological world, mechanical engineers perform key roles. Eight to ten thousand people found jobs as they entered the profession during the past few years. Many career directions opened for mechanical engineers; they worked in positions in business, government, education, law, medicine, and more. They deal in such diverse industries as power, chemical, automotive, farm equipment, oceanographic, publishing and printing, textile, petroleum, computer, office machinery, mining, pharmaceutical, apparel, rubber, and glass.

Mechanical engineers at Georgia Tech could specialize in one or more areas. Some conducted research to solve new problems, obtain new data, devise new methods of calculation, and gain new knowledge. Others applied research data in the development of new or improved products. Some mechanical engineers concentrated on mechanical design, using practical as well as theoretical knowledge to specify parts and materials for a new device. Mechanical engineers who specialized in manufacturing analyzed methods and equipment to find the most efficient production techniques. A number of mechanical engineers combined their technical knowledge and their human relations skills to move into marketing and sales or to assume positions in management.

Research has always been a key objective in the George W. Woodruff School of Mechanical Engineering. The investigations conducted in the school are characterized by a strong emphasis on experimental work. These projects are funded by external sponsors that included industries and federal and state agencies. There are nine divisions of mechanical engineering research: acoustics and dynamics, automation and mechanical systems, bioengineering, computer-aided engineering, design and manufacturing, energy and power systems, mechanics of materials, thermal sciences, and tribology. Georgia Tech ranked third in the nation for mechanical engineering research and development expenditures, fourth in federally sponsored research and development, and fifth in industry sponsored research and development during the year.
photo by David Pauli.

**Dr. Ward Winer, Director**

Dr. Ward Winer is the director of the School of Mechanical Engineering. Originally from Michigan, he studied at the University of Michigan where he also served as an associate professor of Mechanical Engineering from 1963 to 1969. He then traveled to England and spent two years studying for his postdoctorate at Cambridge University. In 1971 he came to Georgia Tech and was promoted to Professor. He became a Regent's Professor in 1984; an esteemed position since only two professors a year are granted this honor. In 1988 Dr. Winer became the Director of the School of Mechanical Engineering at Georgia Tech.

His main interest is Tribology, the study of friction lubrication and wear, but he is also interested in high pressure lubricant theology. With experience gained from teaching in the thermal sciences, Dr. Winer has advised many students in their Ph.D. studies. He is a member of the American Society of Mechanical Engineers, the American Association for Advancement of Science Society of Tribologists and Lubrication Engineers, and the National Academy of Engineering. He has received numerous awards from professional societies as well as a Tribology Gold Medal for his work in this area.
Textile Engineering

Weaving the Fabric of the Future

by Bay Roberson

Textiles are everywhere, and they affect more than just people's wardrobes. They are used in medicine for artificial kidneys, arteries, and hearts. They are found in space suits, shuttle nose cones, turfs, and fabric roofs for large stadiums. They are also used to protect the environment with landfill liners and in sewage treatment.

The textile complex is the largest manufacturing employer in the United States. It employs over 2.2 million people in more than 5,000 textile-related companies and 20,000 apparel firms in 50 states. The School of Textile and Fiber Engineering prepares students for rewarding careers in plant and design engineering, applied chemistry, manufacturing supervision, technical service, sales, product and process development, research, quality control, and corporate management.

The School of Textile and Fiber Engineering was established in 1899. It now includes 12 professors teaching more than 220 undergraduate and 62 graduate students, 23 of which are working toward their Ph.D.'s.

Georgia Tech's textile engineering program is one of only two such programs approved by the Accreditation Board for Engineering and Technology. The polymer and textile chemistry program is one of the few in the nation with a major component in polymers. Also, the School of Textile and Fiber Engineering is one of only ten programs in the nation to offer a bachelor of science degree in textile technical management. An M.S. and Ph.D. are offered in each of these programs as well as an M.S. in polymers.

Students in the program do not take conventional laboratory classes. Instead, they experience TexTech Enterprises. TexTech is a business venture operated and managed by students. The students experience facets of the textile business from the employees to management. This teaches students the nuances of how to run a successful business.

The School of Textile and Fiber Engineering is steadily becoming a major research arm of the textile industry. The program at Georgia Tech is unique in that it is a part of the College of Engineering; therefore, it places a great emphasis on the scientific aspects of textiles.

Last year, Georgia Tech became part of a National Textile Center including North Carolina State, Clemson, and Auburn. This was a major uplifting of the school's research capabilities. Currently eight projects ranging from recovery and recycling of carpet waste to environmental issues are being studied. The Apparel Manufacturing Technology Center is trying to move the school closer to the apparel engineering sector.

The future of the School of Textile and Fiber Engineering looks bright. It hopes to become the research base for the National Textile Center. The school has set a goal of 300 undergraduate students, 90 graduate students, and 15 professors. Last year, even during the recession, more jobs in textiles were available to graduates than the school could fill.

Textile and Fiber Engineering Faculty


Textile Engineering students work on one of the weaving machines to finish a lab. Students were introduced to many weaving techniques used in manufacturing during their courses of study. Photo by Charles Clinton.
Dr. Fred L. Cook is a distinguished professor who received his education at Georgia Tech. In 1971, Cook received a Bachelor of Science in Textile Chemistry. In 1975, continuing his education, he obtained a minor in Chemical Engineering and also a Ph.D. in Organic/Polymer Chemistry.

Cook has worked at Georgia Tech since 1975. In that time, he has worked his way up from Assistant Professor to Director of the School of Textile and Fiber Engineering. Besides being director, however, Dr. Cook also teaches several classes in his field.

The School of Textile and Fiber Engineering has blossomed under Dr. Cook's leadership. He has helped regenerate the vitality and viability of the program. In 1987, when he became acting director, there were 87 undergraduate and 22 graduate students. Since then, that figure has grown to the present 220 undergraduate and 62 graduate students.

While under Cook's direction, the school has developed into a major research institution. He has helped to form a National Textile Center that includes Georgia Tech, North Carolina State, Clemson, and Auburn. The Center received $8 million in funding last year from the United States Congress. Currently, eight separate research projects are performed in the Center. This has been a major uplifting of the school's researching capabilities. Because of the added funding, Georgia Tech is becoming one of the major research arms in the textile complex.

Dr. Cook foresees a bright future for the textile program at Georgia Tech. He hopes to increase undergraduate enrollment to 300 students, graduate to 90 students, and increase the faculty to 15 professors.

Textile students look on with interest as an instructor demonstrates the use of one of the machines. Hands-on experience keep Tech students in high demand. Photo by Charles Clinton.

Concentrating on their work, students cooperate to complete a project. Projects which required joint cooperation prepared the students for a successful career. Photo by Charles Clinton.
Not everyone at Georgia Tech is a “hell-of-an engineer.” The Ivan Allen College of Management, Policy, and International Affairs offers current and potential students a variety of degree and certificate offerings from any of six schools and departments within the College (none of which would be an engineering degree). Those six schools and departments are: the School of Economics; School of History, Technology, and Society; School of International Affairs; School of Literature, Communication, and Culture; School of Management; and Department of Modern Languages.

The city of Atlanta, GA, an ever-growing international commerce center, is the home of several strong management and business schools including the Ivan Allen College of the Georgia Institute of Technology. Georgia Tech had previously offered degrees in commerce and the management for over 75 years. It was in 1990, however, that the Institute first launched a wider variety of available degrees and certificates under the newly formed Ivan Allen College of Management, Policy, and International Affairs.

The changes and additions to the management school reflect the ideologies of current administration members in maintaining Georgia Tech’s commitment to providing leadership for an ever changing technological world. Although the Ivan Allen College is responsible for the instruction in the humanities and social science departments for all students, its premise lies in the technological foundation of the university. Upon graduation, its students are more likely to find employment dealing with or relating to technological fields than graduates of other local business colleges and universities.

The Ivan Allen College is currently under the direction of newly appointed Dean Robert Hawkins, who took the job during winter quarter of 1993. Dean Hawkins is the successor to Interim Dean Robert E. Cannon, who served in the position until a permanent replacement could be found.
For the School of International Affairs, 1993 was an eventful year. It moved into its new home in the Habersham House on Marietta Street during winter quarter. The school grew to approximately 175 students, with eleven full-time faculty and five jointly appointed professors.

Established in 1990, the School of International Affairs currently offers a Bachelor of Science in International Affairs, and is looking to establish Master of Science and Doctor of Philosophy degrees in the near future. The lower level curriculum is based on core courses in international affairs, economics, languages, history, sociology, quantitative and qualitative analysis, and philosophy.

Upper level courses are separated into three areas of specialization: international political economy, international security policy, and comparative cultures and societies. The school also offers a certificate in International Affairs for students who have completed a 15-hour cluster of approved courses in International Affairs.

In addition to its regular curriculum, the school sponsors a variety of programs and activities. Guests from both the U.S. and foreign governments, such as the former president of Nicaragua, Daniel Ortega, or several former Secretaries of Defense, as well as speakers from the fields of journalism, science, business and education, frequently lecture at the school.

Internships in the Washington, D.C. and local offices of U.S. Senators and Congresspersons, with public foundations, and in private corporations have been organized and are encouraged by the school. Cooperative educational opportunities have also been developed in both the private sector and at U.S. government agencies.

IASO, the International Affairs Student Organization involves the students in a variety of extracurricular activities, and publishes a newsletter, The Globe, to share information about upcoming events, activities, and career opportunities.

Complementing the school’s programs, the Center for International Strategy, Technology, and Policy, based at Georgia Tech, organizes seminars, workshops, and conferences on a variety of topics in the area of international affairs.
Dr. Daniel Papp, Acting Director

Dr. Dan Papp has been a part of Georgia Tech "off and on, for the past 20 years." Papp received his B.A. in International Affairs from Dartmouth in 1969. He began at Tech as an Assistant Professor in the Department of Social Sciences after receiving his Ph.D. in International Affairs from the University of Miami in 1973.

In 1978, Papp became an Associate Professor in the department. Two years later, he rose to Director of the Department of Social Sciences, and later the School of Social Sciences, until 1990. That year, he began serving as Director of the newly founded School of International Affairs.

In addition to the classes that he has taught at Georgia Tech, Papp has published over 100 articles, reports and chapters, as well as ten books. Most of his publications fall into his areas of interest, which include American Foreign and Defense Policy, Russian/CIS Foreign and Defense Policy, International System Change, and the Impact of Communication/Information Technologies on International Affairs. His eleventh book, Contemporary International Relations: Frameworks for Understanding, fourth edition, was recently accepted for publication, and should be in print in 1994. He has also participated in or organized literally hundreds of presentations and symposia over the last 20 years.

Papp will resign as Director of the School of International Affairs effective at the end of this year in order to devote more time to teaching and writing. He will continue as a full professor in the school.
Dr. Robert Green is the undergraduate director of the School of Management. He arrived at Georgia Tech in September of 1957 as assistant professor of management. Originally from Mayfield, KY, Dr. Green has held several positions at Georgia Tech. He was the associate director of the School of Industrial Management from 1966-1969, the associate dean of the College of Management from 1969-1971, the acting Dean of the College of Management from 1971-1972, and he has been the director of the undergraduate management program since 1988. In addition to these positions, he has been a professor teaching Management Theory and Strategic Management.

When asked why he chose to come work at Georgia Tech, Dr. Green stated that he has always been intrigued by Tech. He thought that the opportunities in Atlanta were promising at the time because the city looked like it would be the center of the South and a very booming area. He had lived in Alabama with his wife while in the Navy and preferred being in the South. The School of Industrial Management intrigued Dr. Green. He had seen what had happened at the School of Industrial Management at M.I.T. He wanted to play a part in making the Georgia Tech School of Industrial Management become just as prestigious.

Dr. Green has continued teaching throughout his career because he enjoys it. In describing his job, he stated that it was “delightful.” He loves the chance to deal with what he thinks are the two most important groups on campus—the students first and faculty second.
Management
Preparing for Positions of Leadership

by Adrian Feagin

The School of Management prepares students for careers as managers in the professional field or for additional study of management theory, science, and programming at the graduate level. The school offers two undergraduate programs, the Bachelor of Science in Management and the Bachelor of Science in Management Science. The Bachelor of Science in Management was created for students with broad interests in management and encompasses many areas. The Bachelor of Science in Management Science concentrates on the area of mathematics. With a few exceptions, the core curriculum is the same for both degrees. Each graduate must take classes dealing with laboratory science, humanities, and social sciences. Also required are accounting, economics, information technology, marketing, operations management, finance, and strategic management. The 1993 undergraduate program consisted of 939 undergraduates and 242 graduate students, with a ratio of males to females that decreased from the previous year. Approximately 25 percent of all management undergraduates furthered their education in graduate school.

There has been increasing appreciation for management in society as a distinct and separate profession and occupation. The management program at Georgia Tech has earned respect from businesses and industries, but Dr. Robert Green, Dean of the college, felt that "it is still not as well known as it should be." The reason for the rapid growth and expansion of the management program has been the consistently strong curriculum. It has provided a good foundation for future management, law school, and other advanced studies. Despite the scarcity of resources, Green feels that they have been able to hire some excellent faculty which have helped the program's growth and development. To continue the success, plans have been made for a continuing emphasis on a greater use of the computer in the curriculum and on helping students become more marketable.

There were many areas that made the Georgia Tech management program stand out from other programs. The nature of the curriculum and the work load of the students were major factors. The competition among the students and their quality have helped make Georgia Tech's program one of the best in the world. The quality of the faculty also contributes greatly to the status of Tech's management program. They have involved themselves in many research projects such as finance, the stock market, problems in the work place, strategic management (particularly in the Georgia economy), consumer behavior, effectiveness in advertising and sales promotion, simulation in decision making, international marketing, and entrepreneurship.

A student earning a degree in Management from Georgia Tech has taken an important step towards a successful career. Such a degree has been recognized by many businesses, especially those dealing in technical fields, as a passport to a job because of the high prestige that comes with Tech's management diploma. Graduates may find the education and degree an advantage in the current job market of 1993.
The School of Literature, Communication and Culture (LCC) is anything but “just the English department.” Since 1990, LCC has developed both an undergraduate and a graduate program.

The undergraduate program is called STAC, which is short for Science, Technology and Culture. This Bachelor of Science degree gives the student inquiry into the humanities and sciences, as well as engineering. This follows along with Georgia Tech’s recent move toward new degrees which combine more traditionally liberal arts areas with technical applications.

STAC has attracted a growing number of students who are interested in a self-standing major. Interim School Director Ken Knoespel thinks that the STAC major goes well with Physics, HTS, International Affairs and other majors. Alan Rauch, Assistant Professor in LCC feels, “What STAC offers is an analytical approach to problems in science, technology and culture that is absolutely necessary for students who are graduating into a very sophisticated and diverse society.”

LCC has also been working hard on a Masters of Science in Information Design and Technology (IDAT). This graduate program was approved in October, 1992 and is currently being implemented. It deals with a number of subjects, including hypermedia, networked environments and communication patterns.

Knoespel explains that the Masters program is an applied communication degree, and is open to most anyone. “It’s ideal for someone with a computing background, but we’re hearing from a wide variety of people.”

Literature, Communication, and Culture

Faculty

Ken Knoespel, Interim Director of LCC, is seeing some exciting things happen in his department. In addition to developing undergraduate and Masters programs in STAC and IDAT, LCC is in the planning stage for a future PhD program. Explains Knoespel, “We want to emphasize the rhetoric of science and technology.”

Yet, as Knoespel also admits, “the department has become involved in a lot of other areas.” In October, LCC hosted the 1992 Conference for the Society of Literature and Science. Knoespel and several other members of the LCC faculty hold prominent roles in the brand new journal, Configurations, which deals with Literature, Science and Technology. In the past year, LCC faculty have done everything from participating in international conferences to appearing on CNN.

Knoespel stresses that LCC is not just an English department and is certainly not just a stationary part of Georgia Tech. He concludes, “The department has begun to take a leading role in exploring the significance of a technologically mediated curriculum.”
Dr. William Schaeffer, Director

Dr. William Schaeffer, the acting Director of the School of Economics flew to his position of an economics professor. A native Georgian, he hails from Monticello. He went to Georgia Tech for his undergraduate degree in Industrial Management on a Naval Scholarship.

After Tech, he flew helicopters around the world as a pilot for the United States Marine Corps. In the airflight school he was "a straight B student", but flight made him airsick. After four years of flight around the world, Dr. Schaeffer attended Duke for his Ph.D. He went on a James B. Duke fellowship. Afterwards, he returned to Tech in 1963 where he has taught economics for thirty years. He has also taught at Agnes Scott and Oglethorpe.

Dr. Schaeffer is renowned for his regional "input/output models." He has traveled to Hawaii twice and Nova Scotia three times since the 1960's to set up regional models for those areas.

Professor Schaeffer has also done studies of economic feasibility for the Atlanta Braves and the Montreal Expos. Professor Schaeffer began his study of regions after the Economics department received a grant to teach regional economics.

Dr. Schaeffer sees economics as a way to "give you a world view of things." His interest in economics sprung from the economic survival perspective. Schaeffer enjoys his job as Acting Director of Economics which he was appointed in 1990. Dr. Schaeffer stresses the "the enormous benefit" he's received "from students at Georgia Tech" during his tenure as a professor.
The School of Economics of Georgia Tech was founded three years ago in 1990. In the late 1960s, economics was originally part of the School of Management. During the 1992-1993 school year, the School of Economics included the following professors: Carl Biven, William Belton, Thomas D. Boston, Richard J. Cebula, Ray Chou, Kong Chu, Marilu McCarty, Mack Moore, Ian Novos, Peter Sassone, William Shaeffer, Radwan Shaban, Fred Tarpley, Richard Fritz, and John McLeod. All of these professors are excellent teachers and researchers.

Carl Biven received the position of Professor Emeritus in January 1992. He has been a faculty member for 33 years and concentrates his work on the economic policy of the Carter Administration. Mack Moore was also named Professor Emeritus in January. Moore continues to teach labor and history classes.

According to William Schaeffer, acting Director of the School of Economics, "this is a true economics degree. A Tech degree in economics forces you to look at all aspect of economics." While many other schools are very specialized, the Tech economics program is a general survey covering all economics. The school currently has forty-five students. To receive an economics degree, all students must complete a senior class project, and each student must complete 186 hours.

Many students working in other majors are also in the economics certificate program. For students to receive an economics certificate, they must receive at least a C or better in a minimum of 18 quarter hours of economics classes.

The courses offered in the School of Economics vary from classes such as The History of Economic Thought to Monetary Theory and Policy. The school offers a bachelor in Economics. It also offers courses for Ph.D. programs in management, public policy, international affairs, and even city planning. The school's headquarters are located on 781 Marietta Street at the Habersham Building.
The College of Sciences is composed of six different degree granting schools. These include the Schools of Biology, Physics, Chemistry and Biochemistry, Earth and Atmospheric Sciences, Mathematics, and Psychology. The Department of Health and Performance Sciences is also included in the College of Sciences, but is not a degree granting school.

Tech undergraduates gain experience in problem solving techniques and other basic skills needed for future classes through prerequisite classes in mathematics and natural sciences. These classes are required for the majority of majors. The Health and Performance Sciences classes offer many opportunities to learn about life skills.

Another opportunity, especially at the graduate level, is the availability of advanced classes in interdisciplinary areas. This allows students to combine information from two different departments to learn more about each of them and the interaction between the two. The interdisciplinary programs include biochemistry, biophysics, technology and science policy, applied statistics, microbiology, molecular genetics, and biopsychology.

In addition to the degree programs, the College of Sciences offers many opportunities to broaden the education beyond the degree requirements. With approval students may develop a plan of study to meet their needs and interests. Certificates are available from the School of Earth and Atmospheric Sciences in geochemistry, geophysics, and engineering geology. The School of Physics offers certificates in applied optics, computer based instrumentation, and atomic, molecular, and chemical physics. Many certificates are available from the School of Psychology. These include biopsychology, social/personality psychology, industrial/organizational psychology, engineering psychology, and experimental psychology. In addition to these certificates, high school level teaching certificates are available in physics, mathematics, chemistry, and biology.

With all of the opportunities offered by the College of Sciences, it is easy to tailor a scholastic program to meet the student's needs and interests. This flexibility also makes the educational process at Tech more enjoyable.

In the optics labs, a student pores over his calculations. Physics is one of the six schools in the College of Sciences. Photo by Todd Sleeman.
Robert A. Pierotti has a very distinguished career. He received his undergraduate degree from Pomona College in Pomona, CA. After receiving his bachelor's degree, he went to the University of Washington at Seattle where he earned a Master of Science and later a Ph.D. in physical chemistry. After receiving his doctorate, Dr. Pierotti went to the University of Nevada as a professor. In 1960, he came to Georgia Tech to study gas/solid interactions and the statistical mechanics of fluids. Starting as a professor, Dr. Pierotti steadily progressed through the ranks in the School of Chemistry. In 1982 he became the Director of the School of Chemistry. He remained in this position until 1989 when he became the Dean of the College of Sciences and Liberal Studies.

As the Dean of the College of Sciences, Dr. Pierotti has played a vital role in restructuring the sciences and improving the educational process. In 1991, a program called CEISMC (pronounced seismic) or the Center for Education in Science, Mathematics, and Computers was introduced. This was established to improve and develop introductory courses in sciences, mathematics, and computers. Some results of the program include smaller introductory calculus class sizes and improved teaching methods. The ASSET (Academic Support for Students Entering Tech) program has also been introduced. This calls for faculty support for incoming Tech students (approximately one faculty member for eight new students). This program should help ease the transition from high school to college life. The College of Sciences also makes it possible to obtain a teaching certificate through an arrangement with Georgia State. Look for these and many more improvements to come out of the College of Sciences.

John Ellis performs an optics experiment. All engineering students are required to take the calculus-based physics sequence. Photo by Todd Sleeman.

The study of slides is an important part of biology classes. The School of Biology offers freshman biology classes in addition to upper division classes. Photo by Matt Backer.
Biology
Emphasizing Knowledge on Current Issues

Biologists are scientists whose concern lies in the study of the origin, history, physical characteristics, life processes, and habitats of both plant and animal life. This makes them an important asset in today's ecologically aware climate. Biologists at Georgia Tech and elsewhere are working to solve many problems in highly diverse areas such as AIDS and cancer research, ecological preservation, genetic engineering, and cell immobilization. Biology helps us understand the complex interrelationships that exist between all living organisms. Recent graduates from Georgia Tech have important positions in agencies such as the Center for Disease Control and the Environmental Protection Agency, as well as in academic and industrial laboratories.

The School of Biology is housed in the Cherry-Emerson Building on the corner of Cherry Street and Ferst Drive. The school has ample classroom and laboratory facilities. Laboratories in current biological techniques such as genetic engineering, fermentation technology, immunology, and analytical instrumentation are a few among a growing number. There are also facilities for ecological field studies, and the Marine Institute on Sapelo Island off the Atlantic Coast of Georgia provides additional environmental capabilities.

The undergraduate biology curriculum at Georgia Tech is designed to give students the core requirements and specializations necessary for graduate studies or professional employment. Graduates often find employment in human or animal medicine, dentistry, and health sciences, or with the credentials and lab experience needed for employment as biologists and biotechnologists in government and industrial laboratories.

For interested undergraduate biology students, the School of Biology offers many active research programs which can contribute significantly to the undergraduate's skills and understanding. This emphasis on Undergraduate research is due largely to the fact that potential employers and professional schools demand that students display knowledge of current issues. Practical laboratory experience on a current research topic is an educational experience which helps undergraduate biology students to meet these demands.

The research opportunities are special programs of which students work in collaboration with a faculty member. Most of the research projects conducted by undergraduates culminate in research publication and presentation. Several recent examples of these collaborations include J.S. Hubbard and J.M. Kendrick's "Biodegradation of Petroleum Chemical Extinguisher in Soil Enhances the Degradation of Polyethylene Glycol, 1991," and S.E. Snell's "Rapid Toxicity Assessment of Rotifers I. In Vitro Florescence Biomarkers, 1992."

Unlike most schools at Georgia Tech, the School of Biology is a relatively small school with less than thirty faculty members; however, it is renowned for producing quality undergraduates. Biology's emphasis on laboratory skills and analytical techniques insures that students will be held in high regard. Courses in biology are taught by the faculty and graduate students who assist in laboratory courses and as tutors. Because of the size of the school, students and faculty form close relationships which allow for a much more personalized education. Most faculty readily admit that they know most biology students on a first name basis; these relationships compliment the strong personal independence emphasized by traditional students at Georgia Tech.

Part of every biologist's work involves microscopic observations. The School of Biology emphasized laboratory experience in its classes. Photo by Matt Baclar.
Dr. Roger Wartell, acting director for the School of Biology, has held this position since July 1991. Originally appointed as a joint professor in the College of Physics and Biology in 1974, his extensive background in biophysics led to his current position. Dr. Wartell received his Bachelor of Science in Biology at Stevens Institute in New Jersey. He then went on to the University of Rochester, Rochester, New York, where he received his Doctor of Philosophy in Physics. His thesis work was concerned with the process of DNA binding and to theoretically predict how DNA would unwind given its base pair unit. Further post-doctoral in biochemistry work was done at the University of Wisconsin before coming to Georgia Institute of Technology.

Since his appointment as acting director, Dr. Wartell has developed a three track program for students pursuing a degree in biology related fields. These fields are molecular biology/genetics, environmental biology, and micro-biology/microbial technology. This change has allowed biology students much greater degrees of freedom in choosing fields of specialization.

In addition to restructuring the school, Dr. Wartell has been instrumental in many areas. He has helped in the addition of several new faculty members to keep with the new objectives and coursework offerings. During his administration, the number of biology students at Georgia Tech has increased by fifty percent. Other accomplishments include continual upgrade of computer facilities and research equipment within the school and the addition of courses involving computer modeling of biological processes.

With the general trend of biology going into quantitative analysis, many of the courses have come to stress this facet. Dr. Wartell himself says, "The advantages in coming to Georgia Tech versus other institutions is that you will receive a more rigorous technical background." The requirements for the biology degree at Georgia Tech (such as calculus, physics, etc.) are readily recognized and respected by industry and graduate programs nationally.

Biology Faculty

In Alphabetical Order: Cindy Bohan, Mark Borodovsky, Jung Choi, E. Lloyd Dunn, David Dusenbery, Paul Edmonds, Les Gelbaum, Peggy Girard, Dwight Hall, John Herse, Gunther Holzer, Jerry Hubbard, Terry Snell, Tom Terrabene, Nancy Walls, Roger Wartell, Edward Yeargers
Chemistry and Biochemistry
Unlocking Chemical Secrets

by Robert Lindsay

Founded in 1885 as one of the first four departments at what was then the Georgia School of Technology, the School of Chemistry and Biochemistry continues to prepare engineers and scientists for a better living through chemistry.

Last year, 135 undergraduates and an equal number of graduate students pursued degrees in chemistry. Over the past five years, enrollment in chemistry increased at a rate of about ten percent per year. Many chemists go on to graduate work in law, dentistry, medical, or business. Others go on to research careers or graduate studies in chemistry. The freshman chemistry required for all engineering majors is taught by the school. In addition to these students, the school teaches upper level chemistry classes to biology, chemical engineering, textile chemistry, and environmental engineering majors. A measure of the increased importance of chemistry in other fields is that the number of students taking organic chemistry classes has doubled over the past five years.

Faculty members conduct research in a wide variety of chemistry-related fields. Active areas of interest include work in enzymology and medicinal chemistry with special emphasis on finding treatments for AIDS and cancer. Another thrust area, materials chemistry, involves research in such fields as conducting polymers. To benefit environmental concerns, research in analytical chemistry is also being performed.

Unlike other institutions that offer degrees in chemistry, Georgia Tech provides a distinct advantage. Students benefit from the exposure to other technical fields, such as engineering, that traditional liberal arts schools lack.

Chemistry and Biochemistry Faculty


Using tinted glass to protect her vision, Jennifer Thomas examines the flame to determine the composition of her solution. Different colors corresponded to different chemicals. Photo by Brandon Yee.

Carefully adding drops of a chemical to her test tube, Keshia Thomson conscientiously watches for a reaction. Titration of chemicals was an important skill for freshman chemistry classes. Photo by Brandon Yee.
Dr. Kent Barefield serves as the Director of the School of Chemistry and Biochemistry since the restructuring of 1989. Dr. Barefield graduated with his bachelor's degree from Western Kentucky University in 1965. After receiving his Ph.D. from Ohio State University in 1969, Dr. Barefield did post-graduate research from 1969 to 1970 with DuPont. He then joined the faculty of the University of Illinois at Champaign-Urbana where he taught until 1976, when he came to Tech.

Dr. Barefield's research interests include synthetic inorganic and organometallic chemistry. Specific projects under consideration include the binding of carbon dioxide by transition metal compounds and the chemistry of gas generation in nuclear waste storage tanks. With researchers at GTRI, he is studying the enhancement of carbon composite oxidation resistance.

Shanna Urbanawiz examines the sediment in her test tube after spinning it in a centrifuge. Centrifuges were just one of the many types of laboratory equipment that students learned to use. Photo by Brandon Yee.

Two freshman chemistry students, Keith Woolley and Teresa Ammons, discuss the procedure for a lab. Both CHEM 1101 and 1102 required written reports of the procedure followed. Photo by Brandon Yee.
Dr. Shui-Nee Chow, Director

Director Shui-Nee Chow received his Ph.D. from the University of Maryland in 1970. His early career carried him forward through Michigan State University and Brown University. From 1982 to 1984, he was a visiting professor at the University of Amsterdam and then the National University of Singapore, I.M.A. He came to Georgia Tech in 1988, and in 1989 he became the Director of the School of Mathematics.

Dr. Chow has published more than 80 papers during his professional career. Over the years, invitations have come from around the world for his attendance at different meetings and symposia. These meetings have taken place in such intriguing locals as Sadegna, Italy; Rio, Prague, Peking, Washington, D.C., and Kyoto, Japan. He has published two books, *Methods in Bifurcation Theory* with Jack Hale, and *Dynamics of Infinite Dimensional Systems*, and is working on a third, *Center Manifolds, Normal Forms and Bifurcation of Vector Fields*.

Students study together to gain a better understanding of Calculus. The main goal of the School of Mathematics was to make sure students learned basic math skills needed for their academic programs. Photo by Brandon Yee.

During math class, a student sorts through his textbook looking for an equation. The School of Mathematics strived to instill in students problem solving abilities that would help them in their future endeavors. Photo by Brandon Yee.

The Math Lab is an area where students can seek assistance from tutors or get answers to homework problems. Located in room 157 of the Skiles building, Math Lab was set up to provide help for the students who needed it, and the program became part of Georgia Tech's plans to boost their freshmen retention rate. Photo by Brandon Yee.

Photo by David Pauli.
While making their way through college, most students attend the same introductory courses during their first years. As time passes, emphasis in the course load eventually shifts to those classes specific to the particular degree desired. The knowledge gained from the core curriculum will be vital to their academic endeavors. For many students, mathematics forms an integral part of their studies, not only in the form of algebra or calculus classes, but in those majors where math skills are necessary for completion.

The School of Mathematics offers a wide selection of courses for students of various disciplines including engineering, science, and management. Specialized classes are offered at all levels areas leading to research. These courses include mathematical analysis, differential equations, scientific computing, probability, statistics, and combinatorics.

Undergraduate and graduate degree programs are also offered by the school. These programs, incorporating classroom studies and research opportunities, are widely flexible in order to accommodate the various interests of students in other majors. They are encouraged to develop expertise in other fields relating to mathematics, such as physics, computer science, electrical engineering, and management.

Specialized courses in topics ranging from scientific computing to mathematical physics to optimization, combined with the liberal use of a large computer lab, prepares the potential graduate for the many business opportunities opened with a degree in applied mathematics.

Part of the research program at the school involves the Center for Dynamic Systems and Nonlinear Studies. Much research is devoted to the study of qualitative properties of the solutions of nonlinear differential equations. Students affiliated with the center can receive financial aid, and postgraduate work is also offered.

The School also is involved with joint projects. Working in conjunction with the School of Industrial and Systems Engineering and with the College of Management, the School of Mathematics offers graduate work leading to a degree of Master of Science in Statistics. This program allows students to concentrate their studies in a specific area like engineering, management, or quality control. The course work provides a sound understanding of statistical principles and gives competence in the collection, analysis and interpretation of data. Primarily, this system provides the background necessary for a professional career in statistics.

For many students, the courses offered by the school are only needed for their beginning years. With others, they are merely the start on the long road towards a degree in mathematics. In either case, the School of Mathematics helps provide the skills and knowledge necessary to make it through Georgia Tech and into the world.

A student uses her calculator to solve a difficult math problem. Use of calculators was encouraged by many of the math classes offered at Georgia Tech, and some classes even focused on the functions and uses of particular engineering types. Photo by Brandon Yee.
School of Physics

Building a Solid Foundation

Physics is a primary science, and its fundamentals are far reaching into all degree programs at the Georgia Institute of Technology. An understanding of the phenomena presented in physics is essential as a basis for interdisciplinary research in biophysics, chemistry, applied science, and various fields of engineering as it applies to government, industry, and community applications. As society's level of technology continues to increase, a foundation in physics is not only advantageous, it is a practical requirement for everyone who wishes to understand the universe and how it works.

The School of Physics at the Georgia Institute of Technology, established in 1939, is located in the Howey Physics Building on Atlantic Drive. The faculty is composed of 19 professors, eight assistant professors, and six research scientists.

The school offers classes to all freshmen and sophomores; advanced course work for engineering, mathematics, and science majors; and graduate level course work leading to a bachelors, masters, or doctoral degree in physics. Two undergraduate degrees, the Bachelor of Science in Physics, and the Bachelor of Science in Applied Physics are offered, and these degree programs differ by their intention.

An applied physics degree is generally recommended for students who wish to terminate their academic careers at the level of bachelors or masters. Students who graduate from Georgia Tech with this applied degree generally enter careers in industries concerned with converting basic physics research into a useful technology such as the recent transformation of lasers from the laboratory to commercial use.

The regular physics degree is for students wishing a broader understanding of the fundamentals which will prepare them for pursuit of a doctorate. Students who pursue this avenue of education are advised by Dr. Valk, Director to "Enjoy it! Because you are going to spend an awful lot of time with it."

Several specialized areas of study including acoustics; applied optics; atomic, molecular, and chemical physics; biophysics; computational physics; computer-based instrumentation; and solid state physics are available for students to tailor their degree in areas that interest them. As with most programs at the Institute, the physics degree has the flexibility for students to incorporate several of the program offerings into their degree or create their own individualized study program.

Individuals attending graduate school in this department are offered a wide range of theoretical and experimental fields from which to choose an area of study. In keeping with the current topics in the field of physics, a Center for Non-Linear Dynamics was created. The theory of chaos is widespread throughout the department, especially in optics where both experimental and theoretical studies are being done.

The faculty research program within the School of Physics is on the one of the finest and most respected in the nation. One project currently underway is professor Rajaishi Roy’s study of an area that might be considered the control of chaos. His research consists of studying unstable systems and finding ways to make it stable. The chaotic research has implications in biomedical application, especially as it applies to heart defibrillation. Another current project is the study of materials and how they react. Uzi Landman, an Institute professor, heads the research in this area which studies the behavior of molecules at the interface of two separate materials. This has applications in friction studies, and also to all material sciences.

What most students will remember about the School of Physics is their exposure to the sophomore physics series required by almost all students attending Georgia Tech. These classes are Particle Dynamics, Electromagnetics and Electrostatics, and Optics and Modern Physics. Each of these three classes has an associated weekly laboratory that complements it. Many students find these classes to be difficult and often stumbling blocks during their first few quarters at Georgia Tech. "This is unfortunate," commented Dr. Valk, "but [the classes are] altogether necessary." Later in their collegiate stay, many students are rewarded by the knowledge and experiences that these classes offer as they realize that simplified physical laws and constants are the building blocks of much of the concepts that are covered in their later classes.

Regardless of their chosen field of study, a strong foundation in physics helps students succeed at Georgia Tech, and after graduation, this basic knowledge helps to push them towards success in the business world as well.

Junior Eric Ansaldio finishes his optics lab report after completing an experiment in magnification. Using equipment such as the lasers in the optics laboratory, students gained a better understanding of the elementary laws of physics which would later be implemented in more advanced engineering and science classes. Photo by Todd Sleeman.

Working diligently on his particle dynamics lab report, a student derives the equation for the conservation of energy. A weekly three-hour lab was part of all basic physics classes and required by most schools and departments at Georgia Tech. Photo by Todd Sleeman.
A distinguished physicist, Dr. Valk has a substantial number of degrees. He received his undergraduate degree in physics as well as a Masters of Science in Mathematics at the George Washington University in Washington, D.C. Almost immediately after graduation, Dr. Valk knew that he wanted to pursue a career in theoretical physics. He went to Washington University in St. Louis, MO, where he received his Doctorate in Theoretical Physics.

After his stay in St. Louis, Dr. Valk went on to the University of Oregon as an assistant professor of physics. Before going to the University, he worked for the National Science Foundation. After two years in Oregon, he returned to the NSF as the Program Officer in Theoretical Physics. In 1960, he returned to the world of academia at the University of Nebraska. At the University of Nebraska he worked his way up from assistant professor to full professor and eventually to department head. After four years as the leader of the department, he took a leave of absence in order to go to Germany as a guest lecturer at the University of Frankfurt. Upon returning to the U.S., he was accepted as the Dean of the General College of Sciences at the Georgia Institute of Technology, which at the time was called the College of Sciences and Liberal Studies. After 12 years in administration, Dr. Valk decided to return to his former role as a research scientist. He is now a full professor in the physics department, and when the last Director of Physics, Dr. E.W. Thomas, stepped down, Dr. Valk was chosen as the new Acting Director for the School of Physics.

Besides his new position, he is currently teaching classical mechanics for junior level students at Tech. He enjoys teaching and jokes readily about not teaching the laboratory courses because "it could be hazardous to himself and the students." Dr. Valk is a strong advocate of the necessity for both a mathematics and a physics background. His reasoning is that when mathematical solutions are used to present the theories in the most elegant fashion, they often yield a generality that cannot be postulated by experiment alone: both physics and mathematics are essential to the understanding of physical laws which govern the universe.

Dr. Valk is very optimistic about the future of physics at Georgia Tech and the School of Physics. He looks to the future of physics as a science which will follow a general trend of other fields, concentrating on areas with immediate implications for applied physics. Dr. Valk has pointed out that the structure of Georgia Tech is already poised at this juncture with the increased interactions among departments, schools, and research scientists in both experimental and theoretical research areas. These interactions only serve to strengthen the reputation of Georgia Tech.
The School of Psychology serves a dual purpose for Georgia Tech. It offers training in the basic and applied aspects of the science of behavior for the student majoring in any of the other schools. It also offers programs of study leading to the Bachelor of Science in Applied Psychology, the Master of Science, and the Doctor of Philosophy in Psychology.

The undergraduate curriculum in Psychology stresses fundamentals, providing for broad training in Mathematics, the Natural Sciences, and Management, as well as subjects dealing with Scientific and Applied Psychology. The curriculum provides excellent training for the graduates. The large number of elective courses enables the curriculum to fulfill a wide variety of educational and vocational needs, therefore allowing students to engage in post-graduate study in many varied fields.

The Applied Psychology syllabus at the undergraduate level is unique in the nation. The School offers five programs of study for non-psychology majors, leading to certification in biopsychology, engineering psychology, experimental psychology, industrial psychology, and social personality psychology.

The School of Psychology consisted of 50 undergraduate students and 80 graduate students for the 1992-93 year. The faculty consisted of 19 full-time and two part-time teachers. However, other temporary lecturers were also enlisted for specific programs of study when they were taught at Georgia Tech.

The goals of the program for the academic year 1992-1993 were to implement necessary changes in the undergraduate program, including an undergraduate laboratory for juniors and seniors.

With a look of worry, a psychology student hands her test paper to the professor. Classes offered by the School of Psychology involved complex studies of thinking processes, behavior, and other related topics.

A psychology student checks over her midterm exam. Psychology students found that they had to spend several hours studying in order to make good grades.

Enlightening the class, M. Jackson Marr lectures to his students on the many interesting aspects of psychology. The professors at Georgia Tech helped to create one of the finest Schools of Psychology in the nation.
Doctor Anderson Smith is the director of the School of Psychology. He teaches both undergraduate and graduate courses in cognitive psychology and the psychology of aging.

Dr. Smith received his Bachelor's Degree from Washington and Lee University in Virginia, and he completed his graduate work at the University of Virginia where he received his Ph.D. in 1970. Since that time, he has been at Georgia Tech as an Experimental and a Life-span Developmental Psychologist. He is a fellow of both the American Psychological Association and the Gerontological Society. He has had many editorial experiences including his recent service as Editor for Psychological Services for the Journal of Gerontology.

Citing his work in the psychology of aging, he received the Monie A. Jenet Award for Sustained Research from the Georgia Tech Chapter of Sigma Xi in 1981. Because of his performance as an undergraduate and graduate educator, he received the Georgia Tech Outstanding Teacher Award in 1974. He also served as Georgia Tech Chapter President for Phi Kappa Phi (an academic honorary society) and Sigma Xi (an honorary research society). He completed a term as a national lecturer for Sigma Xi (college of National Lecturers), giving lectures around the country on research dealing with the psychology of aging.

In addition to his position in Georgia Tech, he is an affiliate Scientist at the Yerkes Regional Research Center at Emory University where he has conducted research on memory processes in primates. Lending his expertise to other schools, he is also Adjunct Professor of Psychology at GSU and UGA.

As a public service, he serves as President of St. Anne's Terrace, Inc., a non-profit corporation building retirement residential facilities in the Atlanta area. He has been a consultant with major corporations on aging and cognition, retirement issues, and elderly housing.

Dr. Smith enjoys working with and nurturing the minds of bright, young students and will continue to enrich the psychology program at Tech for as long as the program exists.