Welcome to the Department of Chemistry at the University of Tennessee.

We offer a long-standing tradition of excellence in chemical research and education, from 1947—when the department granted the university’s first Ph.D. degree—to the present, with our more than 30 faculty members whose research interests both cover the traditional areas of chemistry and encompass such new interdisciplinary fields as materials chemistry, chemistry of the life sciences, and environmental chemistry.

The department benefits from a close relationship with scientists at nearby Oak Ridge National Laboratory (ORNL), a multidisciplinary Department of Energy research facility operated jointly by the University of Tennessee and Battelle Memorial Institute. Many of our faculty members collaborate with research groups at Oak Ridge, and several notable ORNL researchers serve as adjunct members of the faculty in the department.

The research and teaching achievements of the UT chemistry faculty have been recognized nationally and internationally. Three faculty members are Fellows of the American Association for the Advancement of Science. The faculty also boasts several winners of the National Science Foundation CAREER award and its predecessor, the National Young Investigator award, and commendation of the faculty for innovative research and teaching has been earned from the Dreyfus Foundation, the Guggenheim Foundation, the American Chemical Society, the American Physical Society, and the Department of Energy.

This brochure and its companion, “Faculty and Research in the Department of Chemistry,” describe our graduate program and the current research interests of our faculty. For more detailed descriptions of faculty research projects, visit the department’s Web site, www.chem.utk.edu, where you can investigate other aspects of our graduate program and apply online. For an even closer look at the department, visit us in person and learn about our program firsthand from the faculty and current graduate students.

We are proud of the Chemistry Department’s tradition of excellence, and we invite you to become a part of it.

“UT engages in outstanding research activities, both in house and in partnership with ORNL. At UT, opportunities for collaborative efforts across the sciences are expanding. Access to the latest technology and computational resources provides an environment conducive to quality research.

“The Chemical Physics program at UT has challenged my experience as a chemist by introducing and reinforcing concepts through a physics perspective and by enriching my research experience. I have found the faculty accessible and engaging, committed to making the time I have invested at UT productive and worthwhile.

“I could not have picked a better school.”
The principal goal of graduate study is to advance the body of knowledge in a chosen field. In chemistry, researchers do bench and/or computational work designed to fill voids in knowledge or to extend understanding and ability. These serious challenges require researchers to have personal commitment, a strong skill set, and access to necessary resources.

An individual researcher depends on many resources, the most important of which is his or her team. Discovery usually requires the efforts of a team composed of faculty members, students, librarians, programmers, craftspeople, and other researchers. At UT, you will become acquainted with such people as you reinforce your knowledge foundation and hone your research skills. When you are ready to select a project, you will also be ready to build or join a team.

**Foundation:** As a new graduate student, your first fundamental resources will be your faculty guides and the advanced course work that will increase the breadth and depth of your knowledge. We offer a core curriculum in the traditional sub-disciplines of analytical, inorganic, organic, physical, and polymer chemistry to help you build a working knowledge base and develop scientific judgment. Toward those ends, we evaluate students’ learning with cumulative examinations that call upon critical thinking skills, and we supplement the fundamentals with special-topics courses and a vigorous seminar program that brings prominent scientists to campus to discuss current developments in chemical research.

**“Hard” Resources:** Within the buildings occupied by the Chemistry Department are the mechanical, electronics, and glassblowing shops. Well-qualified craftspeople and technicians produce or modify the tools and equipment required for highly specialized tasks. The shops also provide routine maintenance for a number of commercial off-the-shelf products, as well as for our local computer network.

Our comprehensive spectroscopic facilities include NMR and mass-spectrometry laboratories managed by research professors. Each lab houses an array of instrument capabilities. Other spectroscopic instrumentation includes ESR, FTIR, X-ray photoelectron, and Raman capabilities. A wide variety of laser sources is also available.

State-of-the-art instrumentation for separations is used in gas and liquid chromatography, GC-MS, and capillary electrophoresis experiments. X-ray diffraction and ESCA are other available characterization tools. (Many of these instruments are managed by graduate students with special instrument operator appointments.) World-class user facilities are also available at nearby Oak Ridge National Laboratory.

**“Soft” Resources:** Among the richest resources available to UT’s chemistry researchers is our network of collaborative relationships with research organizations around the world. Oak Ridge National Laboratory is only 35 miles from Knoxville, so collaborations with top-flight ORNL scientists are common, and UT Memorial Research Hospital is within biking distance from the Chemistry Department.

Because the state of Tennessee is interested in keeping East Tennessee a vital center of inquiry and discovery, it funds the Science Alliance—a “center of excellence” designed to maximize the research resources of the university and ORNL. The Science Alliance facilitates cooperation among research groups, provides stipends and research awards, offers summer research programs for new graduate students, and opens
access to sophisticated instrumentation. Consequently, the area draws postdoctoral researchers and visiting scientists from around the world, which helps create and maintain a broad-based international atmosphere of investigation.

As for information resources, the university’s library system stands out for its excellent chemistry collection housed in the main library building. In addition, the system maintains a reading room within the chemistry complex that contains the most often used reference works. The library also supports a number of valuable electronic resources, which are available to graduate students.

The chemistry complex features a departmental local area network that provides ready access to computing resources, including high-speed and parallel computers at UT and ORNL and resources at national and international computing centers.
The Graduate School Experience

As an undergraduate, you took introductory surveys of chemistry, physics, biology, and mathematics and sampled the ideas that define modern chemistry. Perhaps you even formed some ideas of what life as a professional chemist might be.

As a graduate student, you will have a chance to test your preconceptions. The path you are on leads to becoming a leader in the classroom and laboratory, to becoming a professional scientist. At UT, you will learn specifics:

- how to select interesting, significant problems,
- how to design a research plan to answer the questions you’ve posed, and
- how to carry out the research and analyze the data to produce a credible solution to the problem.

In graduate school you will participate actively in the search for new knowledge and understanding. The next few years may be the most exciting period of your professional life; they will prepare you for a lifetime in pursuit of knowledge.

As you evolve gradually toward the status of professional chemist, you’ll take chemistry course work, but at an advanced level. By the end of the first year, your progress will include teaching experience, probably in a general chemistry laboratory and recitation. You will have participated in seminars led by eminent scientists from around the world. You will read the chemistry literature with a more critical eye. You will be surrounded by peers and mentors with similar interest in and devotion to the process of research. You will have chosen a research advisor, and you will have done preliminary work in your chosen research area. And maybe most significant to you, you will likely receive a stipend for an assistantship that will cover your tuition and fees and allow you a reasonable standard of living.

Lewis Thomas, renowned biochemist, physician, university administrator, and celebrated nature author once wrote, “If there is any single attribute of human beings, apart from language, that distinguishes them from all other creatures on earth, it is their insatiable, uncontrollable drive to learn things and then to exchange the information with others of the species.” At a research university such as the University of Tennessee, you can act on both facets of that drive as you pursue knowledge and learn to communicate it to various audiences.

If it is true that a number of graduate schools offer a valuable experience, you may be asking Why UT? We hope that this booklet, supplemented with details from our Web site, will answer that question persuasively. Please read on to learn more about our graduate program, our current students and recent graduates, our faculty, our support staff, our facilities, our university, and our city.

Follow the links from our Web site to

- explore details of the research interests of our faculty;
- examine synopses of our graduate courses;
- tour our laboratories and shops; and
- get a sense of the excitement students feel when they come to UT.

Let us tell you about the awards won by our faculty for their excellence as teachers and researchers. Learn about the successful careers our graduate alumni have built. Look at the generous financial rewards for graduate students who have
distinguished themselves as teachers, scholars, and researchers. Compare the stipends available for incoming students—and bonus offers made to the most outstanding applicants—with those of other programs in locales with higher living costs. Then read about life in the beautiful foothills of the Smoky Mountains: Knoxville’s cultural attractions, its moderate climate, and its high quality of life at relatively low cost. (There are housing options available to meet whatever needs you may have.)

If you need more information, we are eager to help. Contact us by phone or e-mail, and if you can, please visit us in person. This brochure has a small map to help you locate the campus in the Knoxville area, but if you need more detailed information or directions, we will be happy to provide them.

If you are ready to apply to the program, fill out the application form included with this brochure or apply online at our Web site. We welcome the chance to communicate with you. Contact information for everyone in the department—from the head to the support staff—is available on the Web, so if you have any questions about academics, research projects, or operations, please ask.

“Chemistry at UT has several core areas of strength: analytical, organic, inorganic, physical, polymer, and synthesis. The core competency of the department is deep in several different areas, thus giving some freedom of choice. There is not just one faculty member doing something you are interested in; there is an entire group in each area of research. If one researcher is not doing exactly what you want, you have several others to choose from.

“That is one aspect of the ‘UT superlative.’ The other is the amount of excellent instrumentation available to the department. There are collaborative agreements between the university and Oak Ridge, through which we can supplement the equipment on campus. Anything that’s not in Knoxville is close by at Oak Ridge National Laboratory.”
Career Foundations

Since you are reading this booklet, (1) you have probably narrowed the scope of your career options to those accessible via advanced study of chemistry, and (2) you regard your choice of a graduate program to be the first big step along that career path.

We at the University of Tennessee agree with you, so we do our best to help you lay the strongest possible foundation for a rewarding career as a professional chemist. We concentrate our efforts in the following areas.

Problem-solving mindset, technical skills, and professional attitudes/ethics

Beginning with your first course work and laboratory efforts, your teachers will have designed their instruction to target these fundamentals as they teach chemistry content. Without these assets, good research is impossible. A number of research appointments and assignments are available in the department, all of which can also help you develop these skills.

Communication skills

1. Technical (peer-to-peer, expert audiences). A professional chemist must be able to inform others in the profession about his/her work, generate ideas for significant research, and develop mutually rewarding collegial relationships. Attending scientific meetings is a good way of learning how real-world professionals do this, so the Chemistry Department encourages—and financially supports—graduate students’ attendance at regional and national conferences.

To provide practice for such meetings, we require graduate students to present one seminar within the department in which they share their contributions to the research enterprise of the department and gain feedback on presenting themselves professionally. Many divisions within the department hold informal brown-bag seminars at which faculty members and students discuss their research and recent articles from the chemical literature.

2. Instructional (non-expert audiences). Clear communication with non-expert audiences is essential whenever the public requires an explanation of observations or events related to the subject of chemistry. Such communication is also crucial to helping undergraduates to learn chemistry basics. Graduate students help carry out our teaching mission in discussion sections, in the department’s tutorial center, and in teaching labs. In these venues, graduate students can deepen their own understanding of concepts and sharpen their communication skills with non-experts as they serve in the many teaching appointments and assignments available in the department.

Riyam Kafri

B.S. (chemistry), Earlham College
Pursuing a Ph.D. in organic chemistry

“In the U.S., women in science are a minority. In my culture, women in science are a rarity, which is why I chose to become a scientist. The Department of Chemistry at UT provides me with an atmosphere rich in intellectual stimuli and great fellowship. Interdisciplinary work is at the cutting edge of science right now, and networking with colleagues is the way to find answers to questions. Our student body truly portrays how science bridges cultural lines. Our department provides us with wonderful opportunities through its exceptional faculty, facilities, and staff.

“In my group we use molecular modeling to design and synthesize biologically active compounds. The chances to learn are infinite; we have the chance to be independent and creative. My advisor is a great scientist who continues to inspire and motivate me every day. He is approachable and available at any time. We have a well-equipped lab. We also have access to all other departmental facilities, such as NMR and GC-MS.”
Practice in communicating with other lay audiences is available through student organizations. The university has active chapters of the Association of Chemistry Graduate Students (ACGS) and the Younger Chemists Committee (YCC). Besides the usual fundraising activities, special seminars on such topics as résumé writing and job hunting, and social events scheduled throughout the year, ACGS is also active locally in public outreach. Outreach activities include a summer chemistry camp for elementary school students, workshops for area teachers, and demonstration visits to local grade schools.

Networking
Another benefit of the department’s strategy for teaching professional communication is the chance for graduate students to hone their networking skills at regional and national scientific meetings. Participation in student organizations (ACGS and YCC) also allows students to network with peers at other institutions.

Building in incentive
To reinforce the values and skills that produce top-quality professionals, we reward our graduate students who achieve excellence in research, teaching, and academics. The most tangible rewards are distributed at the annual Honors Day ceremonies near the end of the spring term. Generous alumni, friends of the department, and industrial sponsors have established endowments that provide resources to help us honor excellence with cash awards.

Research by Departmental Division

**Analytical Chemistry**

The research of the Analytical Chemistry Division spans the key areas of analytical chemistry: mass spectrometry, separations, spectroscopy, sensors, and nanotechnology. The results are applied to problem-solving in such arenas as process industrial chemistry, biology, and environmental science. In addition to the core faculty in the analytical division, other chemistry faculty members and adjuncts from Oak Ridge National Laboratory are directing research projects in this division.

**Inorganic Chemistry**

The students and faculty of the Inorganic Chemistry Division at UT undertake research in areas ranging from fluorine chemistry to microelectronic and nanostructured materials to organometallic synthesis to lanthanide chemistry. Almost every branch of inorganic chemistry is strongly represented.

Links to nearby Oak Ridge National Laboratory provide additional capability, and several faculty members conduct their research at ORNL. ORNL–linked research includes materials and solid-state chemistry, physical inorganic chemistry and radiochemistry, separations science, transuranic element chemistry, and nuclear medicine.

A sound practical and intellectual grounding is ensured by our students’ access to the resources of such other external facilities as the Advanced Photon Source, the National Synchrotron Light Source, and the Intense Pulsed Neutron Source, coupled with powerful instrumentation available within the department.

**Organic Chemistry**

Among the diverse research projects in the Organic Chemistry Division are traditional synthesis programs involving natural products, complemented by efforts to develop new synthetic pathways to healthcare agents for both therapy and diagnosis. The synthesis groups also aim to develop and apply new methodologies, including environmentally friendly reaction procedures.

Our physical organic chemistry research includes traditional reaction-mechanism studies, gas- and solution-phase thermochemistry, aromatic photochemistry in matrices, and the structure and dynamics of micelles. Supported by a complete suite of up-to-the-minute analytical and spectroscopic instrumentation, the organic faculty and its research groups co-investigate topics with colleagues both inside and outside the department, with the university’s centers of excellence in biotechnology and structural biology, and with research groups at several national laboratories, particularly those at nearby Oak Ridge National Laboratory.

“I came to UT specifically for polymer chemistry. Tennessee is one of the few schools in the country where you can explore polymers under the umbrella of chemistry. There are many polymer science departments that blend chemistry and engineering, and they have their benefit. But as a chemist from a chemical background, I wanted the polymers in the chemistry. Some of the professors here are world-renowned.

“UT has a lot to offer. It’s a wonderful place to get a good balanced education and a lot of practical experience early on.”

Marc Strand
Ph.D. (1986)
Principal Research Chemist
Eastman Chemical Company
Physical Chemistry

The Physical Chemistry Division conducts experimental and theoretical research in a wide range of areas:

• Spectroscopic investigations of nanoscale and magnetic materials
• Physical mechanisms for the production of chirality
• X-ray and neutron spectroscopy of surfaces and materials
• Reaction dynamics and quantum chemistry
• Optical and electron spectroscopy of gas-phase and condensed-phase systems
• Thermodynamics, computer simulation, and interfacial control of polymers
• Film growth and surface chemistry

Polymer Chemistry

Polymer chemistry research at UT comprises a range from synthesis of novel polymer structures to the study of their physics and properties. Examples of specific areas of interest:

• Anionic polymerization
• Thermodynamics and properties of polymer solutions, blends, and nanocomposites
• Synthesis of linear and branched polymers and copolymers of controlled structure
• Polymer brushes
• Modification of polymer interfaces

Synthesis

Construction of specific molecules on demand is an important challenge to modern chemistry. Taking up this challenge are the synthesis groups at UT, whose goals include the elaboration of natural products, catalysts, polymers, and pharmaceuticals.

The design and construction of useful, unique molecules often requires developing new synthesis methods, applying state-of-the-art spectroscopic techniques, and exploiting sophisticated computational methods. A synthesis student must therefore be ready to discover new products and use cutting-edge tools and techniques.

Giving top priority to the biomedical, materials, and environmental areas, synthesis research groups at UT have

• discovered new reactions,
• synthesized compounds active against HIV,
• developed a therapeutic agent used to destroy tumors,
• prepared novel bifunctional polymer reagents, and
• designed and synthesized new silicate-based sorbents exhibiting enhanced ion recognition for the removal of toxic metal ions from aqueous waste streams.

J. Kevin Rice

B.S. (chemistry; minors in mathematics and physics), Guilford College
Pursuing a Ph.D. in polymer chemistry

“My experience here at the University of Tennessee, and in Knoxville as a whole, has been a great one.

“I have had the opportunity to work within a research group constantly undertaking new and exciting projects. The Department of Chemistry seems, in general, to be growing in leaps and bounds, not only in numbers of incoming students but also in additions of new, enthusiastic faculty members, as well as a constantly expanding suite of advanced instrumentation.

“The close collaboration of many of the researchers here with scientists at Oak Ridge National Laboratory, which is just a few miles down the road, only adds to the ability of the department to remain at the cutting edge of many frontiers in chemistry. With this mix of experienced veteran faculty, fresh new faces, and the latest instrumentation, the University of Tennessee Department of Chemistry is fully prepared to take chemistry, as well as its students, boldly into the 21st century.”
“Certainly the students exiting the programs today have maintained the academic excellence of the university. In addition to that, I think the idea of interdisciplinary education has helped students recognize that problem-solving is not single-faceted.”

“Another thing I see with our students is the ability to interact with people. We have come to understand that to be able to get along in the world, you need to be intelligent, you certainly need to be able to solve problems, but you also need to be able to communicate. Being able to lead a team or being a team member is extremely important. I think the department has taken the lead in understanding this and in allowing our students to be focused not only on their academic side but on their people skills, as well.”

Cross-Disciplinary Focus

Environmental Chemistry

A number of initiatives launched by research groups at UT apply chemistry to problems facing the environment, especially to the complex challenge of restoring the health of the environment by removing toxic substances while preventing the introduction of other pollutants. Current examples of such projects:

- Synthesizing a new polymer now being used to remove radionuclide contaminants in groundwater
- Developing new methods for analyzing biological markers of exposure to toxins
- Collaborating with the Center for Environmental Biotechnology on using capillary electrophoresis to study the genetic complexity of biological samples
- Understanding the photochemistry of polycyclic aromatic compounds in water
- Developing supercritical carbon dioxide as a solvent for certain reactions, thus eliminating the need for ozone-depleting fluorinated solvents
- Using process mass spectrometry to analyze industrial processes continuously in real time
- Developing sol-gel materials as metal ion complexants for environmental remediation
- Performing computational studies of chemical reactions in planetary atmospheres

Chemistry in the Life Sciences

The interface between chemistry and biology will continue to be a dynamic frontier of significant scientific discovery well into the future. Chemistry is the key science in many problems central to biochemistry or molecular biology because good science in these areas requires molecular-level understanding of the systems under study. A scientist who can use the tools of chemistry to analyze and manipulate biological processes has an advantage, both at the lab bench and at the computer. In particular, organic synthesis and analytical chemistry have attracted several members of the UT faculty.

Organic Synthesis Projects

- Design and synthesis of antiviral and anti-cancer compounds
- Synthesis of natural products that have potential use as cancer treatments
- Development of physiologically active agents containing NMR-active nuclei for use in magnetic resonance imaging
- Production of nanostructures, such as endohedral fullerenes, for medical applications
- Isolation and identification of biologically active natural products from snake venom
- Development of solid-phase combinatorial synthetic methods

Analytical Chemistry Projects

- Development of separation methods (HPLC and CE) for the analysis and purification (by preparative HPLC) of biologically important compounds
- Automation of microcolumn online enzyme-, immuno-, and bioassays
- Design at the molecular level of electrochemical sensors for DNA molecules containing specific nucleotide sequences
- Application of electrospray mass spectroscopy to biological systems

Another fundamental project in this area is a study of the origin of chirality in the universe.

UT scientists maintain collaborative links with researchers in industry and in other laboratories in the region. Some of these partners are the university’s Biochemistry and Cellular and Molecular Biology Division, the Biotechnology Center in the College of Agricultural Sciences and Natural Resources, the Center for Environmental Biotechnology, the UT Medical Center, and the Life Sciences Division at Oak Ridge National Laboratory.

Materials Chemistry

It is difficult to overestimate the influence of materials technology on human culture. We even identify periods in our prehistory—the Stone Age, the Iron Age, the Bronze Age—by the names of the most commonly available or the newest materials. Today we have the ability to craft materials that have never before existed.
The variety of research being conducted here in the department is one of the most attractive factors to many students who are pursuing a graduate degree. My research group focuses on the optical activity of various compounds (both organic and inorganic) that are inherently achiral and on the study of the various factors that influence their optical rotations. Coming to the University of Tennessee to conduct my research is a choice I would repeat.

Members of the UT chemistry faculty are at the forefront of modern research, studying materials at their most fundamental levels—atoms, molecules, crystals, and noncrystalline arrays. Their research covers the four elements of materials science—properties, structure/composition, synthesis/processing, and performance—and how these interrelate. Our graduate students are in an excellent environment for cutting-edge research since we collaborate closely with other materials research programs, both within the university and at Oak Ridge National Laboratory. ORNL's state-of-the-art resources coupled with our own internal assets afford our students opportunities that are hard to equal. These are examples of materials research done by groups at UT:

- Studies of nanostructured surfaces that could serve as future catalysts
- Investigations of polymers and polymer blends and their applications, for example in removing toxic metals and creating liquid crystalline displays
- Productive studies in the physical and theoretical chemistry of polymer phases, solutions and blends, as well as in the kinetics of polymer formation
- Studies of such inorganic materials as functionalized sol-gels, ceramics, and zeolites, as well as their applications to environmental, sensor, electronic, and superconducting problems
- Novel approaches to preparing fullerenes, nanotubes, diamond films, and electrically conducting organic salts
- Studies of structure and dynamics of organized assemblies such as micelles using a variety of physical techniques, including small-angle neutron scattering
- Development of analytical probes based on mass spectrometry to monitor polymerization processes

Theoretical & Computational Chemistry

The increasing availability of inexpensive high-speed computers has produced a revolution in computational chemistry. Problems that were thought to be out of reach just a few years ago can now be solved on a desktop computer. Members of the chemistry faculty at UT are using the computer to investigate significant research problems ranging from fundamental studies of chemical reactions to simulations of polymer systems that could be important to industry. Others in the theoretical chemistry group continue to work on the formal theory that underlies all computational methods and on simple model systems that give insight into physical reality.

The major themes in theoretical chemistry at UT are quantum chemistry, chemical dynamics, statistical mechanics of polymers and liquids, and the theory of chromatographic processes. Some of the things we do:

- We use both Monte Carlo and molecular dynamics methods to simulate complex physical systems, especially polymers and cryogenic fluids and solids.
- Our studies have helped refine the theory of non-linear chromatography.
- Quantum mechanical studies have investigated the theory of photoionization, the dynamics of chemical reactions in the atmosphere and in interstellar space, and studies of molecules adsorbed at surfaces.
- Formal theory and simple model calculations have been used to investigate the structure and properties of amorphous solids, rubber elasticity, and the origin of hydrodynamic boundary conditions.

Neutron Sciences

Thermal and cold neutrons are such useful probes for investigating the structure and dynamics of materials because (1) their wavelengths are comparable to interatomic distances, and (2) neutrons are scattered quite differently by the different isotopes of an element. Also, the uncharged neutrons penetrate bulk materials to centimeter depths, making it possible to study such bulk phenomena as residual stresses in metals or polymer chain conformations during processing in situ.

Neutrons can probe such soft materials as polymers, colloids, composites, and biomacromolecular assemblies (for example, viruses and protein–nucleic acid complexes). Hard-materials candidates are metals and alloys, ceramics, opto-electronic materials, and inorganic and metallic nanoparticles and catalysts. Members of our faculty have ongoing nuclear-scattering research on both soft materials (polymers and colloidal complex fluids containing...
surfactant micelles, liquid crystals, and microemulsions) and hard materials (zeolites, functionalized sol-gels, and inorganic nanoparticles).

Our close collaboration with nearby Oak Ridge National Laboratory allows joint and adjunct faculty members to use the facilities of both institutions to perform neutron-scattering research. In fact, the ORNL connection will soon make the UT Chemistry Department the best available for such research by virtue of unmatched access to facilities. ORNL now features the upgraded High Flux Isotope Reactor, which provides some of the world’s best cold neutron beams and serves as a highly competitive reactor source for small-angle neutron scattering, magnetic studies, and crystallography. Currently under construction at ORNL is the world’s most powerful accelerator-based pulsed neutron source, the $1.3-billion Spallation Neutron Source, expected to be on line in 2006.

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**Life in Knoxville**

### QUICK LOOK

- Knoxville: 173,890
- Knox County: 382,032
- Metro: 687,249
8.9% of East Tennessee’s population is of minority backgrounds

**Weather**
- Annual Average Temperature: 58°F
- Annual Average Rainfall: 47.17 inches
- Annual Average Snowfall: 11.40 inches

**Cost of Living**
Data from the American Chamber of Commerce Researchers Association shows that Knoxville’s cost of living is lower than that of these U.S. college cities: Atlanta, Baton Rouge, Bloomington (Indiana), Cincinnati, Columbus (Ohio), Columbia (South Carolina), Champaign (Illinois), Gainesville (Florida), Lexington (Kentucky), and Chapel Hill and Raleigh, both in North Carolina.

**Location & Climate.** Knoxville is a medium-sized city located in scenic surroundings in the broad Tennessee River Valley between the Cumberland Mountains to the northwest and the Great Smoky Mountains to the southeast. These two mountain ranges help create a moderate climate, with an annual average temperature of 58 degrees. Downtown Knoxville is 936 feet above sea level.

### DETAILS

**Livability.** The Knoxville area has been cited in national surveys for its high quality of life. It is large enough to have the educational and cultural advantages of a city without the typical stresses of a more densely populated urban area. Affordable housing, healthcare costs below the national average, a low crime rate, and a pleasant climate with rivers, lakes, and mountains nearby are factors that make Knoxville an attractive place to call home.

**Taxes.** There are no state or local personal income taxes in Tennessee.

**Employment.** Snapshot of non-farm employment for 2000:
- Services .................. 28.5%
- Trade ....................... 26.9%
- Government ................ 16.3%
- Manufacturing, total .... 14.1%
- Construction .............. 5.2%
- Transportation, Communications, Public Utilities .................. 4.6%
- Finance, Insurance, Real Estate .......... 4.5%

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“After leaving UT in 1966, I became part of the analytical chemistry organization in Oak Ridge, and most of my coordination with the department has been through our professional society, the local chapter of the American Chemical Society.

“In the early ‘80s the needs in Oak Ridge were growing, and I started recruiting UT students to Oak Ridge at that time. I have been very impressed with the graduate students from Tennessee. They are very knowledgeable, have very good training, and have contributed to our programs in a major way.

“The faculty at UT is very caring. They take time to mentor and are willing to be flexible. And they have listened to suggestions made by the Industrial Board of Visitors. For example, they have seen the need for training not only in industrial chemistry but in ethics.”
Logistics. Three interstate highways intersect in Knoxville, and one-third of the U.S. population is within 500 miles of Knoxville via the interstate system. The city is directly linked to the Great Lakes by the Interconnected Inland Water System and to the Gulf of Mexico by the Tennessee-Tombigbee Waterway. The public bus system operates 70 vehicles, and a free trolley system serves the downtown and university areas.

Student Housing. Housing is easily affordable in Knoxville. Many graduate students opt to live in the inexpensive and comfortable apartment complexes operated by the university. Others live in renovated Victorian houses-turned-apartments in the historic Fort Sanders neighborhood, just a short walk from the chemistry complex.

Recreation. Knoxville and Knox County have 5,596 acres of park and recreation space, including 27 recreation centers, 144 playgrounds and parks, 103 tennis courts, 20 public golf courses, and 14 greenways and walking trails. Two big attractions for all ages are the Knoxville Zoological Gardens and Ijams Nature Center.

The Knoxville Ice Bears bring professional hockey to the Coliseum October through March. Our local professional baseball team is the Tennessee Smokies, a class AA affiliate of the Arizona Diamondbacks. Nationally competitive sports teams at the university draw thousands of enthusiasts to games each year.

Special seasonal events include the Dogwood Arts Festival and the Expo 10K race in the spring. Summer brings music at Hot Summer Nights and Festival on the Fourth, which also features a fireworks display. Boomsday—a monster of a fireworks show—and the Artists’ Extravaganza mark the fall, and Christmas in the City in makes December a lovely time to be in Knoxville.

The nearby Great Smoky Mountains National Park is the country’s most visited national park. Visitors are drawn by the beauty of the mountain landscape, the hiking trails, and the swimming, boating, kayaking, and fishing that can be found there and at a number of other state parks, lakes, and resorts that dot the area.

Arts & Culture. Knoxville is perhaps best known for a vibrant music scene that showcases all kinds of music, especially jazz. Tours of most major entertainers make Knoxville a stop, and the clubs around town feature the hottest young up-and-comers.

The community supports the Knoxville Symphony, the Knoxville Opera Company, and the Tennessee Children’s Dance Ensemble, among other exceptional arts organizations. Additional dance companies, civic choral groups, and nine theaters also help celebrate the arts.

The Knoxville Museum of Art features changing exhibits throughout the year, and the McClung Museum, an anthropological museum on the university campus, offers both permanent and touring exhibits of highly interesting and unusual collections. Many libraries, historic sites dating back to prehistory, and special-focus museums—such as the Museum of Appalachia that preserves folkways of the region’s earliest immigrants—add to the cultural richness of the Knoxville area.

Maggie Connatser
B.S. (chemistry), B.A. (history); Furman University
Pursuing a Ph.D. in analytical chemistry

Award:
National Science Foundation Pre-Doctoral Fellowship

“I had no idea how much I would enjoy graduate school at the University of Tennessee—the richness of the scientific dialogue here has inspired me more than I could have projected. All my professors willingly engage in conversation about my research. My advisor uses every chance to further both my science education and my professional opportunities. The professors inform their students in the subdisciplines of chemistry, covering both advanced theory and cutting-edge science. Collaboration further strengthens the scientific merit of the research and learning experience here at UT. The environment for scientific growth here is so rich, and my advisor so supportive, I have accomplished goals I never realized were possible.

“The beauty of this region serves as a constant reminder of why I chose science as a profession. The majesty of nature gracefully coincides with the advantages of modern technology to offer a panoply of options for relaxation.”

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