Department of Chemistry
Faculty Expertise/Research

NAME	EMAIL/PHONE/URL	RESEARCH AREA
Boles, Jeffrey, Ph.D. ***Professor and Chair***	jboles@tntech.edu 931-372-3416	Analytical Biochemistry (Protein Purification, Electrophoresis, Mass Spectrometry), Proteomics (including Environmental Proteomics), Forensics of Clandestine Drugs (Chemical Fingerprinting using LC/MS/MS), Protein Chemistry (Reaction Kinetics, Covalent Modification) and Structural Biochemistry (incorporation of unnatural selenium and tellurium containing amino acids into proteins).
Callender, Andrew, Ph.D. ***Assistant Professor***	acallender@tntech.edu 931-372-6273	Analytical chemistry and spectroscopy; applications of dispersive liquid-liquid microextraction techniques for chromatography and spectroscopy; statistics and data science for interpretation of analytical data; low-cost analytical instrumentation for the developing world.
Carrick, Ann Marie ***Instructor***	acarrick@tntech.edu 931-372-3426	Chemical education
Carrick, Jesse, Ph.D. ***Associate Professor***	jcarrick@tntech.edu 931-372-6199	Heterocycles, Medicinal Chemistry, Natural Product Total Synthesis
Carroll, Amanda, Ph.D. ***Lecturer***	acarroll@tntech.edu 931-372-6324	Chemical education (teaching, learning, and mentoring strategies), Analytical/Inorganic Environmental Chemistry (utilizing chelating resins to remove metals from aqueous sources)
Carroll, William, Ph.D. ***Assistant Professor***	wcarroll@tntech.edu 931-372-6094	NMR spectroscopy, Residual Dipolar Couplings, and physical organic chemistry
Cashman, Derek, Ph.D. ***Lecturer***	dcashman@tntech.edu 931-372-3434 http://www.cae.tntech.edu/~dcashman/	Biochemistry, Medicinal Chemistry, Computational Modeling
Cojocaru, Andreea, Ph.D. ***Instructor***	ocojocaru@tntech.edu 931 372-6399	(a) Applying the ionic liquids strategy to bio-renewable materials and utilizing the new materials for pharmaceutical and environmental applications (b) Synthesis, development, and study of active pharmaceutical ingredients in liquid form (c) Development of new delivery systems for active pharmaceutical ingredients in liquid form.
Coonce, Janet ***Instructor***	jcoonce@tntech.edu 931-372-6521	Chemical Education: Research and design of tutorials, games, and animations for introductory Chemistry students
Crouse, David, Ph.D. ***Associate Professor***	dcrouse@tntech.edu 931-372-3515	Organic Chemistry, Polymer Chemistry
Wilson Gichuhi, Ph.D. ***Assistant Professor***	wgichuhi@tntech.edu 931-372-3499	**Atmospheric Chemistry and Environmental Spectroscopy:** The main research goal of my research group to apply infrared spectroscopic techniques in environmental and atmospheric detection of trace gases. Our measurements assist in gaining insights onto fundamental photophysical and photochemical processes, as well as the fate of reactive and non-reactive trace gases in urban and sub-urban environments. In the first project, we utilize a high-precision continuous wave Cavity-Ring-Down Spectroscopic (CRDS) for ground-based measurements of dry mixing ratios of methane (CH_4), carbon dioxide (CO_2) and carbon monoxide (CO) within the shallow boundary layer of the atmosphere. In the second project, mid and near infrared spectroscopic techniques are employed to detect and quantify non-methane hydrocarbons (NMHC) as methane tracers in the environment. In addition to playing a significant role in tropospheric chemistry and ozone formation, these NMHC provide critical molecular signatures that are useful in partitioning local and regional CH_4 emissions between various sources.

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Glinski, Robert, Ph.D. ***Professor***	rglinski@tntech.edu 931-372-3420	Molecular emission spectroscopy, astronomical spectroscopy, astrochemistry, dynamics of molecules in astrophysical environments--comets and interstellar media.
Holden, Zachary, Ph.D. ***Instructor***	zholden@tntech.edu	Computational chemistry, QM/MM Simulations including Ewald summation, Chemical Education, Undergraduate PChem lab development, NMR kinetics of H-D exchange in hypophosphite
Jiang, Xiaohua, Ph.D. ***Associate Professor***	xjiang@tntech.edu 931-372-3184	Interactions between thiosemicarbazones and replication enzyme topoisomerase-II-α. Thiosemicarbazones exhibit anti-proliferative activity and can be used as a potential anticancer drug by inhibiting topoisomerase-II-α. Research in our laboratory seeks to understand what characteristics of thiosemicarbazones are important for inhibition as well as the extent these compounds can inhibit topoisomerase-II-α. Our ongoing work encompasses biochemical assays to study the dose-dependency of these compounds with the enzyme and NMR spectroscopy to study the physical interactions between these compounds and the enzyme during inhibition. Our lab is also currently investigating the C-terminus of human topoisomerase-II-α to obtain information about the factors that regulate the activity of the enzyme.
Lisic, Edward, Ph.D ***Professor***	edlisic@tntech.edu 931-372-3425	Coordination chemistry of the transition metals, ligand synthesis, nuclear medicine. Director of the Undergraduate Research Program (U.R.E.C.A. and C.I.S.E.)
Majors, Twanelle, Ph.D. ***Instructor***	tmajors@tntech.edu 931-372-3425	Plant compounds suitable for agrichemical and medicinal applications, AP Chemistry, assessment development and quantitative evaluation, K-16 non-majors multicultural STEM pedagogies and assessment, impact of deficit ideologies on STEM learners.
Moldenhauer, Jonathan, Ph.D. ***Instructor***	jmoldenhauer@tntech.edu 931-372-6866	Fundamental electrochemistry pertaining to basic electrochemical properties and novel solvents, and electrochemical sensors for in situ real time monitoring of analytes.
Mullins, Gene ***Lab Coordinator***	gmullins@tntech.edu 931-372-3536	Instrumentation, method development and application, polymer applications
Rezsnyak, Chad, Ph.D. ***Assistant Professor***	crezsnyak@tntech.edu 931-372-6282	Development and implementation of novel pedagogies and resources to improve the educational experience of chemistry students
Rust, Kathryn ***Instructor***	krust@tntech.edu 931-372-3423	Chemical education
Swartling, Daniel, Ph.D. ***Associate Professor***	dswart@tntech.edu 931-372-3431	Bio-organic and medicinal chemistry. Green and sustainable chemistry. Alternative energy and biofuels. Biomass for sustainable chemical feedstocks.
Zhan, Xuanzhi, Ph.D. ***Assistant Professor***	xzhan@tntech.edu 931-372-3427	Our group is focusing on understanding the mechanisms of ASK1-initialed mitogen activated kinase (MAPK) signaling. We have placed a strong emphasis on reconstructing these interested cellular signal cascades with purified proteins. A combination of biochemical, biophysical, bioanalytical and computational approaches are employed to explore the dynamic movements, post-translational modifications, and protein-protein interactions in these signaling pathways. Particularly, we are focusing on three research areas: (1) the activation mechanisms of ASK1, one of the MAP3Ks; (2) the assembly of ASK1-MKK4/7-JNKs complex, and the molecular recognition between enzyme and substrate; (3) the regulation of scaffold protein (arrestin) in these MAP Kinase cascades.
Zhang, Hong, Ph.D. ***Professor***	hzhang@tntech.edu 931-372-6325	Physical and chemical processes, dynamics, chemical kinetics, molecular mechanisms, consequences, and control of transport, transformation, and cycling of pollutants and natural chemical substances in the environment, crossing air, water, plant, and soil, on local, regional, and global scales in general, and those associated with mercury in particular. Application of analytical chemistry in environmental chemistry.

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		The research areas involve environmental photochemistry, environmental geochemistry, aquatic chemistry, soil chemistry, atmospheric chemistry, environmental biochemistry, environmental analytical chemistry, molecular biogeochemistry, and global biogeochemistry.