

Department of Chemistry

Faculty Expertise/Research

Table 1: Faculty Name and Title

Table 2: Faculty Email Address and Phone Number

Table 3: Overview of Faculty Research Area/Expertise

NAME	EMAIL/PHONE/URL	RESEARCH AREA
Boles, Jeffrey, Ph.D. <i>Professor and Chair</i>	jboles@tnitech.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. <i>Assistant Professor</i>	acallender@tnitech.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 <i>Senior Instructor</i>	acarrick@tnitech.edu 931-372-3426	Chemical education
Carrick, Jesse, Ph.D. <i>Professor</i>	jcarrick@tnitech.edu 931-372-6199	Minor actinide separations from spent nuclear fuel using soft-Lewis basic donors; heterocycle synthetic method development; medicinal chemistry; natural product total synthesis
Carroll, Amanda, Ph.D. <i>Master Lecturer</i>	acarroll@tnitech.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. <i>Associate Professor</i>	wcarroll@tnitech.edu 931-372-6094	NMR spectroscopy, Residual Dipolar Couplings, and physical organic chemistry
Cashman, Derek, Ph.D. <i>Lecturer</i>	dcashman@tnitech.edu 931-372-3434 http://sites.tnitech.edu/dcashman	Computational Biophysics and Medicinal Chemistry. Specific areas of ongoing research include: (a) computational drug discovery of novel antibacterial (DHFR) and antiviral (COVID-19) agents; (b) protein-protein interactions and molecular dynamics simulations of Photosystem I; and (c) 3D printing techniques of biomolecules and small molecules.
Cojocaru, Andreea, Ph.D. <i>Assistant Professor</i>	ocojocaru@tnitech.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 <i>Master Instructor</i>	jcoonce@tnitech.edu 931-372-6521	Chemical Education: Research and design of tutorials, games, and animations for introductory Chemistry students
Dan, David, Ph.D. <i>Assistant Professor</i>	ddan@tnitech.edu 931-372-6819	Radiochemistry
Gichuhi, Wilson, Ph.D. <i>Associate Professor</i>	wgichuhi@tnitech.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

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		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.
Gurusinghe, Ranil, Ph.D. <i>Assistant Professor</i>	rgurusinghe@tntech.edu 931-372-6849	Physical Chemistry
Kristen Johnson, Ph.D. <i>Assistant Professor</i>	knjohnson@tntech.edu 931-372-3233	Applying physical, analytical, and materials chemistry techniques to environmental chemistry. Specific areas include using spectroscopic and microscopic techniques to investigate the physical and chemical processes that contribute to atmospheric particle aging, understanding the transformation and cycling of indoor pollutants, and pollution evaluation and control measures for pollutants of emerging concern.
Majors, Twanelle, Ph.D. <i>Senior Lecturer</i>	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. <i>Senior Lecturer</i>	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.
Murphy, Kyle, Ph.D. <i>Assistant Professor</i>	kmurphy@tntech.edu 931-372-3238	Organic Chemistry, Polymers
Nguyen, Lac Ha, Ph.D. <i>Assistant Professor</i>	lnguyen@tntech.edu 931-372-3425 https://sites.tntech.edu/lhnguyen/	Our research focuses on reticular chemistry – designing new metal-organic frameworks and covalent organic frameworks for energy relevant applications including water harvesting, hydrogen production, and capture of critical ions.
Rezsnyak, Chad, Ph.D. <i>Associate Professor</i>	crezsnyak@tntech.edu 931-372-6282	Development and implementation of novel pedagogies and resources to improve the educational experience of chemistry students
Rust, Kathryn <i>Instructor</i>	krust@tntech.edu 931-372-3423	Chemical education
Zhan, Xuanzhi, Ph.D. <i>Associate Professor</i>	xzhan@tntech.edu 931-372-3427	Our group is focusing on understanding the mechanisms of ASK1-initiated 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. <i>Professor</i>	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

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