Indiana University Department of Chemistry

Associate Instructor Manual

2023 – 2024

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The Academic Office

As an Associate instructor you are both a student and a teacher and it is important for you to know where to go for the different issues in your life. After your first year in the department, whether you teach is a decision made by your research advisor. The Graduate Coordinator will determine your Associate Instructor assignment. If you find a problem with the assignment, you should contact the Graduate Coordinator. Your appointment as an Associate Instructor comes under the umbrella of the Academic Office. The Academic Office (AO) is located in C021 of the chemistry building.

Academic Office Staff	**Undergraduate Laboratory Staff**
Kevin Brown, Director of Graduate Studies, C021F	Norman Dean, Director of Undergraduate Labs, C131
Tom Snaddon, Director of Graduate Admissions, C021F	Rick Armstrong, Undergraduate Laboratory & Outreach Coordinator, C131
Jill Robinson, Director of Undergraduate Studies, A271	Aulaire Schmitz, Organic Laboratory Coordinator, C141B
Kate Pleskac, Graduate Program Coordinator, C021F	Morgan March, Prep Lab Technician, C041C
Dalane Anderson, Graduate Admissions, C021J	
Kayse Ehinger, Scheduling Supervisor, C021E	
Marcia Brown, Administrative Services Assistant, C021	
Stacy Felton, Exam Coordinator, C021H	
Amy Welsh, Academic Advisor, C021D	
Carly Friedman, Academic Advisor, C021C	

Kevin Brown, Director of Graduate Studies. Oversees all aspects of graduate student academics.
Tom Snaddon, Director of Graduate Admissions. Oversees all graduate admissions.
Jill Robinson, Director of Undergraduate Studies. Oversees all aspects of Chemistry undergraduate student issues.
Kate Pleskac, Graduate Service Coordinator. The departmental contact for all graduate student concerns, which include program information, appointments (AI and RA), parking, insurance, fellowships/awards, enrollment, milestone exam scheduling, and dissertation information.
Dalane Anderson, Graduate Admissions Coordinator. The departmental contact for prospective and incoming graduate students. Dalane's responsibilities include recruitment, admissions, student visits, and social media.
Kayse Ehinger, Scheduling Supervisor. The departmental contact with the registrar's office, supervises enrollments, handles loaner textbooks for courses, reserves classroom space for course meetings, CALM issues, exam schedules and processing, and proctoring schedules.
Marcia Brown, Administrative Services Assistant. Assists with all Graduate and Undergraduate functions. Reserves rooms for events (office hours, group meetings, practice talks, review sessions, etc.)
Stacy Felton, Exam Coordinator. Assists with exam prep and processing.
Amy Welch, Academic Advisor. Academic advisor for Chemistry and Biochemistry undergraduate students with the last names that start with A-K.
Carly Friedman, Academic Advisor. Academic advisor for Chemistry and Biochemistry undergraduate students with the last names that start with L-Z. She also handles campus visits to the department by prospective students.
Norman Dean, Director of Undergraduate Laboratories. Supervises the chemistry undergraduate laboratory program. If your course assignment is a laboratory course, he is also your supervisor. He will be notified of students or stockroom staff who have issues with your performance as a lab AI. He is also the person you should contact if you are having issues with the lab staff. He or the Laboratory Coordinators, Rick Armstrong and Aulaire Schmitz, will be observing to make sure you are enforcing departmental safety rules and regulations. Norm teaches a variety of laboratory courses for the department. He is responsible for general oversight of the undergraduate laboratory program, is the primary supervisor of the laboratory staff, and oversees the laboratory budgets. In addition, he develops experiments for the laboratory courses and assists the curriculum committee in planning new courses.

Rick Armstrong, Undergraduate Laboratory & Outreach Coordinator. Manages the day-to-day operations of the general chemistry lab courses (C127, H127, C121, C122, C118, and N337) He works with faculty to design and implement experiments for these courses. In addition, he plans outreach projects to educate students, teachers, and counselors about our program and to encourage a greater interest in science in general. In addition, he helps oversees the AI training and teaches the department's service-learning course, X170.

Aulaire Schmitz, Organic Laboratory Coordinator. Manages the day-to-day operation of the organic and advanced laboratory courses. She works with the chemistry faculty to design and implement experiments for C343, J343, C344, C427, and C437. She is also part of the department's science outreach team and plays a role in AI training for the organic chemistry labs.

Morgan Marsh, Prep Lab Technician. Manages the day-to-day operations of general and inorganic undergrad lab courses (C103, C121, C118, C122, C127, H127, N337). Also assists with science outreach and prepares demos as requested by faculty.

Also associated with the undergraduate office are the department's teaching faculty. Their offices are in various locations around the chemistry building.

Kim Arnold, Lecturer. Kim teaches courses in general chemistry. She enjoys working with students in elementary and general chemistry in C101 and C121. In addition to her teaching, Kim is working with the IU's Advanced College Project (ACP) program to establish a hybrid dual credit course for high school students.

Laura Brown, Teaching Professor. Laura teaches several non-majors and organic chemistry courses for the department while mentoring students in undergraduate research. In addition, Laura serves on the Curriculum Committee and the Undergraduate Awards Committee and is the treasurer for the Southern Indiana Section of the ACS (SISACS).

Ben Burlingham, Senior Lecturer. Ben teaches several general, organic, and biochemistry courses for the department, including service learning. Ben serves on the Curriculum Committee and the Undergraduate Awards Committee.

Sarah Hill, Lecturer. Sarah teaches general and physical chemistry courses.

Sara Mata, Lecturer. Sara teaches organic chemistry courses.

Ali Wood, Visiting Lecturer. Allie teaches general and analytical chemistry.

Meghan Porter, Senior Lecturer. Meghan teaches general and inorganic chemistry courses.

Catherine Reck, Clinical Professor. Cate teaches a diversity of undergraduate classes.

Jill Robinson, Teaching Professor. Jill teaches general and bioanalytical chemistry courses.

Deborah Snaddon, Lecturer. Deborah primarily teaches C103 and oversees the UTIN program.

Jessica Hollenbeck, Senior Lecturer. Jessica teaches general and biochemistry courses.

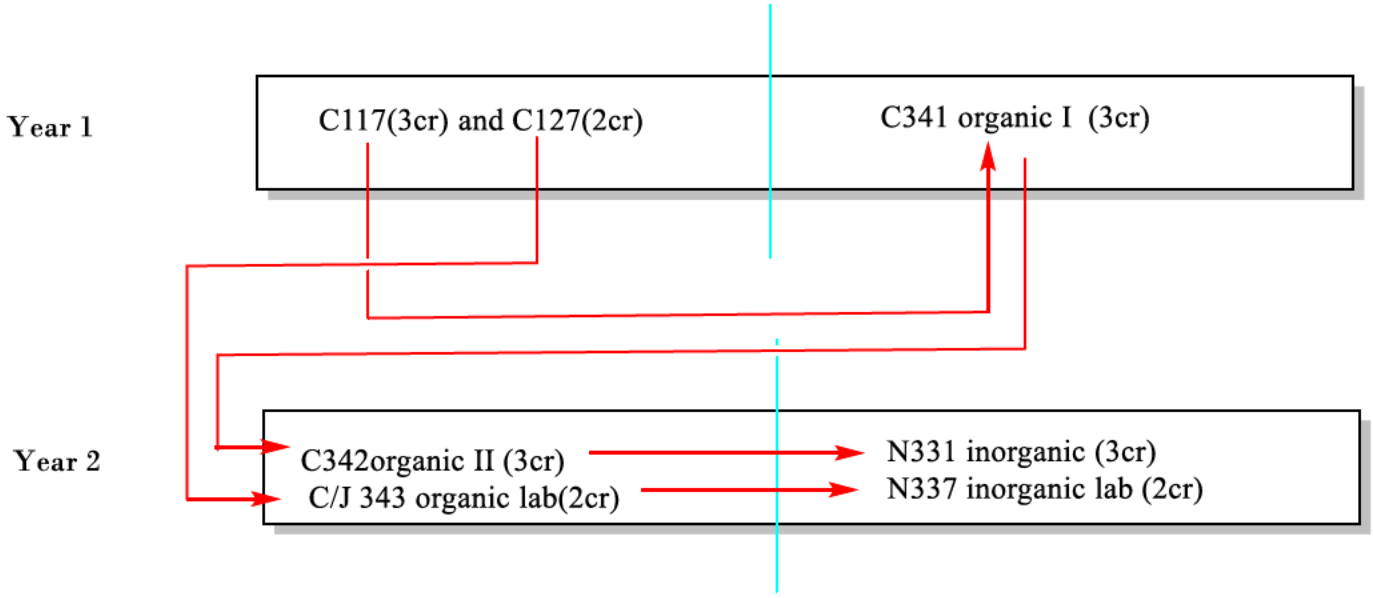
Other Instructional Facilities

Chemistry Duplicating Office (A002). The Chemistry Information Technology Group (ITG) manages the duplicating office in the chemistry department. See ITG for all duplicating services. Please allow 48 hours (large jobs) or 24 hours (small jobs) for duplicating requests. You may be trained for independent use.

The Chemistry Student Center (C046/C006). The Chemistry Student Center houses several computer workstations for use by students. These computers have access to all departmentally sponsored software. The center also has three semi-private spaces that can be reserved for office hours (see the Academic Office), and several couches and lounge chairs that can be used for informal group study sessions.

The Center for Innovative Teaching and Learning (CITL). The Center for Innovative Teaching and Learning (CITL) provides comprehensive services supporting excellent teaching and learning at Indiana University Bloomington. They run a variety of teaching workshops throughout the semester that are open to Associate Instructors. You are encouraged to make use of their services.

The IU Curriculum Quick Guide



A modified 1:2:2:1 sequence

The diagram above shows the typical first two years of chemistry courses for an IU science student. The red arrows indicate which courses are pre-requisites for later courses. The department also teaches a course (C103) for students preparing to take C117, and a sequence of courses for allied health majors (C101/121, C102/122).

Course Descriptions for the Courses AI's Teach

(From the Indiana University College of Arts and Sciences Undergraduate Bulletin)

Most first year Associate Instructors are assigned to teach a 100-level course, but some may be assigned to an upper-level course such as a Biochemistry, Organic, Analytical, or Physical Chemistry course. The Graduate Office makes AI Teaching Assignments and if you have strong preferences with regards to your assignment, please let the Graduate Coordinator or Director of Graduate Studies know. AIs assigned to a lecture course lead discussion sections for that course. Students register for a discussion section when they register for a lecture. A discussion section lasts 50-minutes. AI's assigned to a laboratory course lead one or two laboratory sections. 100-level laboratories are 3 hours and Organic laboratories are 4 hours.

CHEM-C 100 The World as Chemistry (3 cr.) For non-science majors, the chemistry of everyday life: fuels, plastics, drugs, water, air, and living systems. Lectures illustrated by demonstrations, films, and molecular models. Readings include articles from current newspapers and magazines.

CHEM-C 101 Elementary Chemistry I (3 cr.) Usually taken concurrently with CHEM-C 121. Essential principles of chemistry, atomic and molecular structure, bonding, properties and reactions of elements and compounds, stoichiometry, solutions, and acids and bases. For students who are not planning careers in the sciences and for those with no previous coursework in chemistry.

CHEM-C 102 Elementary Chemistry II (3 cr.) P: CHEM-C 101. Usually taken concurrently with CHEM-C 122. Continuation of CHEM-C 101. The chemistry of organic compounds and their reactions followed by an extensive introduction to biochemistry.

CHEM-C 103 Introduction to Chemical Principles (5 cr.) Designed specifically to alleviate deficiencies in chemistry and prepare students for CHEM-C 117-CHEM-C 127. Content includes applications of measurement and chemical formula/equation conversions; modern view of the atom; and solution processes that relate to chemical reactions. Lectures, labs, and discussion sections will emphasize problem-solving strategies.

CHEM-C 107 Frontiers of Chemical Research (1 cr.) P: One semester of college-level chemistry or consent of instructor. A freshman seminar featuring talks and demonstrations by various faculty about current research in analytical, biological, inorganic, organic, and physical chemistry.

CHEM-C 114 Chemistry of Art (3 cr.) Explores the intersection of chemistry with the visual arts, to learn and appreciate chemistry commingled in the world of art. Covers the basic principles of chemistry and its applications as a way to understand the chemical and physical nature of color, paints, pottery, sculpture, photography, and more.

CHEM-C 116 Problem Solving in General Chemistry (2 cr.) P: Consent of department. C: CHEM-C 117. Problem solving course aimed at boosting student success while taking CHEM-C 117. Course meets weekly during which time students will be guided through problem solving and success strategies for science classes. S/F grading.

CHEM-C 117 Principles of Chemistry and Biochemistry I (3 cr.) P: CHEM-C 101 and CHEM-C 121; or CHEM-C 103; or chemistry and math placement examinations and consent of the department. Lecture course covering basic principles of chemistry and biochemistry, basic mathematical and conceptual principles in atomic structure and periodic properties, molecular structure, chemical bonding, energy (thermochemistry), kinetics, equilibrium, and thermodynamics.

CHEM-J 117 Principles of Chemistry & Biochemistry for Science Majors (3 cr.) P: Chemistry and Math placement examinations; and consent of the department. A course for well-prepared science majors. Lecture course covering basic principles of chemistry and biochemistry.

CHEM-H 117 Principles of Chemistry and Biochemistry I, Honors (3 cr.) P: Chemistry and math placement examinations; and consent of department. An honors course for students with unusual aptitude or preparation. Covers basic principles of chemistry and biochemistry, basic mathematical and conceptual principles in atomic structure and periodic properties, molecular structure, chemical bonding, energy (thermochemistry), kinetics, equilibrium, and thermodynamics.

CHEM-C 118 Principles of Chemistry and Biochemistry II (5 cr.) P: CHEM-C 117, CHEM-H 117, CHEM-J 117, or CHEM-C 105; and CHEM-C 125, CHEM-C 127, CHEM-H 127, or CHEM-X 150; or CHEM-S 117. Integrated lecture-laboratory course building on principles taught in CHEM-C 117. Topics include solutions, equilibria, electrochemistry, nuclear reactions, and transition metals. Additional topics may include polymers, drug design, and atmospheric chemistry. Focuses on application-based problem solving.

CHEM-C 121 Elementary Chemistry Laboratory I (2 cr.) P or C: CHEM-C 101. Introduction to the techniques and reasoning of experimental chemistry. Emphasis is given to study of physical and chemical properties of inorganic compounds.

CHEM-C 122 Elementary Chemistry Laboratory II (2 cr.) P: CHEM-C 101 and CHEM-C 121. P or C: CHEM-C 102. Continuation of CHEM-C 121. Emphasis on organic and biochemical experimental techniques.

CHEM-C 127 Principles of Chemistry and Biochemistry I Laboratory (2 cr.) P or C: CHEM-C 117, CHEM-H 117, or CHEM-J 117. Basic principles of chemistry and biochemistry that align with the topics in CHEM-C 117. Chemical bonding (atomic structure, molecular structure, molecular orbital theory, and non-covalent interactions), macroscopic properties (energy, kinetics, equilibrium, and thermodynamics). Hands-on laboratory techniques in chemistry necessary for success in later chemistry laboratory courses, especially organic chemistry.

CHEM-H 127 Principles of Chemistry and Biochemistry I Laboratory, Honors (2cr.) P or C: CHEM-H 117 or CHEM-J 117. Basic principles of chemistry and biochemistry that align with the topics in CHEM-J 117 and CHEM-H 117. Hands-on laboratory techniques in chemistry necessary for success in later chemistry laboratory courses, including course-based undergraduate research project.

CHEM-X 150 ASURE Chemistry Research Lab 1 (3 cr.) P: CHEM-C 117, CHEM-H 117, or CHEM-J 117 with a grade of C- or higher. First in a two-lab sequence for students in the Arts and Sciences Undergraduate Research Experience (ASURE) program. Students engage in guided research in teams. The research area of the class will vary by section and be determined by the faculty member associated with the section.

CHEM-X 170 Chemistry Community Outreach Seminar (0-2 cr.) P: CHEM-C 105, CHEM-C 117, CHEM-H 117 or CHEM-J 117; and CHEM-C 125, CHEM-C 127, CHEM-H 127, or CHEM-X 150. C: Current enrollment in another chemistry course. Provides opportunities to work within the community to foster interest, knowledge, and appreciation of the sciences. Includes preparation and execution of demonstrations and in-class lessons at primary and secondary school levels. May be repeated for a maximum of 6 credit hours.

CHEM-C 240 Preparation for Organic Chemistry (2 cr.) P: CHEM-C 106, CHEM-C 117, CHEM-H 117, CHEM-J 117 or CHEM-S 117. Problem-solving course aimed at boosting student success while taking CHEM-C 341. Students will be guided through problem-solving and success strategies for science classes.

CHEM-C 243 Supplemental General Chemistry (2 cr.) P: CHEM-C 105 with a grade of C- or higher. For transfer students with General Chemistry I credit from regional campuses or other colleges who plan to take organic chemistry. Equilibrium, kinetics, and thermodynamics will be covered. General Chemistry I plus this course is strongly recommended as preparation for CHEM-C 341.

CHEM-X 270 Overseas Study Seminar: Timmy Global Health (1-2 cr.) This service course enables students to learn about the history, customs, culture, political, social and environmental diversity of the Guatemalan and Mayan people or Dominican Republic. A one-week service trip to Guatemala over spring break or to the Dominican Republic in May to work toward impacting these indigenous populations is required. May be repeated for a maximum of 12 credit hours in CHEM-G 203 and CHEM-X 270.

CHEM-A 314 Biological and Environmental Chemical Analysis (2 cr.) P: CHEM-C 341, CHEM-R 340, or CHEM-S 341; and MATH-M 119, MATH-M 211, or MATH-S 211. Theory and application of analytical techniques, including statistical treatment of data, spectroscopy, separation methods, electroanalytical methods, radioisotopes, and immunological methods.

CHEM-A 315 Chemical Measurements Laboratory (2 cr.) P: CHEM-A 314; or CHEM-C 317 and CHEM-C 318. Application of analytical techniques and instrumentation to qualitative and quantitative chemical analysis. Theory, instrumentation, and data analysis will be covered.

CHEM-A 316 Bioanalytical Chemistry Laboratory (2 cr.) P or C: CHEM-C 318 or CHEM-A 314. Laboratory experiments involve the application of analytical techniques and instrumentation to chemical analysis of biological samples. Methods include spectroscopy, immunoassays, chromatography, electrophoresis, and mass spectrometry.

CHEM-C 317 Equilibria and Electrochemistry (2 cr.) P: A grade of C- or higher in CHEM-C 341; CHEM-R 340, or CHEM-S 341; and MATH-M 211, MATH-S 211, or MATH-M 213. Treatment of analytical data; chemical equilibrium; redox titrations; electrochemical theory; potentiometry; voltammetry; coulometry.

CHEM-C 318 Spectrochemistry and Separations (2 cr.) P: A grade of C- or higher in CHEM-C 341; CHEM-R 340, or CHEM-S 341; and MATH-M 211, MATH-S 211, or MATH-M 213. Ultraviolet, visible, infrared, and luminescence spectrophotometry; flame and electrical discharge techniques; X-ray and mass spectrometric methods; phase equilibria and extractions; counter current distribution; gas, thin-layer liquid, and high-performance liquid chromatography.

CHEM-C 321 Advanced and Nanoscale Materials (3 cr.) P or C: [CHEM-C 342 or CHEM-S 342; and CHEM-C 343, CHEM-J 343 or CHEM-S 343]; or [PHYS-P 202 or PHYS-P 222]; or consent of instructor. Interdisciplinary course bridges chemistry, materials science, physics and biology by focusing on concepts crucial to understanding the structure-function relationships of materials and their nanoscale properties. Elucidates these concepts through study of contemporary and advanced materials: e.g., metal and magnetic nanoparticles, semiconductor quantum dots, biomaterials, polymers, surfactants, and liquid crystals.

CHEM-X 325 ASURE Chemistry Research Lab II (3cr.) P: CHEM-X 150 with a grade of C- or higher. Second in a two-lab sequence for students in the Arts and Sciences Undergraduate Research Experience (ASURE) program. Students engage in guided research in teams. The research area of the class will vary by section and be determined by the faculty member associated with the section.

CHEM-N 331 Intermediate Inorganic Chemistry Lecture (3 cr.) P: CHEM-C 342, CHEM-R 340, or CHEM-S 342; and CHEM-C 343, CHEM-J 343, or CHEM-S 343. R: Usually taken concurrently with CHEM-N 337. Focuses on structure, bonding, and reaction mechanisms of inorganic compounds using molecular orbital theory as a basis for metal-ligand interaction. Compounds covered include transition metal coordination compounds, organometallic compounds, and bioinorganic complexes. Other topics include redox chemistry, nuclear chemistry, and an introduction to solid-state chemistry.

CHEM-N 337 Intermediate Inorganic Chemistry Laboratory (2 cr.) P or C: CHEM-N 331. Focuses on the application of foundational material covered in CHEM-N 331. Lab works includes synthesis of transition metal complexes and investigation of structure and bonding using multiple spectroscopic techniques. Base-level computations will be carried out in support of lab work. Also emphasizes the development of professional writing skills.

CHEM-R 340 Survey of Organic Chemistry (3 cr.) P: CHEM-C 106, CHEM-C 117, CHEM-H 117, CHEM-J 117, CHEM-S 117 or consent of instructor. A survey of classes, structure, and reactivity of carbon-based compounds with an emphasis on those found in biological systems.

CHEM-C 341 Organic Chemistry I Lectures (3 cr.) P: CHEM-C 106, CHEM-C 117, CHEM-C 243, CHEM-H 117, CHEM-J 117, or CHEM-S 117. Chemistry of carbon compounds. Nomenclature; qualitative theory of valence; structure and reactions. Syntheses and reactions of major classes of monofunctional compounds.

CHEM-S 341 Organic Chemistry I Lectures, Honors (3 cr.) P: Grade of B+ or higher in CHEM-C 117, CHEM-H 117, CHEM-J 117, or CHEM-S 117; or consent of instructor. For students with unusually good aptitude or preparation. Chemistry of carbon compounds. Nomenclature; qualitative theory of valence; structure and reactions. Syntheses and reactions of major classes of monofunctional compounds.

CHEM-C 342 Organic Chemistry II Lectures (3 cr.) P: CHEM-C 341, CHEM-R 340, or CHEM-S 341 with a grade of C- or higher. Syntheses and reactions of polyfunctional compounds, natural and industrial products.

CHEM-S 342 Organic Chemistry II Lectures, Honors (3 cr.) P: CHEM-S 341. Special course for students with unusually good aptitude or preparation, covering same subject matter as CHEM-C 342.

CHEM-C 343 Organic Chemistry I Laboratory (2 cr.) P: A grade of C- or higher in CHEM-C 127, CHEM-H 127, CHEM-S 117, or CHEM-X 150; and CHEM-C 341, CHEM-R 340, or CHEM-S 341. R: CHEM-C 342 or CHEM-S 342. Laboratory instruction in the fundamental techniques of organic chemistry, spectroscopy, and the use of general synthetic methods.

CHEM-J 343 Organic Chemistry I Laboratory, for Science Majors (2 cr.) P: CHEM-C 127, CHEM-H 127, or CHEM-X 150; and CHEM-C 341 or CHEM-S 341. P or C: CHEM-C 342 or CHEM-S 342. Covers same material as CHEM-C 343 at the level required for chemistry and biochemistry majors.

CHEM-C 344 Organic Chemistry II Laboratory (2 cr.) P: CHEM-C 342 or CHEM-S 342; and CHEM-C 343, CHEM-J 343, or CHEM-S 343. Preparation, isolation, and identification of organic compounds; emphasis on modern research methods.

CHEM-C 360 Introductory Physical Chemistry (3 cr.) P: CHEM-C 106, CHEM-C 117, CHEM-C 243, CHEM-J 117, or CHEM-S 117; and MATH-M 119, MATH-M 212, or MATH-S 212; and PHYS-H 221, PHYS-P 201, or PHYS-P 221. Elements of thermodynamics, reaction kinetics, molecular quantum states, and spectroscopy. For students not intending to specialize in physical sciences.

CHEM-P 360 Physical Chemistry for Biochemists (3 cr.) P: CHEM-C 106, CHEM-C 117, CHEM-J 117, CHEM-H 117, or CHEM-S 117; and MATH-M 212 or MATH-S 212; and PHYS-H 221, PHYS-P 201 or PHYS-P 221. Recommended C: PHYS-H 222, PHYS-P 202, or PHYS-P 222. Covers elements of thermodynamics, reaction kinetics, molecular quantum states and spectroscopy, focusing on an intuitive approach to these topics at an intermediate level of mathematical rigor.

CHEM-C 361 Physical Chemistry of Bulk Matter (3 cr.) P: CHEM-C 106, CHEM-C 117, CHEM-C 246, CHEM-H 117, CHEM-J 117, CHEM-S 106, or CHEM-S 117; and MATH-M 212 or MATH-S 212; and PHYS-H 222, PHYS-P 202, or PHYS-P 222. Thermodynamics laws, free energy and chemical potentials, gases and dilute solutions, phase transitions, colligative properties, chemical equilibria, ionic solutions, chemical kinetics and transport processes, current topics.

CHEM-C 362 Physical Chemistry of Molecules (3 cr.) P: CHEM-C 106, CHEM-C 117, CHEM-C 243, CHEM-H 117, CHEM-J 117, CHEM-S 106, or CHEM-S 117; and MATH-M 212 or MATH-S 212; and PHYS-H 222, PHYS-P 202, or PHYS-P 222. R: CHEM-N 330 and MATH-M 311. Quantum states and spectroscopy of molecules, statistical thermodynamics, and elementary kinetic theory, current topics.

CHEM-P 364 Basic Measurements in Physical Chemistry (2 cr.) P or C: CHEM-C 361. Experiments conducted elucidate concepts explored in physical chemistry, such as heats of fusion, heat capacities, bomb calorimetry, transport properties, chemical kinetics and basic spectroscopy.

CHEM-X 371 Internship in Chemical Instruction (0-2 cr.) P: Consent of department. Neither CHEM-G 499 nor CHEM-X 371 may count toward credit hours in the major. Supervised experience in teaching an undergraduate chemistry course. May be taken up to three times. S/F grading.

CHEM-C 372 Chemical Informatics II: Molecular Modeling (2 cr.) P: CHEM-C 341 or CHEM-S 341. Molecular modeling and computational chemistry; application of quantum mechanics and molecular mechanics to derive structural and energetics information about molecules; conformational analysis; quantitative structure-activity relationships (QSAR) and related methods for drug design.

CHEM-X 373 Professional Practice in Chemistry (1-6 cr.) P: Consent of department. Course credit may count as elective hours in the B.S. in chemistry and B.S. in biochemistry majors. Designed to provide opportunities for students to receive credit for career-related, full-time work. Evaluation by employer and Director of Undergraduate Studies. May be repeated for a maximum of 6 credit hours in CHEM-X 373 and CHEM-Y 398. S/F grading**.**

CHEM-C 383 Human Biochemistry (3 cr.) P: CHEM-C 341, CHEM-R 340, or CHEM-S 341 with a grade of C- or higher. Introduction to macromolecular structure, central metabolism, and chemical basis of biological information flow.

CHEM-X 399 Chemical Research (0-3 cr.) P: Consent of research director and department. For outstanding students. Provides opportunity to perform research in an IU Chemistry Department lab. Written research thesis is required. Cannot be used as a substitute for other chemistry courses. May be repeated for a maximum of 10 credit hours in CHEM-C 409 and CHEM-X 399.

Chem-C 427 Materials Chemistry Laboratory (2 cr.)

CHEM-C 430 Inorganic Chemistry (3 cr.) P: CHEM-C 106, CHEM-N 330, or CHEM-N 331. R: CHEM-C 362. Structure and bonding of inorganic compounds; survey of chemistry of the Periodic Table, group theory, electronic spectroscopy of coordination compounds, organometallic compounds, catalysis, mechanisms, and reactions.

CHEM-C 432 Spectroscopic Methods in Inorganic Chemistry (3 cr.) P: CHEM-C 360 or CHEM-C 361; and CHEM-C 430. Chemical applications of group theory and the elucidation of structure and bonding in inorganic molecules and complexes by vibrational, nuclear magnetic resonance, Mossbauer, and electronic absorption spectroscopy.

CHEM-C 437 Inorganic Chemistry Laboratory (2 cr.) P: CHEM-N 330 or CHEM-N 337. Synthesis, characterization, and study of chemical and physical properties of inorganic and organometallic compounds.

CHEM-C 443 Organic Spectroscopy (3 cr.) P: CHEM-C 342 or CHEM-S 342; and CHEM-C 343, CHEM-J 343, or CHEM-S 343. Elucidation of molecular structures by use of IR, UV, NMR, mass spectroscopy, and other methods.

CHEM-C 446 Organic Chemistry III (3 cr.) P: CHEM-C 342 or CHEM-S 342. Further develops concepts introduced in Organic Chemistry I and II. Advanced topics include retrosynthesis, kinetics, catalysis, organometallic chemistry, FO theory and pericyclic reactions, heterocycles, mechanism, radicals and carbenes, polymers, solid phase synthesis of peptides and organic synthesis.

CHEM-C 460 Nuclear Chemistry (3 cr.) P or C: CHEM-C 360, CHEM-C 361, or CHEM-C 362. Fundamentals of nuclear behavior; nuclear properties, radioactive decay, and nuclear reactions; applications of nuclear phenomena, biological effects of radiation, nuclear analytical techniques, tracers, radioisotope dating, nuclear power, and the origin of the chemical elements.

CHEM-P 464 Advanced Measurements in Physical Chemistry (2 cr.) P: CHEM-P 364. P or C: CHEM-C 362. The tools of designing experiments in modern physical chemistry will be explored in this laboratory course. Students will work through the layers involved in physical experiments from its genesis through data analysis. Components of the class include electronics, computer interfacing, vacuum and laser technology, particle or photon detection, and computations.

CHEM-C 481 Physical Biochemistry (3 cr.) P: CHEM-C 361 or CHEM-P 360; and CHEM-C 484. Physical chemistry of biological macromolecules; structure and conformation of proteins and nucleic acids; thermodynamics and kinetics of biochemical reactions.

CHEM-C 483 Biological Chemistry (3 cr.) P: CHEM-C 342, CHEM-R 340, or CHEM-S 342. Introduction to structure, chemical properties, and interrelationships of biological substances.

CHEM-C 484 Biomolecules and Catabolism (3 cr.) P: CHEM-C 342 or CHEM-S 342. Structure and function of cellular components and the generation of phosphate-bond energy.

CHEM-C 485 Biosynthetic Pathways and Control of Metabolism (3 cr.) P: CHEM-C 484. Biosynthetic pathways, control of metabolism, and drug design.

CHEM-B 486 Gene Expression and Physiology (3 cr.) P: C484 or permission of instructor. Biosynthesis of macromolecules, control of gene expression, advanced topics in biochemistry.

CHEM-B 487 Biochemistry Laboratory (2 cr.) P: C343 or S343, and C484. P or C: C485. Laboratory instruction in the fundamental techniques of protein biochemistry, including separation of macromolecules by electrophoresis and chromatography; isolation, purification, and analysis of enzymes; and methods for probing protein- ligand interactions.

CHEM-C 487 Biochemistry Laboratory (2-3 cr.) P: C343 or S343, and C484. Laboratory instruction in the fundamental techniques of biochemistry, including separation of macromolecules by electrophoresis and chromatography; isolation, purification, and analysis of enzymes; recombinant DNA procedures; and polymerase chain reaction (PCR).

CHEM-B 488 Advanced Biochemistry Laboratory (2 cr.) P: B487. P or C: C485. Laboratory instruction in the fundamental techniques of nucleic acid chemistry, including assay methods, nucleic acid purification strategies, recombinant DNA procedures; transformations, protein expression systems, polymerase chain reaction (PCR) methodologies, and methods of genomic analysis.

Associate Instructor Duties and Responsibilities Quick Guide

*All AI Appointments have the following **minimum** requirements. The courses' instructor **MAY** have additional requirements for a specific course.*

Attend ALL sections of the lab/discussion that has been assigned to you

Attend ALL lectures for the course

Attend weekly AI meeting

Hold one office hour a week per section you are assigned
(2 labs = 2 office hours, 4 discussions = 4 office hours)

Proctoring Exams
*You may have to proctor exams for courses other that the course you are teaching

Grading Exams
*You may have to grade exams for courses other than the course you are teaching

*These modifications are to balance teaching loads among the graduate students and to meet university requirements that there be at least 2 proctors per classroom in the event of an emergency.

Associate Instructor Duties and Responsibilities

As an Associate Instructor for the chemistry department, you have several responsibilities. These include teaching your classes, holding office hours, attending meetings with your course professor, proctoring exams, and grading your student's assignments. In all these areas, you have an obligation to act in the most professional manner possible. In a few short months, for many of you, you have gone from student to teacher. It is important for you to treat your students the same way you would want to be treated.

Your AI position is a 20-hour a week job. Your time in class and office hours count towards that total weekly commitment, as does the time you are expected to be in lecture, AI meetings, and your preparation and grading time. If at any time you cannot fulfill an assignment (an office hour, a proctoring assignment…), it is YOUR responsibility to find a qualified replacement following course protocols and to let the proper people know whom your replacement will be. If you find that you are routinely exceeding 20-hours a week, please discuss with your course instructor, and the Director of Graduate Studies if necessary.

1. Lecture Attendance

Attending EVERY lecture of your assigned course is part of your AI agreement. When you are attending class, you should set an example for your students and other AI's students. Do not be listening to music, watching videos, or reading the newspaper. Your professor may use active learning techniques in which you will assist students who are doing lecture group work. As an AI, it is important that you understand and enforce all the professor's course policies. If you do not attend lectures, you will not have the information given to the students and may give them misinformation later.

2. AI Meeting Attendance

Most courses with multiple discussion or lab sections will have a weekly AI meeting. This is the opportunity for you to ask the professor questions concerning course issues. It is also another opportunity for you to find out what the professor is expecting of the students (and of you). Attendance at AI meetings is mandatory. You should come prepared by being familiar with the upcoming course material and completing any specific assignments the professor has made. If for some reason you cannot attend an AI meeting inform the professor and arrange to get any special information presented from another AI. Failure to meet your AI duties can lead to AI Probation. Your professor will write a letter to the graduate office for placement on AI probation. This will typically result in your being required to meet with the Director of Graduate Studies. If placed on probation, and the problem persists it can lead to your losing your AI position for the following term, and possibly your financial package if other means of support are not available.

3. Office Hours

You must hold office hours every week for the course you are assigned. As a minimum rule, you will hold 1 office hour a week for every section you are assigned to, ex: 2 labs = 2 office hours, 4 discussions = 4 office hours. These can be broken up into 1-hour sections on different days of the week, or if you have a lot, you may do multiple hours at a time on a few days per week. These office hours should be held in a room in the Chemistry Building, and you can reserve your room/time through the Academic Office at the beginning of each semester. Make sure to check with the faculty member teaching your course as they may have additional office hour requirements for you.

4. Proctoring Exams

The course instructor will schedule proctoring duties for in-class and evening exams and grading. Some AI course assignments will not have evening exams, so those AI's may have to proctor other course exams that have a large number of students enrolled and the scheduling supervisor will assign you to those courses. The exam and proctoring schedule are emailed a week before each exam date. Exams rooms can be in the Chemistry Building or anywhere on campus and will not be in the same room for each exam. Evening exams are either on Tuesday, Wednesday, or Thursday nights from 7:15p-9:15 and early exams are on the same days from 5:15p-7:15p. The early exam room can have several

different courses taking exams on that date. If you are proctoring an early exam, you will have the added responsibility of picking up the early exam materials from the Academic Office before 4:00p the day of the exam.

When you are proctoring, your job is to monitor the students to ensure that they are not attempting to cheat on the exam. You should only use your phone if you are trying to reach your professor or head AI to ask a question. You are not to be grading, reading, or engaging in any other activities that take your attention away from the room. Move around the room and watch what the students are doing. If you see something suspicious, alert one of the other AI's in the room and ask them to confirm what you are seeing. If you agree there is a problem, try to document the situation as much as possible and alert the professor or head AI. It is acceptable to ask a student to move to another seat and therefore a good idea to leave one or two places in the front of the room available. Do not stop the student from taking the exam but keep their exam papers separate from the other exams. If you believe they were copying off a particular student, try to keep that exam separate as well for later comparisons. At the end of the exam, collect the exam materials, check student ID's, and do your best to keep the room quiet. Refer all exam questions from the students to the instructor. You do not want students trying to get answers while they are waiting to turn the exam in. Return the materials to the UGO after the exam.

a. Before the Exam

i. Make sure all books, notes, cell phones, and calculator covers are put away in backpacks on the floor
ii. Hats with bills should be turned backwards or taken off
iii. Only items allowed out (if applicable) are non-programmable calculators (w/o cover), pencil or pens, exam and answer sheet
iv. When handing out exams, alternate versions (if applicable)
v. Have students sit every other seat and every other row if possible

b. During the Exam

i. Constantly be on the lookout for cheating
ii. Walk around the room and keep your eyes on the students
iii. Proctors are to stay alert and should not be talking, reading, surfing the net, or texting on phones
iv. If a student asks a question on the exam, you should respond: "read the question carefully and choose what you feel is the best answer." Do not try to explain what the question means; this is unfair to others taking exams in other areas and is not your responsibility

c. At the End of the Exam

i. Collect all exams and scantrons (unless notified differently from the instructor)
ii. Collect all borrowed calculators and pencils
iii. Make sure that the student's name is on top of their exam and that the scantron has been filled out correctly (see below for example)
iv. Verify student identity with an IU Crimson Card or Driver's License. If a student failed to bring an ID, have the student sign their name on the back of their exam or scantron. Keep those exams/scantrons separate and notify the Academic Staff and instructor of those students without ID's.

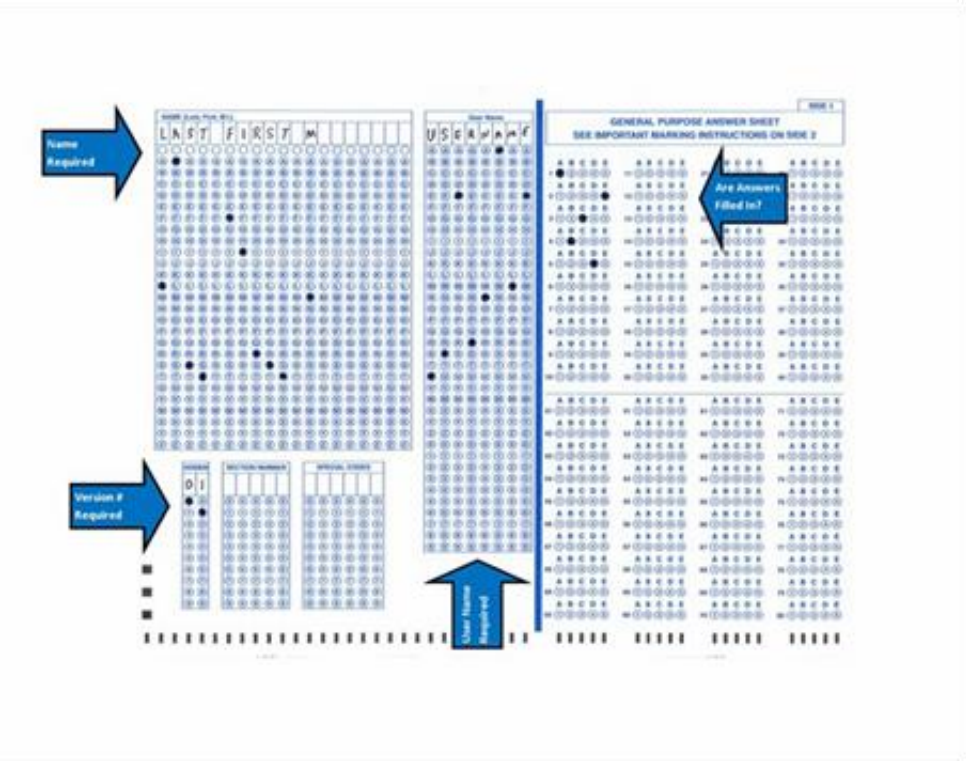
Scantron Answer Sheets must have the following information:

-Last and First Name listed and circles filled in

-Version Number and circle filled in

-User Name listed and circles filled in

-Exam Answers filled in



5. Grading Exams

Exam grading is at a predetermined time after the exam and done as a group. Other course grading will be your personal responsibility. You should schedule sufficient time every week to complete your grading. It is unfair to your students not to receive graded materials back in a prompt manner. Not only do they have a right to know how they are performing in the class, but they also need the opportunity to use your comments on assignments to help them improve future work. Freshman students are accountable at a college standard for the first time, so it is important to grade assignments in a timely manner. It is also important that you grade fairly. It is not acceptable to give every one of your students a perfect score because you are busy with your research project and do not want to spend the time to grade the assignment. Follow the grading guidelines given to you by your professor.

Teaching a Discussion Section

When it comes to teaching, the old saying "you don't get a second chance to make a good first impression" really comes into play. Preparation is the key to being an effective teacher. As an AI, your preparation needs to include:

- attending lecture so you know what the course professor has presented to the students
- attending AI meetings so you know the professor's philosophy with regards to the various course topics
- reading through the text so you are familiar with the way your students will be thinking about the material
- thinking about your time in as an undergraduate in chemistry
- re-familiarize yourself with each topic for concepts and processes that you had difficulty with and that your students are likely to find difficult.

Preparation for your very first class of the semester is especially important. Some things that you should do include finding the room ahead of time (you do not want to be late to the first class meeting), knowing what technology is available in the room and how to use it, and dressing and acting professionally. By the middle of the semester, once you have established a relationship with your class it may be all right to show up in jeans and a t-shirt but on the first day aim more for a "business casual" look. Things you should bring include a copy of your class roster so you can call roll, a copy of the textbook, and a calculator if you anticipate solving problems. You should also consider bringing a copy of the syllabus for the course, as on the first day you will likely get many questions about course schedules and policies.

In the past, teaching a discussion section often involved asking about specific homework questions that were causing difficulty for the students and working them yourself on the board. This is NOT the way to use your time with the students. Make your discussion sections interactive. There are several ways you could approach this. Ask students to come to the board and begin solving the problem (ask more than one at a time). When one student is stuck, ask another to jump in and go on. Do not count on students to ask questions and DO NOT just let them leave without discussing course material. Often your course professor will ask you to go over certain types of problems and may even give you specific questions to work with the students. If not, choose some more challenging questions from the text to use in your discussion section. For problems that are more difficult, it is good to allow the students to work on the problem in small groups first. The "Think-Pair-Share" strategy is a great approach to facilitating engaging discussion sections. Have them start on their own for a few minutes- tell them how long they have. Remind them that this would be about all the time they might want to spend on a similar exam problem. After time is up have them form groups to discuss the problem. If they start in groups, give them a time limit and at the time limit have one group member move to a different group. This person is going to be a messenger. After discussing the problem with the other group (again for a set amount of time) they go back to their original group and bring back other ideas with them. Do not just let two group exchange members. This is most effective if the rest of the original group is learning how a third group approached the problem. Technically this is called a "jigsaw". If you feel more comfortable playing a more direct role in the class, there are still ways to make the time more meaningful to your students. One way, rather than directly working on the problem for the students, is to work with them on developing a strategy for the problem first. Once this flow chart is developed, they can then attack the individual elements needed to complete the problem. As much as possible try to answer their questions by asking questions, make them work to see the final result- the correctly completed solution.

Having something tangible from the session can help students in their individual studies. Consider having a handout they can take with them. You could start your class with a one question "quiz" or give them a list of important concepts from the chapter under study (yes, it is often already at the back of a chapter). In an organic class, they could build a model of a particular molecule.

During the semester, do the best you can to learn your students' names. This skill comes easier to some than others. As much as possible, use their names when you see them in office hours, in lectures, and even if you pass them in the

hallways of the chemistry building. You may ask them to set up their names, including audio recordings with pronunciations, in Canvas.

Teaching a Laboratory Section

Teaching a laboratory section involves different responsibilities than teaching a discussion section. Preparation is still going to be the key to making your teaching assignment a rewarding experience for both you and your students. The first day your lab meets, you are not likely to be performing a true experiment so you still may want to dress in a slightly more professional manner. Once true experiments start however, you will probably want to dress in clothing more appropriate to being in a lab.

Please remember that all clothing requirements for your students also apply to you. Do **NOT** show up in shorts, sleeveless shirts, wearing sandals, or any other clothing that would be in violation of the safety agreement.

All of the chemistry laboratories are located in the chemistry building, so you will not have to go far to find your room. The laboratory doors to the main hallways remain locked. This is a security measure to both prevent theft of equipment and protect students in the event that there is a gunman in the building. If students leave the laboratory for any reason during the course of a lab class, someone in the lab will need to allow them back into the room. Never block the doors open. This is especially important as the laboratories have an active air monitoring system that constantly measures the room and the hall pressure in an effort to keep the labs at a slight negative pressure. This helps ensure that vapors in the room do not escape to the hallways when the door is open. When the door is blocked open, the system cannot maintain the proper pressure in the room. To enter the room, you as an AI should enter through the door from the back hallway. The back hallway door is marked Chemistry Personnel Only across from room C033. There is an elevator in the back hallway that goes to the first floor.

It is critical that you arrive early to your lab section. When you arrive each day, the first thing you should do is get a checklist from the back hall. There are samples of both the upstairs and the downstairs lab sheets included below. The next thing you should do is locate the reagents and equipment you will need for the experiment you are performing. Labs meet almost constantly throughout the day and the prep lab staff will not be coming in and cleaning/reorganizing before your section. If the class before you left the lab in an inappropriate condition, then note it on the back of the checklist and return equipment and chemicals to their proper locations for your students. If reagent bottles are empty, you can bring them to the prep room for refilling before your class meets. If there are enough chemicals to get started, it is all right to let students bring the bottles to the “Window” when they actually run out. Be sure the student brings the empty bottle with them. If they do not have a bottle, the prep room will assume the bottle is just in use and the students did not look for it and will send them back to the lab.

It is always important that you have attended your AI meeting and the lab lecture, so you are aware of the policies and procedures that the course professor expects to be enforced. Typically, you will let your students into class, collecting any assignments that are due as they enter. You should also inspect the students’ clothing and make sure it meets the requirements of the safety agreement. While in lab, everyone (students, AI’s, Instructors, lab personnel) must wear chemistry safety goggles at all times. Do not allow students into the lab unless they are actually wearing their goggles.

You should always plan to start your class with a short, pre-lab lecture. At a minimum, this should include safety precautions specific to the day’s experiment. Unfortunately, many students will have skipped the lab lecture and not be aware of potential dangers. You can also go over tricky steps of the procedure or any calculations they will need to do during the lab period. The pre-lab lecture should only be 10-15 minutes long. After you have finished, then allow them to begin the lab. A word of caution: if you have collected assignments due at the start of class be sure to keep them in a

safe and secure location. Otherwise, students may be tempted to retrieve their assignments and change or complete them when you are not looking.
During the lab period, you should be constantly circulating through the room. Do not grade assignments, read the literature, or surf the web while you are teaching lab. Observe the students, answer simple questions that they might have. Do not allow one student or group of students to monopolize your time and attention. During this time, keep an eye on the waste bottles. When they have reached the full line, send a student to the prep room to ask the staff to bring a new bottle. If the bottle over- flows, it will be YOUR responsibility to remediate the waste-not the prep rooms.

Documentation of items on the checklist will need to be marked as completed at the end of the lab period. Assign these tasks to the students as they finish the experiment. Do not let any students leave without having performed one of the cleanup procedures from the checklist. If you do not re- quire the students to complete these tasks, it will be your responsibility to perform all of them. Turn in the checklist to the folder in the back hall when your class is over.

The First Day of Lab

All AI teaching labs have a special responsibility on the first class session. All IU undergraduates MUST sign a safety agreement for every chemistry class that they take. The safety agreement governs appropriate dress and behavior of students while in the lab. No student should perform ANY work in the lab without completing a signed safety agreement. It is your responsibility as a laboratory AI to go over the points of the safety agreement with the students. Point out where in the room specific safety equipment such as showers, eyewashes, and fire extinguishers are located to the students as well.

Only students who are officially registered may enter/participate in the lab. Do not allow wait-listed students in lab.

Every student in a chemistry lab MUST have completed the online safety quiz before being allowed to work with any glassware or chemicals. The last step of the quiz is an electronic signature, which has replaced the paper form. If your class is working in the lab on week one, you have to check that students have completed the quiz BEFORE you arrive at your lab section. Any student who has not completed the quiz or has checked the “No I don’t agree to follow these rules” button cannot do any work or even be allowed in lab. The quiz is located in the University’s classroom information system called CANVAS. Your instructor may have you make the quiz accessible from your individual lab sections page or may manage the safety agreement from the lecture sections page.

Chemistry Safety Agreement

1. Eye Protection

Eyes are especially vulnerable in a chemistry laboratory. Approved splash protective safety goggles MUST BE WORN AT ALL TIMES. Failure to do so can result in IMMEDIATE EXPULSION from the lab and an unexcused absence for that experiment.

Safety Goggles CAN NOT be borrowed from the Laboratory Stockroom or the Academic Office.

Eye injuries, whether chemical or mechanical, must always be considered serious. The laboratory instructor should be alerted immediately. The best procedure in case of chemical injury to the eye is immediate and pro- longed (15-20 minutes) flushing with water. Eyes must be forced open to be washed well. Contacts should be removed as soon as possible in order to properly flush the eyes.

2. Protective Clothing

Shoes must cover the entire foot; this includes the heel and the top of the foot up to the ankle. Bare feet and any type of open shoe or sandal may not be worn in chemistry laboratories. Socks are to be crew length (over the ankle) or longer. Fabric and athletic shoes offer little protection from chemical spills and are discouraged. Shoes of leather or watertight construction are recommended.

Shorts, Capri pants, skin-tight pants (e.g., leggings, Jeggings, exercise pants, etc.), mini-skirts, sleeveless shirts, and bare midriffs are NOT PERMITTED. Pants, skirts, and dresses must cover the leg to the ankle. When wearing boots your pants or skirt **MUST** go over the top of the boot. There have been significant injuries when chemicals have fallen into a boot and gone unnoticed for several hours.

Hair that is long enough to be tied back should be pulled back and kept away from the face.

Gloves are provided for those experiments that require them. When gloves are exposed to a chemical, they should be removed and replaced with a new pair. Students should remove their gloves prior to using the computer keyboard or mouse, touching personal items, or before leaving the laboratory at any time.

3. Injuries

In case of minor cuts and burns, students should report them immediately to their instructor. Minor first aid treatment can be given within the building. If a minor injury requires medical attention, contact the stock-room staff.
If a person is seriously injured, no attempt should be made to move the person unless necessary, such as in the case of a fire. Call 911 immediately and alert the stockroom staff. The instructor should be alerted and should send someone to meet emergency personnel outside. Someone should stay with the injured person until help arrives.

4. Medical Expenses

Except in very unusual circumstances, all medical claims are the responsibility of the student. This includes the case of emergency ambulance transportation and emergency room treatment. Health Insurance cover- age by a family plan or individual student is strongly encouraged.

5. Fire

Each student should familiarize him/herself with the location and proper use of the fire extinguishers and fire blankets. Should a fire alarm sound while you are working in the lab, turn off any gas valves, hotplates & equipment that are in use and leave the building by the nearest exit. Go to your lab section's designated meeting area inside Ballantine Hall, or across the street by the Union and stay with your classmates until your instructor can take a head count and give you appropriate direction.

If a person's clothing catches fire, the first thing to do is throw the individual to the floor and roll them over several times to smother the flames quickly or cover them with a fire blanket. Never let them remain in a standing position even if you must trip or knock them down; this will help prevent injury to the respiratory passages and the eyes by flames, which would naturally rise and envelop the head.

Never turn a fire extinguisher of any type on a person. Eye injury may result from a dry chemical type or frostbite from the "snow" of the carbon dioxide type of extinguisher. Do not use the safety shower to extinguish a person on fire. Fire blankets are available in the laboratory to help extinguish the fire.

6. Chemical Spills

For most chemical spills on a person's skin, rinsing with plenty of running water (for at least 15 minutes) is the best first aid treatment. Rapid and immediate treatment is essential. Use lots of water; a little water or a damp cloth may be worse than none because of the heating effect of water with acid or alkali materials. The safety shower is intended to be used in case corrosive and/or toxic chemicals are spilled or splashed over a large body area and must be washed off rapidly. Clothing soaked with strong acid or alkali or a toxic chemical should be removed. This is no time for modesty. Spills on laboratory benches, floors, in fume hoods, and other laboratory areas must be cleaned as soon as possible after they occur. In the case of any chemical spill, alert your laboratory instructor immediately. For hazardous materials, a chemical spill kit is available for you and your AI to use in cleaning the spill. Do not use the spill kit without your AI's supervision.

7. Chemical Odors

EXERCISE GREAT CARE IN NOTING THE ODOR OF FUMES AND AVOID BREATHING FUMES OF ANY KIND. If notation of chemical odor is required for an experiment, waft the vapors toward the face while keeping the vessel at a distance.

8. Personal Safety

Do not eat, drink, smoke, or chew gum or tobacco in the laboratory. Smoking is prohibited anywhere on the Indiana University campus. Keep backpacks, coats, etc. away from the lab benches and out of the aisles. Do not sit on lab benches. Wash your hands before leaving lab. Cell phones and personal music devices are prohibited in the laboratories for sanitary and safety reasons.

9. Waste Disposal

Most chemicals cannot be poured down the drain. Students should ask their instructor for directions regarding the disposal of chemicals. Cracked or chipped glassware should be taken to the Prep Lab Service Window as soon as discovered where replacements can be obtained. Broken glassware, disposable glassware, and anything with a sharp edge or point must be placed in the white plastic buckets labeled NONHAZARDOUS SHARP WASTE. Disposable glassware must be rinsed before being discarded. Non-disposable glassware must be washed and dried before returning it to the appropriate storage locations for the safety of other students. Consult with your AI if you do not know if glassware is to be discarded.

10. Health Concerns & Pregnancy

Students who are pregnant are discouraged from taking a chemistry lab course because of the potential for chemical exposure. The course can be dropped before the end of the first week at no cost to the student or if pregnancy occurs during the semester, an incomplete can be given. In either case, it is important that the instructor of the lab course be informed at the earliest opportunity. Persons with severe allergies or sensitivities, heart ailments or a seizure condition should check with a physician before taking a chemistry laboratory course and notify the AI and the professor of their condition.

Please note that failure to follow safety protocols yourself or to enforce them among the students in your class can lead to probation.

AI Post-Lab Checklist: Under Grad Labs

To be completed before you leave at the end of your lab section!

Duty	Completed
List Cleanliness/Reagent Status/etc Issues from Previous Section(s) on Back	
Ensure Reagent/Solvent/waste Bottles Capped With Correct Caps	
Return All Reagent Bottles to the Reagent Hood	
Ensure that the Reagent Hood is Tidy	
Clean All Equipment and Return to Original Location	
Bring Empty Solu[illegible]hemical Bottles to Stockroom for Refills	
Empty All Trap W[illegible]te Into [illegible]aste Container and Reassemble	
Turn Off Lights in All Ho[illegible]s and Close Sashes	
Check UV/Vis Spectrometer fo[illegible]uvettes	
Check Balance Room for Misp[illegible]ced [illegible]ents and Return to Reagent Hood	
Ensure Gas Valves are Turned Off	
Ensure All Water Faucets Have Been Tur[illegible] Off	
Ensure All Hot/Stir Plates and Heating Mantles ar[illegible], cool, and in Proper Place. **If still hot, leave out.	
Ensure Balances and Balance Area Are Clean	
Throw Away Any Trash Left Around Lab	
Turn in Any Lost and Found Items to 032, if They Belong to Your Students Please Keep Them and Email Them	
Inform Stockroom Of any Issues	
Make Sure ALL Counter Tops are Wiped Down	

EXAMPLE

*Please initial after each duty has been fulfilled. Not all duties may be applicable for every lab period. In these cases, please mark the "Completed" column with an "N/A."

Thank you for your help in keeping the lab areas clean and organized for your fellow AIs and stockroom attendants.

Room_____ Class_____ Lab Day/Time_____

AI Name_____

AI Signature_____ Date_____

If there are any issues with the lab when you arrived please note these issues on the back of this form in detail.

AI Post-Lab Checklist: Org. Teaching Labs

To be completed before you leave at the end of your lab section!

Duty	Completed
Cap All Reagent/Solvent Bottles With Correct Caps and Place in the Reagent Hood	
Clean and Tidy Reagent Hood	
Return Cold-Stored Chemicals to the Stockroom Window	
Bring Empty Solvent/Chemical Bottles to the Stockroom Window	
Unplug Rotavaps & Pumps. Empty Rotavap Solvent Traps	
Clean Balances & Balance Area	
Turn Off TLC UV-Lamp	
Unplug Mel-Temps and Remove Abandoned T[illegible]	
Place Abandoned Glassware in the Misplaced Glass[illegible]	
Ensure All Hoods are Tidy and Clean	
Return All Hot/Stir Plates and Heating Mantles to Their Proper H[illegible]ds	
Turn Off Lights in All Hoods & Close Sashes	
Ensure Gas Valves are Turned Off	
Ensure All Water Faucets Have Been Turned Off	
Throw Away Any Misc. Trash Left Around Lab	
Return Misc. Items to Cabinets/Drawers	
Check For & Remove Glass Items from Waste Bin	
Cap Waste Bottles	
Clean IR/UV-Vis Area. Place Clean Salt Plates in Desiccator.	
Empty & Rinse Polarimeter Cell. Turn Off & Unplug Polarimeter.	
Check NMRs For Abandoned Samples. Place Solvent Standards in NMRs and Put in Standby Mode.	

EXAMPLE

*Please inital after each duty has been fulfilled. Not all duties may be applicable for every lab period. In these cases, please mark the "Completed" column with an "N/A." Thank you for your help in keeping the lab areas clean and organized for your fellow AI's and stockroom personnel.

Room_____ Class_____ Lab Day/Time_____

AI Name_____

AI Signature_____ Date_____

[redacted]

Emergency Preparedness

Medical

Medical emergencies can happen anywhere, and they are not limited to teaching labs. Students are as likely to have a seizure or pass out in a discussion section as they are in a lab. Having thought about these situations and having a plan is always good preparation. In labs, send a student to get help from the lab staff in the prep room. They can assess the situation and place a call for an ambulance. In a discussion section, you will likely be on your own deciding what to do. When in doubt, call 911. You should call 911 anytime a student loses consciousness. The student can always refuse the trip to the hospital if they revive before the ambulance arrives. Just be aware if you call from your cell phone you will connect directly with the city/county dispatch, and they will not be able to tell from the phone information where you are. Stay calm and give very clear directions as to what building, floor, and room you are in. If your room has an IU phone in it, your call will go to the campus police department. They should be able to tell in what room you are located. Again, give a clear description of what has happened.

Weather

Indiana is a state that gets tornadoes and other severe weather conditions. Most rooms will not have a weather radio and you cannot count on being able to hear a warning siren inside a building. The university has a system for sending out emergency notifications to cell phones and email called IU-Alert. It can take a while for 40,000 people to receive a notice. If you find that there is a tornado warning you should move your students to a designated tornado shelter in the building, you are teaching in. For Labs in the chemistry building all labs except C027, C149, and C133 are tornado shelters. In these three rooms, you should move your students to one of the designated hallways. If you are not familiar with the system used in the United States, a Warning is issued when a threat is imminent. A Watch is issued when conditions are correct for the possible formation of a tornado.
You do not need to take any direct action if a Watch has been issued.

Fire

In the event of a fire alarm, evacuate your students to a designated location outside and away from the building. You should know how many students you had in your room and do a head count at the gathering location. Every building has evacuation routes listed for each floor. Find yours and follow them. In the event of a fire alarm, every building has floor wardens who will be assisting with the evacuation. Follow any specific directions you are given. You should always assume alarms are real, and you should never stay in a building with a fire alarm that has been activated. In the chemistry building, we insist that students move well away from the building, across the street to the IMU sidewalks. In other buildings, you should plan to move an equal distance away.

Other

Currently you should be prepared for other situations that might occur on campus. IU-Alerts will again be activated should there be a known threat on campus. Generally, the response in these situations is to Shelter in Place. If the activity is in your building, do what you can to prevent being a target; turn off the lights, stay out of view from the doorway, and keep quiet. The doors to the chemistry labs are locked in part to prevent unauthorized people from entering the rooms easily.

INDIANA UNIVERSITY

DEPARTMENT OF CHEMISTRY

Associate Instructor Agreement

I, _____, have read and agree to the following

(Print your name)

terms of my Associate Instructor appointment within the Indiana University Department of Chemistry.

The department considers the safety of students to be of primary importance in our mission of education. This includes both the physical as well as the psychological and emotional safety of our students. Therefore, I agree to:

1) follow all safety rules as outlined in the Laboratory Safety Agreements, the "Associate Instructor's Manual", and the Department of Chemistry "Safety and Chemical Hygiene Plan". This includes wearing goggles whenever I am in the laboratory, wearing appropriate clothing, providing proper disposal of all chemical waste, and using gloves to handle chemicals when appropriate.
2) providing a safe classroom environment for my students by following the principles outlined in the Indiana University "Code of Student Rights, Responsibilities, and Conduct", the "Associate Instructor's Manual", the Indiana University "Code of Academic Ethics", and other university policies as outlined in the "Schedule of Classes and Student Academic Information". I have the obligation to report any violations of these policies as outlined in these documents.
3) protect student privacy with respect to their educational records and I have successfully completed the on-line FERPA tutorial, https://ferpa.iu.edu/
4) **(once you complete the FERPA tutorial forward a copy of the confirmation email to Dalane Anderson dga@indiana.edu.)**

In addition, I am expected to:

1) attend all lectures and other course meetings as requested by the faculty.
2) hold regular office hours as agreed to at the beginning of the semester. It is my responsibility to find a replacement if I am unable to meet my obligation and inform the Undergraduate Office.
3) proctor and grade examinations as assigned by the Undergraduate Office. It is my responsibility to find a replacement if I am unable to meet my obligation and inform the Undergraduate Office and the faculty member.
4) grade, record grades, and return materials to students in a timely fashion as required by the course instructor.

Any member of the faculty or departmental staff have the authority to enforce and report any violations of the above regulations. I understand that failure to follow these rules can result in verbal and/or written warnings, being placed on AI probation, loss of AI stipend, with immediate dismissal from the program.

Signed,

_____ _____

Signature Date

_____ _____

Printed name Student ID#

EXAMPLE

Family Educational Rights and Privacy Act
FERPA

WHAT IS FERPA?

In an effort to protect student privacy with respect to their education records, the federal Family Educational Rights and Privacy Act (FERPA), commonly referred to as the Buckley Amendment, was enacted in 1974. Any educational institution that receives funds from the U.S. Department of Education must comply with the Act. In compliance with that regulation, Indiana University, by action of the Faculty Council (March 29, 1977, amended October 2, 2001), instituted the Release of Student Information Policy. FERPA grants four specific rights to the student:

- The right to see the education records that the institution is maintaining on the student
- The right to seek amendment to those records and in certain cases append a statement to the record
- The right to privacy with respect to disclosure of the education records
- The right to file a complaint with the U.S. Department of Education Family Compliance Office

WHAT DEFINES A STUDENT EDUCATION RECORD?

Just about any information related to the student and maintained by the University for use in the education process is considered a student education record including:

- University identification number (SSN or random ID number)
- Personal data
- Enrollment records
- Grades
- Class schedules

Examples of a student education record include:

- A document in the registrar's office
- A computer printout in your office
- A class list on your desktop
- A computer display screen
- An electronic file received as an attachment

WHAT ARE THE BASIC RULES?

Once a student begins attending an institution of post-secondary education, all privacy rights move to that student (away from the parents). The general principle is that student education records are considered confidential and may not be released to third parties (including parents) without the written consent of the student.

As a school official, you have a responsibility to protect all education records in your possession. You have access to private information only for legitimate use in completion of your responsibilities as a university employee. Casual access for personal reasons or "just out of curiosity" is a FERPA violation.

If you are ever in doubt about what may be released, err on the side of caution. Do not release any information until you contact your course professor or the Office of the Registrar at (812) 855-0121. The Office of the Registrar is responsible for student record information that is maintained in the academic record.

SPECIAL "DON'TS" FOR FACULTY (Including AI's) to avoid violations of the FERPA regulation:

- DO NOT display the university identification number (SSN or random ID number) of a student in a public posting of grades
- DO NOT link the name of a student with that student's university identification number in any public manner
- DO NOT leave graded tests or papers in a stack for students to pick up
- DO NOT circulate a printed class list with student name and university identification number as an attendance roster
- DO NOT provide anyone with lists of students enrolled in your classes for any commercial purpose
- DO NOT provide anyone with lists of students enrolled in your classes for any research purpose without the written consent of the student

FERPA Tutorial

The tutorial is designed to give you a base level knowledge of the rules governing access to and release of student information. As part of your Chemistry AI agreement, you must complete the on-line FERPA Tutorial: http:// ferpa.iu.edu (once completed, forward the completion email to Dalane Anderson; her email is dga@indiana.edu)

Indiana University's Annual Notification of Student Rights under FERPA

The Family Educational Rights and Privacy Act (FERPA) affords students certain rights with respect to their education records. These rights include:

1. The right to inspect and review the student's education records within 45 days of the day the University receives a request for access. A student should submit to the registrar, dean, head of the academic department, or other appropriate official, a written request that identifies the record(s) the student wishes to inspect. The University official will make arrangements for access and notify the student of the time and place where the records may be inspected. If the records are not maintained by the University official to whom the request was submitted, that official shall advise the student of the correct official to whom the request should be addressed.
2. The right to request the amendment of the student's education records that the student believes are inaccurate, misleading, or otherwise in violation of the student's privacy rights under FERPA. A student who wishes to ask the University to amend a record should write to the University official responsible for the record, clearly identify the part of the record the student wants changed and specify why it should be changed. If the University decides not to amend the record as requested, the University will notify the student in writing of the decision and the student's right to a hearing regarding the request for amendment. Additional information regarding the hearing procedures will be provided to the student when notified of the right to a hearing.
3. The right to provide written consent before the University discloses personally identifiable information from the student's education records, except to the extent that FERPA authorizes disclosure without consent. The University discloses education records without a student's prior written consent under the FERPA exception for disclosure to school officials with legitimate educational interests. A school official is a person employed by the University in an administrative, supervisory, academic or research, or support staff position (including law enforcement unit personnel and health staff); a person or company with whom the University has contracted as its agent to provide a service instead of using University employees or officials (such as an attorney, auditor, or collection agent); a person serving on the Board of Trustees; or a student serving on an official committee, such as a disciplinary or grievance committee, or assisting another school official in performing his or her tasks. A school official has a legitimate educational interest if the official needs to review an education record in order to fulfill his or her professional responsibilities for the University. Upon request, the University may disclose education records without consent of officials of another school in which a student seeks or intends to enroll. Finally, "public information" may be released freely unless the student files the appropriate form requesting that certain public information not be released. This form is available at the Office of the Registrar. Public information is limited to name; address; e-mail address; phone; major field of study; dates of attendance; admission or enrollment status; campus; school, college, or division; class standing; degrees and awards; activities; sports; and athletic information.
4. The right to file a complaint with the U.S. Department of Education concerning alleged failures by Indiana University to comply with the requirements of FERPA. The name and address of the Office that administers FERPA is:

   Family Policy Compliance Office
   U.S. Department of Education
   400 Maryland Avenue, SW
   Washington, DC 20202-5901

SOME COMMENTS FOR ASSOCIATE INSTRUCTORS BASED ON MY OWN EXPERIENCES AND OBSERVATIONS

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For those individuals who enjoy teaching or who aspire to be teachers-and for those who expect to pursue a career where interactions with others are sure to occur-being an Associate Instructor is an incredibly valuable and enriching experience. Being an Associate Instructor teaches you a lot about yourself and a lot about how to interact and communicate with others. You will learn to be tolerant, resourceful, and innovative.

Important Roles, Responsibilities, and Attitudes of an Associate Instructor (Teacher)

Someone has said that the role of a teacher is to teach students to teach themselves. What are the ways in which an Associate Instructor can set about trying to reach this lofty goal? Below, hopefully, are some answers to this profound question that are based on quite a few years of personal observations, experiences, and mistakes.

1. **Benefit from your own experiences as a student**

Recall your own experiences as a student in a class headed by an inexperienced teacher (a graduate student or a young faculty member). Try to remember what was good and what was bad about both the class and the instructor's performance. Think deeply and constructively about how to take advantage of the good points you remember and how to avoid the bad points you remember.

2. **Benefit from lectures that you attend**

In much the same vein as the preceding point, when you attend a lecture-and you are not so much concerned with taking detailed notes about the content of the lecture for some later examination- spend a little time, as you are listening and observing, just thinking about and analyzing the style of the lecturer. Does that individual speak to the audience, or spend most of the time facing the blackboard or screen? Are visual aids (slides, overhead transparencies) useful and intelligible, or have they been quickly and sloppily prepared? Does the speaker give you enough time to see and understand the visual aids, or does the lecturer race through a seemingly infinite number of visual aids? Does the speaker write legibly and allow time for the audience to hear, see, and write down pertinent points? Is the speaker enthusiastic? Does the speaker speak audibly and clearly? Are there good things about that lecture you could use in one of your own lectures? As someone interested in teaching, I frequently find myself analyzing the lectures and lecturing styles of visiting speakers in these ways.

3. **Acting as an interface**

As an Associate Instructor and an essential part of a teaching team, you are the interface between students and professors. You must understand, support, and reinforce the professor. You must not undermine (even unintentionally) the way the course is presented by the professor by making some casual or offhand remark to your students about the way the course is proceeding or not proceeding. On the other hand, you can often help the professor immeasurably by reporting to him or her what you are experiencing as an Associate Instructor and where your students are encountering difficulty. Acting effectively as a team, one or more Associate Instructors and a professor should be working toward the same common goal-the presentation of the best possible lecture or laboratory course.

4. **Punctuality**

Because you are responsible to and for your students, you must be punctual. This means that you want, if anything, to be early to your class or laboratory meeting. Being early permits several good things to happen. First, students immediately perceive that the class is important to you, and consequently it becomes more important to them. Second, in arriving early, you can actually do a bit of mingling with early-arriving students to sense their concerns and questions, and to learn their names. Third, on occasion, you will discover that the previous instructor has left the room or laboratory in some disarray that, by being early, you can correct. Fourth, by arriving early, you have a chance to layout your notes and materials, to catch your breath, and to collect your thoughts for an effective beginning.

5. **Preparation**

Preparation before arriving at the lecture room or the laboratory is crucial. You know from your own social experiences that first impressions are all important. Similarly, the first lecture or two, or the first laboratory experiment or two, of a semester set the tone for the entirety of that semester. You can win over your students with good initial performances and then continue to reap those benefits, or you can bomb out at the beginning of the semester and perhaps never gain the goodwill of your students. Moreover, you can never let down in being well prepared. You must be well prepared for overseeing laboratory experiments, which (ideally) means you have actually practiced or rehearsed every experiment, so you know it backward and forward. You must be well prepared to work problems, which means actually doing completely the assigned problems and probably as many other related problems as possible; moreover, you should be so familiar and comfortable with working the problems that you do not need to rely upon someone else's answer key. Associate Instructors who find themselves leading discussion sections have a particularly demanding responsibility, where preparation is of utmost importance. Among other things, these individuals must be able to work all assigned (and unassigned) problems, to answer questions about the lectures of the professor-in-charge, and to answer questions about other topics of the course-all of these being done readily and with minimal (and, hopefully, without) error. One way-and, I think, the best way-to aid your preparation is by attending all of the lectures or laboratory discussions offered by the professor. Of course, you have probably heard most (if not all) of the material before, but the point is that you will be getting a review of the material and you will see what is being emphasized, what is being omitted, what is being assumed, and how certain kinds of problems are being solved-so you will be able to prepare yourself better for the questions that your students ask. Another way to prepare yourself for teaching is to visualize yourself actually working with a group of students. If you will be leading a discussion section, find out where the room is located and visit the room in advance; learn how the blackboards and lights operate, and see if facilities for overhead transparencies or computers are available. Then spend some time visualizing how you would use the room and the facilities effectively. These actions can do a great deal to minimize the inevitable anxiety that precedes the first class meeting of every semester-those first-day jitters that seem to resurface no matter how many years you have been a teacher.

6. **Be in contact with your class (students)**

Speak to your students; be sure that you engage their attention when you speak. Speak clearly and audibly and avoid jargon. Experts in presenting technical or scientific material have concluded that no more than 100- 120 words per minute should be spoken; this seems like an unbelievably slow pace, but it is essential for the hearing and comprehending of such complex material, and to speak much faster will only lose your audience. Try hard to integrate your students into the presentation of material by soliciting their questions and then responding meaningfully to those questions. Learn the names of your students as quickly as possible.

7. **Admit ignorance**

Eventually, a student will ask a question that you cannot immediately answer. In such a case, the best thing to do is admit that you do not know the answer. However, it is then essential to do one of two things. First, you can inform the student that you will seek the answer and that you will provide an answer as soon as possible; then, as quickly as you can, consult appropriate books or colleagues to obtain the answer, and report back to the student. Second, and an approach I tend to prefer, is to have the student go with you to your bookshelf or to the library to seek out the answer; in this second scenario, it is best not to take the student with you when you consult with a colleague, because at times you can look rather stupid when a colleague informs you of what might be obvious to him or her but not to you. In addition, working in the library with a student teaches that student how to use the library and how to be resourceful-and those are good things. Finally, as stated earlier, you want to be well prepared so that you do not have to admit your ignorance very often.

8. **Seriousness and professionalism**

These attributes are obvious traits of a true teacher-scholar. You must take your subject seriously and you must behave professionally, if you are to gain credibility with students. If you exhibit these qualities, your students will too, and they will be apt to work harder and to show more commitment. However, exhibiting these qualities does not mean that you should be an individual without humor or compassion.

9. **Do not talk down to or belittle students**

Talking down to students creates an atmosphere in which the Associate Instructor seems to know everything and in which the students know little or nothing. Instead, it is incumbent upon an Associate Instructor (or a professor) to treat students as young colleagues and to nurture an environment in which instructor and students together are on a collective quest for knowledge. It is catastrophic to student morale if an Associate Instructor (or professor) tells students or otherwise makes them think that they are inferior and stupid. You will never profit from announcing that a particular student question is stupid or that the student is stupid. Although students certainly do not know everything and certainly have much to learn-as we all do-your challenge as an Associate Instructor (or professor) is to advance the students' knowledge and their abilities to learn and to teach themselves. Finally, never criticize or belittle a student in the presence of his or her peers; if you have some critical matter to discuss with a student, ask him or her to see you privately during your office hours.

10. **Attitude**

Behave as if you are important and treat your students as if they are even more important. Believe, and demonstrate by your behavior and actions, that what you are doing is very important, and you should find that your students will take the same attitude.