CHEMISTRY 399 - UNDERGRADUATE RESEARCH
CHEMISTRY 499W - UNDERGRADUATE RESEARCH AND REPORT WRITING
PROJECT INFORMATION SHEETS

Chemistry 399 and 499W are variable credit courses intended for upper-division students. They are offered on a Credit/No Credit basis, and students should have at least a 3.0 chemistry gpa. **A maximum of 12 credits each of 399 or 499W can apply toward degree credit requirements.** After a student has approval to register from a Faculty Supervisor, faculty entry codes may be obtained in the Chemistry Advising Office, Bagley 303 or via email at advisers@chem.washington.edu. When approaching faculty to discuss pursuing research, determine whether writing will be a component of the research. ***If writing is NOT required, students should register for CHEM 399. If report writing IS required, students should register for CHEM 499.***

Professor	Field	Required Background	Type of Work Involved
C. Campbell 227 BAG 543-3287 charliec@uw.edu	Physical chemistry/clean energy technology	Open	Solving surface science problems related to more efficient energy utilization and to environmentally cleaner chemical processes, especially in catalysis and electrocatalysis
C. Chatterjee 152A BAG/204L CHB 543-2349 chatterjee@chem.washington.edu	Biochemistry/organic/synthesis	General and organic chemistry (laboratory course useful), some biochemistry preferred. Desire to learn by working hard; minimum time commitment required is 15 hours per week for at least 4 quarters.	Synthesis of non-natural amino acids, peptides and proteins; applied to studying enzymes involved in human diseases - **preference given to students seeking honors thesis project.** Monthly written reports of research progress will be required at the end of every month.
D. Chiu 209 BAG 543-1655 chiu@chem.washington.edu	Bioanalytical/biophysical	Strong motivation	Optical instrumentation, microfabrication, biochemistry, point of care diagnostics.
B. Cossairt 404K CHB cossairt@chem.washington.edu	Inorganic and materials chemistry/nano-technology/synthesis	General chemistry and a strong interest in inorganic chemistry; minimum commitment of 3 quarters at 12 hours/week	Synthesis, reactivity studies and characterization (spectroscopy, electron microscopy, X-ray diffraction, electrochemistry) of inorganic molecules and materials

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C. Craig 202C BAG cfcraig@uw.edu	Chemistry Education	Successful completion of general chemistry; interest in diversity, equity, and inclusion (DEI) in STEM fields; interest in the psychology of learning; available to dedicate at least 6 hours/week for at least two quarters. Preferred Background: programming skills, especially with a scripting language like python or R, or willingness to learn same.	Developing curricular materials that address DEI issues in the teaching of chemistry, and assessing their impact. Statistical analysis of student performance in general chemistry in response to targeted teaching interventions, as mediated by students' prior academic attainment and demographics. Analysis of themes mined from student responses to open-ended questions on exam reflection surveys. Adapting educational taxonomies of knowledge and cognitive processes to chemistry.
G. Drobny 126 BAG 685-2052 drobny@chem. washington.edu	Physical	Full year organic and physical chem; some biochemistry; senior standing in chemistry	Studies in nuclear magnetic resonance; computer simulations of NMR experiments; structural problems in biopolymers; synthesis of isotopically labeled biopolymers; design and fabrication of analog and digital circuits
D. Fu 159 CHL 616-5691 danfu@uw.edu	Bioanalytical/ Biophysical chemistry	Strong motivation; Expect to work 15 hours/week for three quarters	1. Precision chemical measurements of cell and tissue; 2. Optical instrumentation and programming; 3. Cancer diagnosis and drug imaging.
D. Gamelin 204K CHB 685-0901 gamelin@chem. washington.edu	Physical / inorganic / materials	Flexible. CHEM 455, 456, 457 and/or CHEM 317 strongly recommended (concurrent registration is okay).	Spectroscopic studies of transition metal and rare earth metal ions in inorganic nanoscale materials; research entails inorganic synthesis, spectroscopy, calculations, and analysis
D. Ginger 213 BAG 685-2331 ginger@chem. washington.edu	Physical and materials chemistry/ Nanotechnology/Renewable Energy	Desire to learn by working hard; minimum time commitment required is 20 hours/week for at least 4 quarters	COVID-19 update: We are currently offering only remote projects for undergrads. An interest in computer programming, especially Python, or a willingness to learn, would be an asset. Projects could range from solar cell modelling, to machine learning and big data analytics for image processing and analysis.
M. Golder 204H CHB goldermr@uw.edu	Organic/polymers	Strong interest in interdisciplinary organic/polymer chemistry, highly motivated & enthusiastic with a strong work ethic, completion of (or currently enrolled in) organic chemistry; minimum commitment of 10 hours/week for at least 4 quarters.	1. Synthesis of new small molecules and polymers 2. Reaction development and catalysis 3. Characterization of chemical, thermal, and mechanical properties of novel organic materials

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M. Khalil 210 BAG mkhalil@uw.edu	Physical/Inorganic/ Synthesis/ Spectroscopy	Strong background in general chemistry. A desire to learn and understand how chemistry research is performed outside of a class environment. Minimum time commitment required is 10-15 hours/week for 3 consecutive quarters.	1. Sample synthesis and characterization of small inorganic complexes. Characterization will involve NMR, FTIR and UV/Vis. 2. LabView and Matlab programming for instrument automation and data analysis.
R. Klevit K466A HSB 543-7099 klevit@u. washington.edu	Biochemistry/ biophysical	BIOC 440 or BIOC 450 series or concurrent registration; physical chemistry or concurrent registration.	Structure of proteins involved in human disease; protein ubiquitination; small heat shock proteins; NMR studies of proteins - **preference given to students seeking honors thesis projects**
J. Kovacs 304B CHB 543-0713 kovacs@chem. washington.edu	Bioinorganic/ organic synthesis	General chemistry; organic lecture and lab; CHEM 317 recommended	Synthesis of N - and S - containing ligands and their corresponding metal complexes as models for biological enzyme active sites
X. Li 307 BAG 685-1804 li@chem. washington.edu	Physical/ theoretical/ computational	Physical chemistry; interest in computer simulation and programming	Developing and applying electronic structure theories and ab initio molecular dynamics for studying properties and reactions in nanomaterials
L. Maibaum 307 BAG 221-3931 maibaum@chem. washington.edu	Computational/ Biophysical/physical	Familiarity with a computer programming language such as Python; solid math skills; CHEM 457 recommended	Setup, running and analysis of Molecular Dynamics computer simulations of chemical and biophysical systems, such as liquids, cell membranes or proteins.
D. Masiello 323 BAG 543-5579 masiello@chem. washington.edu	Theoretical/ computational physical chemistry/chemical physics	Physical chemistry at the level of CHEM 455; interest in mathematical and computational approaches to physical science	Theoretical modeling and numerical simulation in plasmonics, nanophotonics, and quantum optics
F. Michael 404H CHB 543-6519 michael@chem. washington.edu	Organic/ organometallic	Through CHEM 239 or 337 and CHEM 242 or 347	Development of new reactions; organic synthesis; studies of mechanisms

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P. Rathod 192 BAG 221-6069 rathod@chem. washington.edu	Biorganic, genomics, microbiology	A very strong academic record; dedication to develop research skills; initiative and creativity. Early Honors students with long-term research interests will get high preference	Malaria biochemistry, pharmacology, and genomics in the Seattle lab, and molecular support for malaria field-based studies in India.
B. Robinson 212 BAG 543-1773 robinson@chem. washington.edu	Physical / Theoretical / Materials	Either physical chemistry, or organic chemistry and laboratory, or computation experience	Our group examines the organization and self assembly of organic chromophores to design and develop materials that have large non-linear optical properties.
T. Sasaki 204E CHB 543-6590 sasaki@uw.edu	Organic/medicinal	Organic; some biochemistry preferred	Natural product chemistry; synthesis of analogues of bioactive natural products; development of novel therapeutics
C. Schlenker 296 Bagley 221-8627 schlenk@uw.edu	Physical/Materials/ Organic	Hard-working, self-motivated: minimum 15 hours/week in 4 consecutive quarters. CHEM 239 & 242 for synthetic projects. Concurrent enrollment in CHEM 455 strongly recommended for photophysics	Synthesis, spectroscopy, and electrochemical characterization of organic and interfacial materials for energy conversion and storage. Small-molecule organic synthesis and coordination chemistry. Ultrafast photophysical and time-resolved photochemical characterization. Device design, fabrication, and characterization for solar energy conversion and storage applications such as solar cells and batteries.
S. Stoll 227 Bagley 543-2906 stst@uw.edu	Biophysical	Strong motivation and a good work ethic; physical chemistry and biochemistry coursework desirable, but not required	Sample preparation and EPR spectroscopy measurements on proteins, peptides, transition metal complexes and organic radicals to elucidate their structure; computer simulations of molecules (Matlab and others); - **students need to commit to 15 hours/week for at least 3 quarters.**
R. E. Synovec 149 CHL 685-2328 res9@uw.edu	Analytical	Through organic chemistry and CHEM 321; current or previous enrollment in CHEM 429 is recommended	Gas chromatography and application of computers to chromatographic studies
A Theberge 225 BAG 685-2330 abt1@uw.edu	Analytical/Biological Chemistry Biomedical Science & Engineering	Strong motivation, desire to do collaborative research; minimum time commitment of 15 hours/week for 6 quarters.	Our group develops microfluidic technology to study a wide variety of disease pathologies, as well as human-microbe interactions. We apply basic chemistry and biology concepts to our fluidic technologies in an effort to simplify and model complex biological systems. Research includes engineering/fabrication, computer aided design, fluid mechanics, surface chemistry, cell culture, and metabolomics.
F. Turecek 218 BAG 685-2041 turecek@chem. washington.edu	Analytical/organic	Strong motivation; willing to work in lab 12 hours per week for three quarters; through organic chem and CHEM 321; physical chemistry helpful	Development of mass spectrometric techniques; organic and bioorganic structural analysis; chemistry of transient radicals; atmospheric radicals

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G. Varani 63C BAG/220 BAG 543-7113 varani@chem. washington.edu	Biological, medicinal and biophysical chemistry	Course in biochemistry and/or chemistry; students must commit to at least three quarters; preference will be given to students seeking honors thesis project	Discovery and pharmaceutical development of new small molecules and drug targeting oncogenic RNA and viral RNA (flaviviruses and coronaviruses); structure and function of non coding RNAs in cancer and other human diseases
A. Velian 304C CHB 616-5179 avelian@uw.edu	Inorganic/Synthesis/ Nanomaterials/ Surface chemistry	Most important: Desire to learn by working hard. General chemistry and strong interest in inorganic chemistry (molecular or materials) encouraged. Minimum time commitment is 15 hrs/week for at least 4 quarters.	Synthesis and assembly of molecular inorganic clusters, surface functionalization of inorganic nanosheets, small molecule reactivity studies and catalysis, wide range of spectroscopic characterization techniques for both molecules and materials. Preference given to students seeking honors thesis project. Quarterly research presentation and report is required, as well as timely updates of ongoing experiments and observations using our electronic notebook.
D. Wiegand 213 BAG 543-1164 wiegand@uw.edu	Chemistry education	Good work ethic, enthusiasm for learning, successful completion of general chemistry	Investigation of the effectiveness of active learning strategies for chemistry courses. Includes qualitative and quantitative research methods
D. Xiao 304H CHB 543-4136 djxiao@uw.edu	Inorganic and materials chemistry	General chemistry, strong work ethic, enthusiasm, minimum commitment of 15 hrs/week for 4 quarters.	Design, synthesis, and characterization of new crystalline porous materials for applications related to energy and the environment. Students will receive training in synthesis (inorganic, organic, materials), characterization (spectroscopy, diffraction, gas sorption, electron microscopy), device fabrication, and catalysis
B. Zhang 209 BAG 543-1767, zhang@chem. washington.edu	Analytical, Neurochemistry, Nanoscale Electrochemistry	Strong motivation, willing to work in lab for 12 hours/week for three quarters	Electron-transfer chemistry, nanoscale electrochemistry, fluorescence microscopy of redox processes; neurotransmitters sensing in the brain; single molecules detection; very large electrochemical arrays, imaging of neuronal activity.