

**GLY 6932  
Instrument Methods**

**COURSE SYLLABUS**

Spring, 2023

INSTRUCTORS:  
George Kamenov  
Ann Heatherington  
Jason Curtis

Offices, email addresses, office hours, office phone:

George Kamenov – [kamenov@ufl.edu](mailto:kamenov@ufl.edu), 363 Williamson Hall, 846-3955, T  
9:30-11:30am and F 9-11am and by appointment

Ann Heatherington – [aheath@ufl.edu](mailto:aheath@ufl.edu), 107D Williamson Hall, 538-4330, Tues  
and W 10-12 AM and by appointment

Jason Curtis – [curtisj@ufl.edu](mailto:curtisj@ufl.edu), 372 Williamson Hall, 392-2296, M 9-11am and  
W 9-11am, and by appointment

Class hours – lecture from 9:35am to 10:25am in WH218 and individual work to be  
determined by instructors and individual students

Classrooms – 218 for lectures and the following Department of Geological Sciences  
research labs:

Ann Heatherington – 118, 120C and 304 Williamson Hall

George Kamenov – 302, 324 and 333 Williamson Hall

Jason Curtis – 330 and 336 Williamson Hall

Course credit – 1

Course section – 17H5

***It is advisable that the student already has a scientific project that requires the  
use of the analytical instruments in the Department of Geological Sciences  
before enrolling in the class. Consult the instructor(s) if you do not have a  
specific project but still want to take the class. In such cases a project will be  
assigned to you by the instructor(s).***

**GLY6932 Instrumental Methods Spring 2023 schedule**

***Room 218, Wednesday 9:35am-10:25am***

1/11/23 – Introduction to class, project for each student (Kamenov)

1/18/23 – Safety training for using the labs in the Department of Geological  
Sciences. (Heatherington)

1/25/23 – Mineral separation lab procedures (Heatherington)

2/01/23 – General X-Ray fluorescence theory (Heatherington)

2/08/23 – XRF sample preparation, instrumentation, and analysis (Heatherington)

2/15/23 – SEM sample preparation, instrumentation, and analysis (Heatherington)

2/22/23 – Clean Lab sample preparation for trace elements and isotopes for ICP-MS (Kamenov)

3/01/23 – MC-ICP mass-spectrometry instrumentation and Traditional and Non-Traditional Isotope analyses (Kamenov)

3/08/23 – ICP-MS elemental (major and trace) analyses, including standard selection and preparation, high-resolution work, errors, detection limits (Kamenov)

3/15/23 – No class, Spring Break

3/22/23 – Laser-Ablation MC-ICP-MS U-Pb dating of zircons and other U-Th minerals, data reduction with “CALAMARI” and “ISOPLOT”, concordia, standards, errors, detection limits (Kamenov)

3/29/23 – Stable Isotope mass-spectrometry instrumentation and analysis (Curtis)

In addition to the above lectures, individual work on selected individual projects throughout the semester - time determined by instructors and individual students and locations will be the Geological Sciences research labs.

- A. Description – This course is designed to train students in sample preparation and the use of one or more of the analytical instruments in the Department of Geological Sciences. These instruments include a scanning electron microscope (SEM), an X-Ray fluorescence spectrometer (XRF), an inductively coupled plasma-mass spectrometer (ICP-MS), a multi-collector inductively coupled plasma-mass spectrometer (MC-ICP-MS), and Laser Ablation ICP-MS, one of several stable isotope mass spectrometers and one of two laser based stable isotope analyzers. Students will learn to operate the instruments that relate to their individual projects.
- B. Course Objectives –The class will allow students to get one-on-one training how to prepare samples and perform analysis on the state of the art analytical instruments in the Department of Geological Sciences. While learning the instrument the students will be able to analyze the samples for their specific project.
- C. Course Topics – Laboratory work on student’s specific project samples.
- D. Textbook – none
- E. Course materials – sample preparation protocols will be provided by the instructors.
- F. Grading plan – Final grades will be assigned on the basis of the student’s work on the specific project.
- H. For students with disabilities - Students requesting classroom (lab room) accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must

then provide this documentation to the Instructor when requesting accommodation.

- I. Schedule for individual lab work to be determined between instructors and individual students.