

Wednesday 2:00PM-4:50PM

Room: 236N HM unless otherwise announced

Instructor: C. M. Taylor, Ph.D.  
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**Course Description:** Laboratory experiments in inorganic synthesis and spectroscopic methods in inorganic chemistry.  
Co-requisite- CHEM414

**Learning Outcomes:** Students will obtain practical experience in synthetic and instrumental techniques. Students will develop strategies for problem solving and self reliance. Students will learn how to prepare a proper research notebook. Students will learn to organize data and present their experimental results.

**Office Hours:** Posted within Blackboard under the button labeled "Office hours" and 239Na office door.

**Course Requirements:** (1) Student Laboratory Notebook, Top Bound, 50 Set, (Hayden- McNeil). (2) Lab Safety Glasses (3) A USB adaptable storage device such as a flash drive (4) The ability to access Blackboard (5) A usable VSU student e-mail address (6) Students are expected to provide all materials and funds needed for the presentation of a research poster.

**Contacting your Instructor:** VSU student e-mail is the best way to reach your instructor. If you do not know your e-mail address or have forgotten your password, call OIT. I will no longer accept non-VSU e-mail. I will expect students to read announcements in blackboard and read their e-mail daily.

**Attendance:** Attendance is required. Students must attend during their scheduled class period. There will be no "makeup" classes or assignments. There are no excused absences except mandatory school sponsored events. Do not send doctor's notes, obituaries or any other documentation for absences to the instructor. Mandatory school events require prior approval and an e-mailed notice from a VSU faculty member or official representative.

**Classroom Conduct:** Inappropriate classroom conduct is a violation of the **Student Code of Conduct** (Posted on the VSU Blackboard Site). Science laboratory classrooms inherently require **strict regulation of safety protocol** in addition to normal rules of behavior. See (A) Safety, (B) Lab Glasses and Clothing, (C) Tardiness/Attendance.

- (A) **Safety:** Students must sign a safety sheet and agree to the terms contained therein to participate in laboratory experiments. Random safety checks are run by the Chemistry Department Chair which could result in immediate expulsion of the safety violator.
- (B) **Lab Glasses and Clothing:** If a student forgets his/her safety glasses or is dressed inappropriately (see safety sheet), the student will not be allowed to enter the lab or complete the experiment. The student may not go home and change or go back to their dorm and retrieve their glasses. The purchase of lab glasses is the responsibility of the student. The University does not provide these glasses. Labeled glasses can be left in the advanced lab. LAB GLASSES MUST BE WORN ANY TIME THE STUDENT IS IN THE ROOM EVEN IF THE STUDENT IS JUST WORKING ON AN INSTRUMENT.
- (C) **Tardiness/Attendance:** Student tardiness distracts from the normal operation of the lab and leads to an environment that is not organized or safe. Students who are over 15 minutes late will be sent home. Student that are late but not sent home will receive a serious point deduction for the day.

Attendance in laboratory is required. Students must attend during their scheduled lab period. There will be no “makeup” labs or attending a lab at a different time other than scheduled. There are no excused absences except mandatory school sponsored events. Do not send doctor’s notes, obituaries or any other documentation for absences to the instructor. Mandatory school events require prior approval and an e-mailed notice from a VSU faculty member or official representative. Attendance at the Undergraduate Poster presentation is required. The student will arrange to makeup or take ahead of time any course material in other courses on March 28<sup>th</sup> during the poster session.

**Experimental Strategy:** Students can work alone or with a partner on the experiments listed in the scheduled activities. Students are required to complete a minimum of seven of the eight experiments and do not have to complete them in the order specified. The instructor will still present the topics on the days specified as “Theory and Practice”. Students may meet with the instructor by appointment for extra help. Students who complete seven instead of eight experiments do not meet fewer times. The extra time is allowed to expand on any one experiment. Students may work on experiments outside of and in addition to normal class time as long as a faculty member is in their office on the second floor.

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<i>Activities</i>			
Week	Notes	Topic	Quiz/test/deadline
Jan 15	Student will be introduced to the proper notebook format.	Theory and practice: Beer’s Law and using a UV/Vis Spectrophotometer.	None
Jan 22	Experiment 1	Problem Solving: Developing and Assay method for determining the concentration of an unknown Fe <sup>2+</sup> solution	None
Jan 29		Theory and practice: First order reactions, linear and non-linear fitting, collecting kinetic data.	Topic for poster selection. Abstract. Possible random check.
Feb 5	Experiment 2	Problem Solving: Dissociation Reaction of Ferroine in the Presence of Excess Nickel. Solvent Effects.	Possible random check.
Feb 12	Experiment 3	Ethylenediamine Complexes of Cobalt and Nickel. Obtaining IR (Mid and Near) and UV/Vis Data using diffuse reflectance accessory.	Possible random check.
Feb 19	Experiment 4	Problem solving: Conductivity of Ethylenediamine Complexes of Cobalt and Nickel	Possible random check.

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Feb 26		Theory and Practice: Crystal field Theory, Selection rules.	Rough Draft Poster Due.
March 5	Experiment 5	Synthesis of a Spectrochemical Series	Notebooks Collected
March 12		Break	NA
March 19	Experiment 5	Synthesis of a Spectrochemical Series- obtain spectroscopic data.	Possible random check.
March 26		Student required to present a poster.	Poster presentation
April 2	Experiment 6	Sol-gel method	Possible random check.
April 9	Experiment 7	Sol-gel titration.	Possible random check.
April 16	Experiment 8	Schlink line techniques – synthesis of nanoparticles.	
April 23	Experiment 8	Schlink line techniques – synthesis of nanoparticles.	
Monday April 30th		Notebooks due by 5 pm reading Day.	Notebooks Collected

**Evaluation Procedures:** All grades can be accessed via blackboard. The student is responsible for monitoring their own progress and verifying all entered grades. Questionable entries must be handled within one week of posting and the student must provide the instructor with all documentation requested. A midterm grade is reported for work completed before midterm.

$\geq 90\% = \mathbf{A}$      $89\% \leq 80\% = \mathbf{B}$      $79\% \leq 70\% = \mathbf{C}$      $69\% \leq 60\% = \mathbf{D}$      $< 60\% = \mathbf{F}$

**20% Technique:** The student is required to attend, follow safety precautions and actively participate in laboratory activities. Student may take a 15 minute break but otherwise must remain during the entire laboratory period or in the adjacent computer laboratory processing the data. Grades are assigned weekly on 100% scale. Students that do not keep the advanced laboratory clean or who mishandle the instruments can receive a 10% reduction or greater on their final grade.

**30% Announced and 10% Random Notebook Checks:** The required laboratory format will be provided. The primary criteria for a good notebook is the ability of any competent experimentalist to reproduce the experiment without having to consult the person writing the notebook and (2) the ability of an outside party to find all relevant data and data work-up associated with the experiment. The student notebook will be collected twice and will be checked randomly. The notebook is expected to be completed as the experiment is completed and all data worked up by the following week anything may be rewritten in the notebook but all recorded data and written work must be saved.

A note regarding *Collaborative Work*: The cost of materials and the space in the advanced lab makes the use of laboratory partners practical. However, you may work alone if you prefer. With Lab partners, there is limited collaborative work in the laboratory setting. Students will work with only one other person. Partners share the same equipment and collect the same data. Lab partners should have raw lab data collected during lab in common (numbers, measurements, observations). Raw data can be worked up into data tables, graphical analysis or any data interpretation with the lab partner for the purpose of presentation. Lab partners will **not** copy the notebook of another. The recording of data and notebook writings are by the individual. Students who are suspected of copying one another will receive a zero for the notebook grade in question - the assignment of a zero is a warning. Students who copy from one another after one warning will automatically receive a failing grade in the course.

**40% Poster Presentation:** Students must (1) Select an experiment or related group of experiments to present at the VSU Undergraduate research symposium. (2) Submit an abstract by the due date and (3) Prepare and present the poster on March the 28<sup>th</sup>. Students who do not get their abstracts accepted will present a poster to the faculty but will

not receive a grade higher than a 75% on the poster portion of the grade. Students placing first, second or third in the poster presentation at the symposium will automatically receive an A in the course. Students presenting any data collected at any other university must have permission to present those data obtained.

All scores are imputed into Blackboard Using a 100 point percent score. Student can calculate their own grade using the following:

**Midterm Grade** = (participation score average)(0.2) + (Notebook grade)(0.3) + (Random notebook grade)(0.1) + (Abstract and rough draft grade of poster)(0.40)

**Final Grade** = (participation score average)(0.2) + (Notebook grade average)(0.3) + (Random notebook grade)(0.1) + (Final Poster Presentation Grade)(0.40)

**Disabilities:** Reasonable accommodations will be made in accordance with the American Disabilities Act for students with documented disabilities. Students who are covered under the American Disabilities Act should inform the teacher privately of this fact at the beginning of the semester so that appropriate instructional arrangements can be made. The student must provide the appropriate documentation to the instructor from Student Services (see University Policy 12). No extraneous material should be given to the instructor. Ultimately, Student Services is obliged to accommodate students who will need any special arrangements for test/quiz taking.