

Chem 244 – Instrument Design – Spring 2020

Lecture – Nobel Hall 3540, T – 1:30 - 3:20 PM

Laboratory – Nobel Hall 3412

Instructor – Dwight R. Stoll, Ph.D.

Office – Nobel Hall 3534

Campus Phone – Google Voice – 507-933-0699

Email – dstoll@gustavus.edu

Office Hours – By appointment or by chance – check my Google Calendar in the 'About' tab of my website

Course website – <https://dwightstoll.wixsite.com/drstoll>

Required Materials

1. Textbooks – We will use materials from a variety of sources.
2. Bound paper laboratory notebook
3. Approved laboratory eyewear

Course Goal – To provide a learning framework within which students can become competent in some of the concepts that are central to development of chemical instrumentation, and advanced data analysis techniques.

Course Objectives

1. To learn and apply the fundamental concepts of analog/digital input/output needed to interface instrumentation with computers
2. To build simple circuits that enable control of instrument function using computers
3. To explore concepts in advanced data analysis
4. To solve a research-oriented problem using concepts and skills developed in the course
5. To enjoy learning about chemistry and science

Grading – Grading in this course will be based on the following activities, with similar weight assigned to each category.

- Class attendance and Participation
- Assignments
- Weekly Written Project Updates
- Final Project
- Final Presentation

Activity	Number of Events	Points Per Event	Total Points
Weekly Project Updates	6	5	30
Weekly Assignments	1 + 6	1x40 + 6x15	130
Project Deliverables	2	50	100
Written Project Summary	1	50	50
Project Presentation	1	50	50
		Course Point Total	460

Letter grades will be assigned based upon the following scale. ***The instructor reserves the right to lower these cutoffs under special circumstances, however the cutoffs will not be raised under any circumstances.***

% of Points	Letter Grade	% of Points	Letter Grade
92-100	A	75-78	C+
88-92	A-	70-75	C
85-88	B+	67-70	C-
81-85	B	60-67	D
78-81	B-	<60	F

Communication: I strongly prefer communication by email over voicemail. When attaching files, please use the following file-naming convention:

2010-XX-YY 'your initials' 'short description'

For example, in submitting work for offline homework #2 I would use the following filename:
20180903 drs hw_2.doc

Course Content – A large majority of the content that will be covered in lecture can be broken down into four categories.

1. Analog/Digital Input/Output and TTL Logic
2. Circuits and Components for Instrument Control and Data Acquisition
3. LabView Software
4. MatLab Software

Laboratory Activities

Laboratory Project: You will work with the instructor to develop plans for project aimed at solving a research-oriented problem over the course of the semester.

Laboratory Project Presentation: Each lab group will prepare a poster OR oral presentation that captures the entire project for presentation in a campus-wide venue near the end of the semester. More details will be provided in due time.

Laboratory Safety: You will be expected to take reasonable measures in the laboratory to ensure the safety of you and your peers. This includes clear labeling of all containers, responsible and organized collection of waste materials, and wearing protective eyewear at all times in the laboratory, even when you may not be working with chemicals *per se*.

Details

Readings, Preparation, and Assignments – Recommended reading, preparation material, and assignments will be developed in relation to the laboratory project.

Attendance and Participation – You are expected to attend each class period, and contribute your fair share of effort to your laboratory group.

Weekly Written Project Updates – Each lab group should send a brief written update to the instructor summarizing their project work completed in the prior week. The instructor will respond to these updates in writing with feedback on the progress made to date.

Final Project – An assessment rubric will be established once the project objectives are established for each lab group.

Final Presentation – An Assessment rubric will be distributed once each group has decided whether they will do a poster or oral presentation of their project.

Check Your Email - Email is an official means for communication at Gustavus Adolphus College. I expect that you will check your Gustavus email at least once per day.

Understand When You May Drop This Course

It is your responsibility to understand when you need to consider dropping/withdrawing from a course. Refer to the Gustavus Academic Catalog for dates and deadlines for registration.

Incomplete Policy

A grade of incomplete may be awarded at the discretion of the instructor, if requested by the student, under the following conditions: 1) the last day to withdraw has passed, 2) and unforeseen circumstances beyond the student's control (usually restricted to illness or family emergency) preclude completion of the remaining work for the course by the semester deadline. Note that poor planning or having a lot of work to complete at the end of the term are not, in fairness to other students, considered circumstances beyond a student's control. This additional time to complete coursework may not extend beyond the final day of the following semester, and earlier limits may be set at the discretion of the instructor.

The grade "I" for a particular student, along with an expiration date, is reported at the end of the term to the Office of the Registrar on a special form, which is signed by both the instructor and the department chair. A temporary grade will also be submitted, in the computation of which the instructor has considered work not completed as a zero or an F. If before the end of the expiration date, the instructor reports a final grade to the Registrar, that grade will be recorded and the grade point average will be computed accordingly. When the expiration date has passed without a grade being reported, the temporary grade will replace the "I" and become a permanent part of the transcript record.

Requesting Accommodations

Gustavus Adolphus College is committed to ensuring the full participation of all students in its programs. If you have a documented disability, or you think you may have a disability of any nature (e.g., mental health, attentional, learning, chronic health, sensory, or physical) and, as a result, need reasonable academic accommodation to participate in class, take tests or benefit from the College's services, then you should speak with Accessibility

Resources staff for a confidential discussion of your needs and appropriate plans. Course requirements cannot be waived, but reasonable accommodations may be provided based on disability documentation and course outcomes. Accommodations cannot be made retroactively; therefore, to maximize your academic success at Gustavus, please contact Accessibility Resources as early as possible. Accessibility Resources (<https://gustavus.edu/care/accessibility/>) is located in the Center for Academic Resources and Enhancement. Accessibility Resources Coordinator, Kelly Karstad, (kkarstad@gustavus.edu or x7138), can provide further information.

Multilingual Student Support

Some Gustavians may have grown up speaking a language (or languages) other than English at home. If so, we refer to you as “multilingual.” Your multilingual background is an incredible resource for you, and for our campus, but it can come with some challenges. You can find support through the Center for International and Cultural Education’s (<https://gustavus.edu/cice/>) Multilingual and Intercultural Program Coordinator (MIPC), Carly Overfelt (overfelt@gustavus.edu). Carly can meet individually for tutoring in writing, consulting about specific assignments, and helping students connect with the College’s support systems. If you want help with a specific task (for example, reading word problems on an exam quickly enough or revising grammar in essays), let your professor and Carly know as soon as possible. In addition, the Writing Center (<https://gustavus.edu/writingcenter/>) offers tutoring from peers (some of whom are themselves multilingual) who can help you do your best writing.

Mental Wellbeing

The Gustavus community is committed to and cares about all students. Strained relationships, increased anxiety, alcohol or drug problems, feeling down, difficulty concentrating, and/or lack of motivation may affect a student’s academic performance or reduce a student’s ability to participate in daily activities. If you or someone you know expresses such mental health concerns or experiences a stressful event that can create barriers to learning, Gustavus services are available to assist you. You can learn more about the broad range of confidential health services available on campus at <https://gustavus.edu/counseling/> and <https://gustavus.edu/deanofstudents/services/>.

Research Assistance

Students can always get help with research at the library. Reference librarians will help find information on a topic, develop search strategies for papers and projects, search library catalogs and databases, and provide assistance at every step. Drop-ins and appointments are both welcome. Visit https://gustavus.edu/library/reference_question.php for hours, location, and more information.

Gustavus Adolphus College Honor Code

The faculty of Gustavus Adolphus College expects all students to adhere to the highest standards of academic honesty and to refrain from any action that impinges upon academic freedom of other members of the college community. In all academic exercises, examinations, presentations, speeches, papers, and reports, students shall submit their own work. Footnotes or some other acceptable form of citation must accompany any use of another’s words or ideas. Students are especially cautioned that quoting or paraphrasing from electronic sources without proper citation is as serious a violation as copying from a book or other printed source.

In the case of cheating or plagiarism, the instructor will inform the student and the Office of the Provost of the nature of the offense, the penalty within the course, and the recommendation of the instructor as to whether further disciplinary action is warranted. Another instance of academic dishonesty will result in review of the student’s record by the probation committee and may result in the student being placed on academic probation. If a pattern of academic dishonesty continues, the student may be permanently dismissed from the College.

A student may not submit work that is substantially the same in two courses without first gaining permission of both

instructors if the courses are taken concurrently, or permission of the current instructor if the work had been submitted in a previous semester.

The faculty regards the damaging of library materials and failing to sign out or to return them properly, and the misuse of computer files and programs, as equally serious violations of the ethical standards of courtesy, fairness, and honesty that bind together a community of scholars.

Individuals who use the College's computer facilities assume the responsibility of seeing that these resources are used in an appropriate manner. Misuse of computer hardware, software, data, and output is a violation of College policy and regulations and may also be a violation of law if data of other computer users are disturbed or the privacy of individuals is violated.

In order to maintain classrooms as places for the respectful exchange of ideas, and to preserve the integrity of a community of scholars, audio or video recording and dissemination of course-related content require the express permission of the individual faculty member who will also respond to infractions as necessary. Recording as a disability accommodation (without dissemination) is coordinated by the Center for Academic Resources and Enhancement.

Finally, students who serve the College in positions of responsibility in which they deal with test materials, letters of recommendation, and other matters that must be held in confidence are expected to maintain confidentiality and to adhere to the same high standards of personal integrity.

Title IX: Sexual Misconduct Prevention and Resources

Gustavus Adolphus College recognizes the dignity of all individuals and promotes respect for all people. As such, we are committed to providing an environment free of all forms of discrimination including sexual and gender-based discrimination, harassment, and violence like sexual assault, intimate partner violence, and stalking. If you (or someone you know) has experienced or is experiencing these types of behaviors, know that you are not alone. Resources and support are available; you can learn more online at <https://gustavus.edu/titleix/>.

Please know that if you choose to confide in me, I am mandated by the College to report to the Title IX Coordinator, because Gustavus and I want to be sure you are connected with all the support the College can offer. Although it is encouraged, you are not required to respond to outreach from the College if you do not want to. You may speak to someone confidentially by contacting the Sexual Assault Response Team (SART/CADA), Chaplains, Counseling Center, or Health Service staff; conversations with these individuals can be kept strictly confidential. SART/CADA can be reached 24 hours a day at 507-933-6868. You can also make a report yourself, including an anonymous report, through the form at <https://gustavus.edu/titleix/>.

The information listed on the course web site, in the syllabus, and in associated documents is subject to change at the discretion of the instructor.