

# CHEM 3411 – PHYSICAL CHEMISTRY I

## FALL 2018

### Section 1 CRN 80669

9:25-10:40am MW Peeples Hall Rm 111  
3:05-6:00pm W Peeples Hall Rm 318

Hyperlinks for accessibility are provided throughout this document with full URLs noted in the footnote.

## INSTRUCTOR INFORMATION

Dr. Christopher Wozny Peeples Hall, Rm 228  
Phone 706 272-2170  
email [cwozny@daltonstate.edu](mailto:cwozny@daltonstate.edu)

Office hours	Monday	10:45-11:15 am
	Tuesday	10:00-12:30 pm
	Wednesday	8:00-9:00 am, 1:30-3:00 pm
	Thursday	10:00-12:30 pm

and by appointment.

## REQUIRED TEXT AND MATERIALS

*Physical Chemistry*, 3<sup>rd</sup> edition, Thomas Engel and Philip Reid, with *Mastering Physical Chemistry* (ISBN 978-0-321-81200-1)

## CATALOG INFORMATION

An examination of the laws of thermodynamics with applications to the properties of matter including phases, phase transitions, solutions and chemical equilibria. An introduction to concepts of statistical thermodynamics and chemical kinetics. The laboratory experience introduces physical chemistry techniques drawn from these topics.

**Prerequisites:** CHEM 3212K, MATH 2254, PHYS 1112K or PHYS 2212K

## LEARNING OUTCOMES

Upon completion of CHEM 3411, students will be able to:

1. Demonstrate an understanding of thermodynamics principles within a rigorous mathematical and physics-based framework.
2. Apply thermodynamic or chemical kinetic principles to realistic systems to predict outcomes and values of measurable quantities.
3. Draw conclusions about laboratory-based phenomena using mathematical models applied to experimental data.

## LABORATORY SAFETY

The laboratory is an integral part of any science course. When performing chemistry experiments, students **MUST** observe **ALL** safety rules at all times. No one will perform an experiment without goggles when chemicals are involved. There is **NO** eating or drinking in a chemistry laboratory *at any time*. Sandals, open-toed shoes, and shorts are **NOT** permitted in the chemistry laboratory. The instructor will emphasize any special safety precautions in the pre-lab introduction. Failure to follow safety guidelines may result in a lower grade for the experiment, or in cases where infractions have the potential to result in bodily injury to oneself or others, immediate withdrawal of the offender from the course.

## ASSESSMENT AND EVALUATION

The letter grade for the course will be assigned based on a standards-based approach to grading. Sixteen standards have been identified based on course content. Students will demonstrate competency (or mastery) of a Standard by an assessment that is equivalent to a quiz or an exam question.

Each standard has a written description explaining what a student should be able to do to demonstrate an understanding of the scientific principle. The response to each assessment question will include the ability to differentiate between *competence* in the matter being assessed and a *deeper (or thorough) understanding* of the concept or mathematical method. Each assessment will be evaluated at one of three levels: mastery of the standard; competence in the standard; or unsatisfactory understanding of the standard.

Demonstrated competence in all sixteen standards will result in a letter grade of 'C' (average ability). To obtain a letter grade of 'B', a student must demonstrate a mastery of at least four standards with no unsatisfactory evaluations. To obtain a letter grade of 'A', a student must demonstrate a mastery of at least eight of the standards.

Unsatisfactory performance in a standard is mitigated by mastery of another standard (i.e., mastery in one standard and unsatisfactory performance in another standard is equivalent to competence in two standards.) A student with an unsatisfactory performance in a standard will have an opportunity to have a second assessment, but the highest achievement possible will be competence. A student may also request helps or hints while completing an assessment, but the highest possible achievement will be competence.

Not completing standards, or unsatisfactory performance in two or more standards may result in a letter grade of 'D' or 'F'. Students facing that possibility will have individual conversation with the instructor about expected and necessary performance to avoid that outcome.

In addition to standards assessments, there are three Core Requirements: laboratory activities, homework and class preparation assignments, and a comprehensive final exam.

#### *Laboratory activities*

All students are expected to complete ten laboratory experiments and maintain a laboratory notebook. The notebook will be reviewed at the midterm and at course completion. If a report on an experiment is found to be unacceptable upon review at the midterm, the student will be given instructions on how to correct it. After midterm and before the last week of class, the student can request the instructor review any completed lab reports for correction or improvement.

A student is expected to have a minimum of seven acceptable lab reports in the notebook by the end of the course. Three to five unacceptable lab reports will result in the demotion of one of the sixteen standards by one level. Six or more unacceptable lab reports will result in the demotion of two standards. Completing eight (missing two) experiments will result in the highest possible grade of a 'B'; completing seven or fewer experiments will result in the highest possible grade of a 'C'.

In addition, a student and partner must make a presentation concerning an experiment they have completed to the rest of the class at some point during the semester.

#### *Homework assignments*

Students are expected to achieve between 65-90% of the total points assigned for the combination of the Mastering Chemistry and Class Preparation assignments. Achieving less than 65% for these combined assignments will result in a drop of one letter grade; achieving more than 90% for the assignments will result in the promotion of one of the sixteen Standards to the next highest level.

#### *The Final Exam*

The final exam is a cumulative assessment of student understanding of course concepts. A score less than 50% of the final exam points will result in the drop of one letter grade. A score between 65%-51% will result in the demotion of one standard assessment. A score between 80-89% will count as the promotion of one standard assessment. A score of 90% or higher will count as the promotion of two standards.

## EMERGENCY INSTRUCTIONAL PLAN

If the college is closed for inclement weather or other conditions, use the equivalent class time to complete out-of-class activities; specifically, uncompleted on-line home assignments. The instructor will also communicate further instructions through DSC email. If it becomes impossible to send or receive email, or to access on-line resources due to a loss of power, then review the last information we have covered together in class with the expectation on an in-class quiz on that material when classes resume. As always, I will be available to answer questions via email (assuming, of course, there is power). Compensatory make-up days may be required if the total number of days lost exceeds the equivalent of one week of class time.

## ATTENDANCE AND MAKE-UP POLICIES

Attendance is extremely important for the successful completion of this accelerated Summer course. Any student missing two or more of the 16 class days before the midterm of the class should consider withdrawing from the course. ***Attendance may also be included as a factor when assigning the final grade. A written statement posted as an email in GeorgiaVIEW will serve as documentation if that is the case.***

In cases of *demonstrated hardship* (as defined by Dalton State College documents), the student will be given the opportunity to make up the missed work, or an equivalent assignment. The opportunity for a student to make up work for *regular* absences is solely at the discretion of the instructor. No guarantee is given that and missed in-class work may be made up, but if so, it must be completed the first afternoon of the return date (typically the next class day).

## COURSE CALENDAR AND WEEKLY ACTIVITIES

The topics of Physical Chemistry I are Thermodynamics and Chemical Kinetics; we will begin with the kinetic theory of gasses and chemical kinetics. Other than that, the order of the material will closely follow the outline of the textbook (Chapters 33 and 35, then Chapters 1-9, in order). We may also find time for electrochemistry or statistical thermodynamics as special topics.

The Mastering Physical Chemistry courseware includes explicit due dates and policies for homework assignments. The Physical Chemistry Laboratory manual contains information about laboratory policies, instructions for experiments, and a timeline for experiment completion.

The final exam schedule for the term is published on the Dalton State College website at [Dalton State College Current Final Exam Schedule](#).

## COURSE POLICIES AND PROCEDURES

### **CARE TEAM**

(Last Modified May 2018)

The Campus Assessment, Response, and Evaluation Team, also known as CARE, at Dalton State College engages in proactive and collaborative approaches to identify, assess, and mitigate potential risks associated with members of the campus who exhibit concerning or unusual behaviors. Report a concern through the [CARE Reporting Form](#)<sup>i</sup>. Should you have questions, contact the Dean of Students' Office at 706.272.4428.

### **DISABILITY ACCESS**

(From [Disability Access](#)<sup>ii</sup> website)

Students with disabilities or special needs are encouraged to contact Disability Access. In order to make an appointment or to obtain information on the process for qualifying for accommodations, the student should visit the [Disability Access Library Guide](#)<sup>iii</sup> or contact the Disability Access office.

### **Contact information**

Andrea Roberson, Associate Director of Disability Access and Student Support Services  
Pope Student Center, upper level  
706-272-2524  
[aroberson@daltonstate.edu](mailto:aroberson@daltonstate.edu)

### **ETHICAL CONDUCT**

(Last Modified May 2018)

*Academic Dishonesty* Cheating and plagiarism are a part of the Dalton State Student Code of Conduct, which can be found in its most updated form at [Dalton State Student Code of Conduct](#).<sup>iv</sup> ANY assistance provided or given in any way toward work in a class constitutes cheating, unless such behavior is authorized by your instructor. Additionally, any use of the ideas or words of others should be noted, or this will constitute plagiarism. Using another students' work or collaborating on an assignment not designated as collaborative is unacceptable. Furthermore, presenting work that was completed for another class, while not plagiarism technically, is not the same as presenting original work, and is therefore unacceptable unless it has been authorized by your instructor. For more details on what Dalton State considers to be Academic Dishonesty, please review the Student Code of Conduct. Instructors will assign grades based on classroom performance. Additional sanctions may be provided as a learning experience from the Student Conduct process.

*Classroom Behavior* Dalton State is committed to respect via the Roadrunner Respect pledge. To learn more, please visit [Roadrunner Respect](#).<sup>v</sup> “I pledge to show my fellow Roadrunner students, faculty, staff, and administration respect by treating others the way they want to be treated and by thinking about others first before making decisions that might affect them.”

#### **COURSE WITHDRAWAL STATEMENT**

(Last Modified May 2018)

The last day to drop this class without penalty (a W or a required signature) is Friday, October 19. If you complete the proper paperwork to drop the course by this date, you will be assigned a grade of W. After this date, withdrawal without penalty is permitted only in cases of [Extreme Hardship](#)<sup>vi</sup> as determined by the Vice President for Academic Affairs; otherwise a grade of WF will be issued. Students who fail to complete the official drop/withdrawal procedure will receive the grade of F. Withdrawal from class is a student responsibility. The grade of W counts as hours attempted for the purposes of financial aid.

#### **FULL WITHDRAWAL STATEMENT**

(Last Modified May 2018)

The proper form for withdrawing from all classes at the college after the official drop/add period but before the published withdrawal date ([Academic Campus Calendar](#)<sup>vii</sup>) is the [Schedule Adjustment Form](#)<sup>viii</sup>. All students must meet with a staff member at the Dean of Students office in the upper-level of the Pope Student Center to initiate the withdrawal process and complete an exit interview. After meeting with the staff member, students will then finalize the withdrawal process in the Enrollment Services Office.

#### **GRADE APPEALS**

(Last Modified May 2018)

A student may file a formal challenge to a grade if there is unequivocal evidence that one or more of the following applies:

- a) It was a direct result of arbitrary and capricious conduct on the part of the instructor;
- b) The instructor discriminated against the student on the basis of a protected classification as the term is defined by Federal Law, Georgia State Law, or the Administrative Code of the City of Dalton;
- c) The grade was incorrectly calculated;
- d) A clerical error occurred in recording the grade; or
- e) A mitigating circumstance prevented the student from completing a final assignment or attending the final exam.

To appeal a grade, the student must notify the instructor in writing no later than two days after the posting of final grades. See [Grade Changes and Appeals](#)<sup>ix</sup> for the complete documentation.

#### **ACADEMIC PROGRESSION**

(Last Modified May 2018)

To remain in academically good standing, students must maintain an institutional GPA of 2.0 or higher. Students who do not maintain a 2.0 move through a sequence of statuses ranging from Academic Warning to Academic Probation to Academic Suspension to Academic Dismissal. See [Academic Progress](#)<sup>x</sup> for the complete documentation.

#### **TITLE IX INFORMATION**

[Student Sexual Misconduct Policy](#)<sup>xi</sup>

(Last Modified May 2018)

In accordance with Title IX of the Education Amendments of 1972 (“Title IX”), the University System of Georgia (USG) does not discriminate on the basis of sex in any of its education programs or activities or in employment. The USG is committed to ensuring a safe learning and working environment for all members of the USG community. To that end, this Policy prohibits sexual misconduct, as defined herein.

Please visit the [Title IX at Dalton State web page](#)<sup>xii</sup> for additional information on the [policy](#)<sup>xiii</sup>, [How to Report](#)<sup>xiv</sup>, [Resources](#)<sup>xv</sup>, and [Campus Programs](#)<sup>xvi</sup>.

#### **HOUSE BILL 280**

(Last Modified May 2018)

[House Bill 280](#)<sup>xvii</sup> commonly known as the “campus carry” legislation, is effective as of July 1, 2017.

#### **OFFICIALLY APPROVED DSC GROUPS AND ACTIVITIES**

(Last Modified May 2018)

When students are engaged in officially approved Dalton State groups or activities that require them to participate in events off campus during school days, they shall be treated similarly to any faculty or staff member acting in that same capacity. Thus, just as faculty and staff have excused absences from their regular work schedules, students shall be excused from class without penalty if they are off campus representing Dalton State College in an approved, official capacity during their regular class time. Examples include presenting a paper or otherwise participating in a conference, attending a University System student affairs event, participating in intercollegiate competition (athletic or academic), participating in an approved field trip, etc.

Just as faculty and staff members are required to submit Request to Travel forms for approval, in order to be excused, the student needs to provide the following information to the instructor prior to the date when he/she will be absent from class:

- notification of the event (in the case of athletics, students should provide each instructor a schedule of away events at the beginning of the semester or as soon as possible after the schedule is available);
- estimated time of departure from and return to campus (for example, if a student has an away game in the evening and will not be leaving campus until 3:00, he/she will not be excused from classes prior to that time on that day; similarly, if the event is in the morning and the student will be returning to campus during the day, he/she is expected to attend any class scheduled after the return trip); and
- contact information for the person or organization sponsoring/authorizing the student's participation in the event

The student shall be allowed to make up any work missed during the time he/she is off campus representing DSC in an official capacity. He/she shall discuss what will be missed with the instructor and make arrangements to make up any assignments, tests, presentations, etc. scheduled on that date.

## FULL URL LINKS

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- i [CARE Reporting Form](https://cm.maxient.com/reportingform.php?DaltonStateCollege&layout_id=1): [https://cm.maxient.com/reportingform.php?DaltonStateCollege&layout\\_id=1](https://cm.maxient.com/reportingform.php?DaltonStateCollege&layout_id=1)
- ii [Disability Access](http://libguides.daltonstate.edu/c.php?g=24716&p=149667): <http://libguides.daltonstate.edu/c.php?g=24716&p=149667>
- iii [Disability Access Library Guide](http://libguides.daltonstate.edu/c.php?g=24716&p=149663): <http://libguides.daltonstate.edu/c.php?g=24716&p=149663>
- iv [Dalton State Student Code of Conduct](https://www.daltonstate.edu/campus_life/code-of-conduct.cms): [https://www.daltonstate.edu/campus\\_life/code-of-conduct.cms](https://www.daltonstate.edu/campus_life/code-of-conduct.cms)
- v [Roadrunner Respect](https://www.daltonstate.edu/campus_life/respect-photo-gallery.cms): [https://www.daltonstate.edu/campus\\_life/respect-photo-gallery.cms](https://www.daltonstate.edu/campus_life/respect-photo-gallery.cms)
- vi [Extreme Hardship](https://www.daltonstate.edu/skins/userfiles/files/DSC%20website%20landing%20page%20information.pdf):  
<https://www.daltonstate.edu/skins/userfiles/files/DSC%20website%20landing%20page%20information.pdf>
- vii [Academic Campus Calendar](https://www.daltonstate.edu/about/calendars.cms): <https://www.daltonstate.edu/about/calendars.cms>
- viii [Scheduled Adjustment Form](https://www.daltonstate.edu/skins/userfiles/files/schedule-adjustment-form.pdf): <https://www.daltonstate.edu/skins/userfiles/files/schedule-adjustment-form.pdf>
- ix [Grade Appeals](https://libguides.daltonstate.edu/ld.php?content_id=42740257): [https://libguides.daltonstate.edu/ld.php?content\\_id=42740257](https://libguides.daltonstate.edu/ld.php?content_id=42740257)
- x [Academic Progression](https://libguides.daltonstate.edu/ld.php?content_id=42740270): [https://libguides.daltonstate.edu/ld.php?content\\_id=42740270](https://libguides.daltonstate.edu/ld.php?content_id=42740270)
- xi [Student Sexual Misconduct Policy](http://www.usg.edu/policymanual/section4/policy/C327/): <http://www.usg.edu/policymanual/section4/policy/C327/>
- xii [Title IX at Dalton State web page](https://www.daltonstate.edu/about/title-ix.cms): <https://www.daltonstate.edu/about/title-ix.cms>
- xiii [Title IX Policy](https://www.daltonstate.edu/about/title-iv-policy.cms): <https://www.daltonstate.edu/about/title-iv-policy.cms>
- xiv [Title IX How to Report](https://www.daltonstate.edu/about/title-ix-report.cms): <https://www.daltonstate.edu/about/title-ix-report.cms>
- xv [Title IX Resources](https://www.daltonstate.edu/about/title-ix-campus-community-resources.cms): <https://www.daltonstate.edu/about/title-ix-campus-community-resources.cms>
- xvi [Title IX Campus Programs](https://www.daltonstate.edu/about/title-ix-campus-community-resources.cms): <https://www.daltonstate.edu/about/title-ix-campus-community-resources.cms>
- xvii [House Bill 280](http://www.usg.edu/hb280): <http://www.usg.edu/hb280>