

Date Submitted: 12/02/19 2:24 pm

Viewing: **CHEM 531 : Elements of Physical Chemistry** ~~Phys-Chem~~

Last edit: 12/02/19 2:24 pm

Changes proposed by: jbazaz

In Workflow

1. Registrar-Courses:Title Change
2. CHEM Chair
3. SC Curriculum Committee
4. SC Associate Dean
5. Assoc Provost-Graduate
6. Registrar-Courses
7. Banner

Select modification type:

Substantial

Are you completing this form on someone else's behalf?

Yes

Requestor:

Name	Extension	Email
Pritha Roy	5105	proy4

Effective Term: Fall 2020

Subject Code: CHEM - Chemistry Course Number: 531

Bundled Courses:

Is this course replacing another course? No

Equivalent Courses:

Catalog Title: Elements of **Physical Chemistry** ~~Phys-Chem~~

Banner Title: Elements of **Physical Chemistry**
~~Phys-Chem~~

Will section titles vary by semester? No

Credits: 3

Schedule Type: Lecture

Hours of Lecture or Seminar per week: 3

Repeatable: May only be taken once for credit (NR)
GRADUATE ONLY

Default Grade Mode: Graduate Regular

Recommended Prerequisite(s): CHEM 211, 212; CHEM 313, 314; PHYS 243, 245 (college physics), MATH 113, or Permission of Instructor.

Recommended Corequisite(s):

Required Prerequisite(s) / Corequisite(s) (Updates only):

Registrar's Office Use Only - Required Prerequisite(s)/Corequisite(s):

And/Or	(Course/Test Code	Min Grade/Score	Academic Level)	Concurrency?

Registration Restrictions (Updates only):

Registrar's Office Use Only - Registration Restrictions:

Field(s) of Study:

Class(es):

Include

Limited to students with a class of Senior Plus. (SCRRCLS_ONLY_SP)

Limited to students with a class of Non Degree (SCRRCLS_ONLY_ND)

Limited to students with a class of Advanced to Candidacy. (SCRRCLS_ONLY_DC)

Limited to students with a class of Graduate. (SCRRCLS_ONLY_GR)

Level(s):

Include

Enrollment limited to students with a level of Non-Degree (SCRRLVL_ONLY_ND)

Limited to undergraduate level students. (SCRRLVL_ONLY_UG)

Limited to graduate level students only. (SCRRLVL_ONLY_GR)

Degree(s):

Exclude

Non-Degree Undergraduate Degree students may not enroll. (SCRRDEG_NO_NDU)

School(s):

**Catalog
Description:**

The course offers an intensive overview of the concepts, techniques, and models of physical chemistry as they apply to many branches of chemistry and allied sciences. The emphasis is for the students to develop practical skill in applying the concepts of thermodynamics, kinetics, and quantum mechanics to chemical systems at both the macroscopic and the atomic/molecular level. This course will use spreadsheet models to investigate chemical and physical systems.

Justification:

Physical Chemistry is a pre-requisite for any graduate work in Chemistry. This course is for those non-chemistry (science) majors who have not taken a comprehensive Physical Chemistry course during their undergraduate studies. They can take this course and transfer to a chemistry track for grad school.

**Does this course cover material which
crosses into another department?**

No

Learning Outcomes:

Attach Syllabus

[CHEM 531_syllabus.pdf](#)

**Additional
Attachments**

**Specialized Course
Categories:**

**Additional
Comments:**

Reactivating CHEM 531 for Fall 2020. Was deactivated Fall 2015 so it meets the five year requirement for a reactivation.

**Reviewer
Comments**

CHEM 531-xxx

Syllabus

Semester YYYY

Hours:

Location:

Instructor Info

Dr. Pritha G. Roy
proy4@gmu.edu

361 Planetary Hall
(703) 993-5105

Student (Office) Hours will be held on----- . Appointments are also encouraged if office hours do not fit your schedule.

Chem 531: Elements of Physical Chemistry

Prerequisites: CHEM 211 and 212 (General Chemistry I and II), CHEM 313 and 314 (Organic Chemistry I and II), PHYS 243 and 245 (College Physics I and II), MATH 113 (Analytic Geometry and Calculus I), or permission of instructor.

Textbook: *The Elements of Physical Chemistry, 7e*, P.W. Atkins and J. de Paula, Oxford University Press. 2017.

Other readings and supplements as assigned

Course objectives:

The course offers an intensive overview of the concepts, techniques, and models of physical chemistry as they apply to many branches of chemistry and allied sciences. The emphasis is for the students to develop practical skill in applying the concepts of thermodynamics, kinetics, and quantum mechanics to chemical systems at both the macroscopic and the atomic/molecular level. This course will use spreadsheet models to investigate chemical and physical systems. Specific focus will be on the following:

- Focus 1:** The Properties of Gases
- Focus 2:** The First Law of Thermodynamics
- Focus 3:** The Second Law of Thermodynamics
- Focus 4:** Physical Transformations
- Focus 5:** Chemical Change
- Focus 6:** Chemical Kinetics
- Focus 7:** Quantum Theory
- Focus 8:** Atomic Structure
- Focus 9:** The Chemical Bond
- Focus 10:** Molecular Interactions
- Focus 11:** Molecular Spectroscopy
- Focus 12:** Statistical Thermodynamics

Assignments, examinations, and grading:

Homework will be assigned on the concepts learned. The following is the grade distribution.

Homework problem sets (30%)

Two midterm examinations (40%)

Final examination (30%)

Use of technology:

The homework problem sets will make extensive use of spreadsheet models and graphing. Familiarity with a spreadsheet program such as Microsoft Excel™ is required.

The use of personal electronic devices is required at times in this class. You will only be permitted to work on material related to the class.

- Cell phones, pagers, and other communicative devices are not allowed, especially during exams. Please keep them stowed away, turned off, and out of sight. Laptops or tablets (e.g., iPads) may be permitted for the purpose of taking notes only or in-class problem solving as mentioned above. Engaging in activities not related to the course (e.g., gaming, email, chat, etc.) will result in a significant deduction in your grade.
- Please be respectful of your peers and your instructor and do not engage in activities that are unrelated to class. Such disruptions show a lack of professionalism.

Academic Integrity:

Mason is an Honor Code university; please refer to <https://oai.gmu.edu/mason-honor-code/full-honor-code-document/> to familiarize yourself with the GMU honor code.

Academic discussion and debate are encouraged in this course, with the firm expectation that all aspects of the class will be conducted with civility and respect for differing ideas, perspectives, and traditions. When in doubt (of any kind) please ask for guidance and clarification.

Disability Services at GMU

Disability Services at George Mason University is committed to providing equitable access to learning opportunities for all students by upholding the laws that ensure equal treatment of people with disabilities. If you are seeking accommodations for this class, please first visit <https://ds.gmu.edu/> for detailed information about the Disability Services registration process. Then please discuss your approved accommodations with me. Disability Services is located in Student Union Building I (SUB I), Suite 2500. Email:ods@gmu.edu | Phone: (703) 993-2474.

Diversity and Inclusion

The Department of Chemistry and Biochemistry, an intentionally inclusive community, promotes and maintains an equitable and just work and learning environment. We welcome and value individuals and their differences including race, economic status,

gender expression and identity, sex, sexual orientation, ethnicity, national origin, first language, religion, age, and disability.

Sexual Harassment, Sexual Misconduct, and Interpersonal Violence

As a faculty member and designated “Responsible Employee,” I am required to report all disclosures of sexual assault, interpersonal violence, and stalking to Mason’s [Title IX Coordinator](#) per [university policy 1412](#). If you wish to speak with someone confidentially, please contact the [Student Support and Advocacy Center](#) (703-380-1434) or [Counseling and Psychological Services](#) (703-993-2380). You may also seek assistance from [Mason’s Title IX Coordinator](#) (703-993-8730; titleix@gmu.edu).

Privacy:

Students must use their MasonLive email account to receive important University information, including communications related to this class. There will be no responses to messages sent from a non-Mason email address.

Tentative Class Schedule (Based on Fall 2019 calendar - will

August

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
25	26	27 Syllabus, Intro Focus 1	28	29 Focus 1	30	31

September

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3 Focus 2	4	5 Focus 2	6	7
8	9	10 Focus 3	11	12 Focus 3	13	14
15	16	17 Focus 3 / 4	18	19 Focus 4	20	21
22	23	24 Focus 4	25	26 Focus 4	27	28

October

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
29	30	1 Focus 5	2	3 Exam 1 (Focus 1-4)	4	5
6	7	8 Focus 5	9	10 Focus 6	11	12
13	14	15 No class fall break	16	17 Focus 6/7	18	19
20	21	22 Focus 7	23	24 Focus 8	25	26
27	28	29 Focus 8	30	31 Focus 9	1	2

November

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4	5 Focus 9	6	7 Focus 10	8	9
10	11	12 Focus 10 Chem bonding	13	14 Focus 11 Chem Bonding	15	16
17	18	19 Focus 11 Shapes of molecules	20	21 Exam 2 Focus (4- 10)	22	23
24	25	26 Focus 12	27	28 HOLIDAY (no class)	29	30

December

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3 Focus 12	4	5 Review	6	7
8	9	10	11	12 <i>Final ACS exam - Compreh ensive</i>	13	14
15	16	17	18	19	20	21