

## Fall 2024 Syllabus, Revision 1

Rutgers, The State University of New Jersey-Camden Campus  
Department of Chemistry

Green Chemistry / Special Topic: Green Chemistry  
50:160:420 or 56:160:575

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### General Information:

**Instructor: David Salas-de la Cruz, Ph.D., EIT**

Office: Science Building, Room: 200A

Primary Phone: (856) 225-6147

Secondary Phone: (856) 225-6142

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### Optional Textbooks:

Green Chemistry: Theory and Practice by Paul T. Anastas and John C. Warner, 2020  
Paperback.

Green Chemistry: Principles and Case Studies by Felicia A. Etzkorn, 2020.

Green Chemistry and the Ten Commandments of Sustainability by Stanley E.  
Manahan, 2024.

Chemistry: The Molecular Nature of Matter 7<sup>th</sup> Edition, Neil D. Jespersen and Alison  
Hyslop, Wiley, 2015.

Chemical Principles: The Quest for Insight Sixth Edition, Peter Atkins, Loretta  
Jones, and Leroy Laverman, W.H. Freeman and Company, 2013.

### Location, Date, and Time:

Science Building Lecture Hall

Every Tuesday's

6:00 PM-8:50 PM

***Pre-requisite: 50:160:336 Organic Chemistry I, 50:160:340: Organic Chemistry  
Laboratory II; 50:640:122 Calculus II.***

A Rutgers Computer Account is required to access the Canvas course at <https://canvas.rutgers.edu/> (students that have a Rutgers email and have registered for the course should already have access).

### Course Objectives:

This course aims to build a strong, practical understanding of the principles of green chemistry and explore how chemistry can be used to address global manufacturing challenges and improve human condition and health. We will assess chemical industrial processes and their risks. A key focus of this course will be the discovery and development of fundamental chemical transformations that are environmentally

friendly and sustainable. Students will apply these concepts to design products to eliminate hazards from chemical processes. In essence, students will learn to use and produce non-toxic chemicals, minimize the use of chemical and energy resources, and prevent accidents.

**Course Objectives:**

- Develop a solid foundation in chemistry fundamentals, including periodic table trends, electronegativity, stoichiometry, molecular structure, reactivity, and nomenclature, as well as an understanding of toxicity and the molecular basis of hazards.
- Understand the historical and current role of chemicals in society and the economy, including the impact of chemical accidents, and learn how Green Chemistry can help design safer products and industrial systems.
- Evaluate the qualitative and quantitative impacts of chemical products and processes on human health and the environment and recognize the tools available for designing and synthesizing new chemical products and processes, with an emphasis on energy efficiency.
- Explore the transformational role of Green Chemistry in the global economy, focusing on its potential to enhance material and energy efficiency and reduce environmental and health risks.

**Study time:**

You should expect to spend **AT LEAST 1.5** hours studying and problem-solving (for **EVERY** hour of class).

**Undergraduate Grading Assessment:**

Exam 1 (Midterm)	35%
Final Exam	35%
Presentation	20%
Homework's	5%
Attendance	5%

**Graduate Grading Assessment:**

Exam 1 (Midterm)	25%
Final Exam	25%
Presentation	20%
Report	15%
Homework's	5%
Scientific Journal One Page Reviews	5%
Attendance	5%

**Exams:**

There will be a midterm exam lasting one and a half hours, which will be a closed-book format, as well as a final exam covering the topics discussed in the semester lectures. Review your book, notes, and homework. **Exams will not be “curved.” Everyone can earn an “A” grade. The grading scheme is as follows: A, B+, B, C+, C, D, and F**

**Presentation:**

You must consult the assigned presentation schedule in the Lectures and Canvas for all due dates. The instructor will not be responsible for reminding you that the presentation is due or that an exam will be given.

Each group of students is required to present a green chemistry solution. This solution could focus on eliminating carbon dioxide, improving cosmetic products, developing new eco-friendly materials, or finding innovative ways to reduce energy consumption. Consider all the products in your home and come up with a new environmentally friendly method to manufacture them.

**Written Report for Only Graduate Students**

Section of the written report:

- Title
- Introduction
- Intellectual Merits of the Green Chemistry Idea
- Broader Impact of Green Chemistry Idea
- Conclusion

The student should expect to write a minimum of 10 pages at 1.5 spacing and with a letter size of 12. The students should use EndNote for reference using the ACS format style.

**Attendance:**

Attendance is worth 5% of your grade. Students are responsible for signing in for each class session. “Students are expected to attend all scheduled sessions and recitations of the courses for which they are registered. Absences normally impair both student proficiency and the accuracy of their instructor’s evaluations. Students with excessive absences may, at the discretion of the instructor, be given a failing grade in the course.” - Camden Undergraduate Catalog

**Make-up Policy:**

Exams: Only one of the exams may be made up **for serious reasons only**. Evidence of such reasons must be provided. Whether the reason for an absence is considered serious is up to the discretion of the professor. The test should be scheduled within the first 24-48 hours after the original test date.

**Methods of Teaching:**

Lectures will be provided using PowerPoint where hopefully we will concentrate on understanding scientific and design concepts. This course will concentrate on active and inquiry-based learning. It is your responsibility and obligation to complete the required readings before the section and exams. Please bring your laptop at all times to reduce paper consumption. Rule of thumb: Make sure you clearly understand each chapter’s problems and class problems. Class time may be used for clarifying written

materials, introducing new material, and identifying and applying principles and concepts, including in-class demonstrations.

### **Canvas**

All information regarding lectures and tests will be posted on Canvas. Before each lecture, please download the appropriate lesson presentation. After the lecture, any class notes or changes will be posted again on Canvas. The student is responsible for reviewing the entire problem set. If the students have any questions, please make the necessary appointment to discuss them with me.

### **Other Policies and Student Expectations:**

#### **Cell Phone Policy:**

Cell phones or any other communication devices should be turned off or in silent mode at all times during class. If you are expecting an important call, are on call for your job or the military, or are the primary caregiver for a child in childcare, please inform the instructor at the beginning of class and you may answer the call outside the classroom.

Using a cell phone or other device during class to send or receive texts or emails, surf the web, or play games is disrespectful and distracting to your classmates, and therefore is not allowed (otherwise indicated by the professor). You may use computers only for work related to this course.

#### **Penalties for cell phones/computer usage:**

If the professor continually sees a student texting on their mobile or using their laptop for Facebook or other sites non-related to the class lecture student will receive a zero in attendance on the day of the act and will be subjected to a deduction of points on their grade from the final exam.

**NOTE: If these penalties are not sufficient and students keep texting, the professor can decide to give pop quizzes to the entire class.**

#### **Audio/Visual Recording:**

Neither audio (such as headphones) nor video recording will be permitted except under special circumstances. You are also not allowed to use the camera in your phone to record pictures or video, without express consent of the instructor.

## **Academic Integrity and Student Code of Conduct**

Rutgers University–Camden seeks a community that is free from violence, threats, and intimidation; is respectful of the rights, opportunities, and welfare of students, faculty, staff, and guests of the University; and does not threaten the physical or mental health or safety of members of the University community, including in classroom space, and a community in which students respect academic integrity and the integrity of your own and others' work.

As a student at the University, you are expected to adhere to the [Student Code of Conduct](#) and [Academic Integrity Policy](#).

Academic Integrity is critical to the success of our students and the community and is everyone's responsibility to take their education seriously and follow the requirements to ensure that you are doing your own work and following the guidelines of the course and professor and program.

Please Note: The conduct code specifically addresses disruptive classroom conduct, which means “engaging in behavior that substantially or repeatedly interrupts either the instructor’s ability to teach or student learning. The classroom extends to any setting where a student is engaged in work toward academic credit or satisfaction of program-based requirements or related activities.” Please be aware of in-classroom and out-of-classroom expectations by making yourself familiar with and by following the Student Code of Conduct.

## Center for Learning and Student Success

The Center for Learning and Student Success (CLASS) provides academic support and enrichment services for students, at no additional cost, including one-on-one tutoring, small group tutoring and workshops, online tutoring, writing assistance, student success coaching, learning assessment, and metacognition training. Through collaboration with academic departments and faculty, CLASS facilitates programs and provides academic resources to students. Our Learning Specialists provide learning-specific resources and support to students on academic or continued probation. CLASS is in Armitage Hall, second floor, suite 231. To learn more or to schedule an appointment, visit the [CLASS website](#), [email us](#) or call us at [\(856\) 225-6442](#).

### **Mid-Term Progress Reporting**

Each semester, typically from Week 6 through Week 8, faculty are offered the opportunity to provide students with feedback regarding their academic performance. Mid-term progress Reports are intended to encourage students to reflect on their academic performance and to take action, if necessary, to improve their academic outcomes. Students are notified immediately and provided information regarding available resources via email if they receive a progress report indicating concern. Students can access the details of their current and past progress reports by signing into [Raptor Connect](#). Mid-term progress Reporting encourages communication among faculty, students, advisors, and student success staff, which is critical to our academic mission.

## Chosen Name (Preferred Name), pronunciation, and pronouns

If you have a chosen name or preferred name or pronouns other than what is listed on the roster, let us know. If you would like to have your name changed officially on Rutgers University–Camden rosters, please follow our [Chosen Name Process](#).

In addition, within your Canvas course sites, the [Rutgers Shout-Out](#) tool allows you to type the phonetic spelling of your name and record the pronunciation of your name in a shared audio recording for your professor and fellow students.

## Dean of Students Office—CARES Team

College is a time when you may be testing your independence and/or striving to find yourself. It's not uncommon for these journeys to have rough points. The Dean of

Students Office is here to assist you by strategically and effectively handling and referring student concerns/needs across all areas of the campus and University as needed. For some students, personal, emotional, psychological, academic, or other challenges may hinder their ability to succeed both in and outside of the classroom. The Dean of Students Office serves as your initial contact if you need assistance with these challenges. You can learn more about the free services by calling [\(856\) 225-6050](tel:856-225-6050), [emailing](#), or visiting the [Dean of Students website](#).

## Office of Disability Services (ODS)—Students with Disabilities

If you need academic support for your courses, accommodations can be provided once you share a Letter of Accommodation issued by the Office of Disability Services (ODS) that specifies your accommodations indicated. If you have already registered with ODS and have your Letter of Accommodation, please share this with your instructor early in the course. If you have not registered with ODS and you have or think you have a disability (learning, sensory, physical, chronic health, mental health or attentional), please visit the [ODS website](#), [email](#), or call [\(856\) 225-6954](tel:856-225-6954).

Please Note: Accommodations will be provided only for students with a Letter of Accommodation from ODS. Accommodation Letters only provide information about the accommodation, not about the disability or diagnosis.

## Help Desk (IT support and services)

For technical assistance, visit Help Desk in the Rutgers Student Computer Lab on the first floor of Robeson Library, call [\(856\) 225-6274](tel:856-225-6274) or [email](#). Help Desk support is available during [lab hours](#). Visit the [IT FAQ page](#) for information and documentation.

## Paul Robeson Library (reference desk, study space, computer lab, resources)

We are here to help you succeed! Our dedicated library team will boost your library research skills via workshops and reference help. Our experts will help you find the latest resources to advance your research and strengthen your teaching. If we don't have what you are looking for, our team will get those items from partner libraries. Our vibrant exhibits and displays will tell you many new stories and our Rutgers–Camden faculty publications area will inspire you. Robeson Library is part of what makes Rutgers–Camden an exciting place to learn! More information is available on the [Robeson Library website](#).

## Office of Military and Veteran Affairs—Veteran, Active Duty, & National Guard Member Services

The Office of Military and Veterans Affairs and Rutgers University–Camden support our students who have served and their family members, including providing explanations of benefits, referrals to resources on and off campus, supporting students who are deployed for active duty, and answering questions. If you need assistance and are an active duty, National Guard, or veteran (or are a family member), we can assist. Find more information by calling 856-225-2791 or visiting the [Office of Military and Veteran Affairs website](#)

## Title IX and the Violence Prevention & Victim Assistance Office

Rutgers University–Camden strives to create a campus community free from discrimination and interpersonal violence and harm. If you have experienced sexual violence, domestic/dating violence, stalking or any form of sex or gender discrimination, help is available. The office for Violence Prevention and Victim Assistance provides support to students. For more information about VPVA or to schedule a time to speak with an advocate visit the [VPVA website](#). To report an incident or speak with the Title IX coordinator, please visit our [Title IX website](#). If you choose to disclose to me, thank you for trusting me. I am obligated to report any disclosures to our title IX coordinator to ensure you receive the appropriate support and university response.”

Please Note: All Rutgers employees (other than those designated as confidential resources such as advocates, counselors, clergy, and healthcare providers as listed in Appendix A to Policy 60.1.33) are required to report information about such discrimination and harassment to the University. This means that if you tell me or any faculty member about a situation of sexual harassment or sexual violence, or other related misconduct, we must share that information with the University’s Title IX Coordinator.

## Wellness Center—Health and Wellbeing Resources

Health and well-being impact learning and academic success. Throughout your time in college, you may experience a range of concerns that can create barriers to your academic success. These might include illnesses, strained relationships, anxiety, high levels of stress, alcohol or drug problems, feeling down, or loss of motivation. The Wellness Center Medical and Counseling staff can help with these or other issues you may experience. You can learn about the free, confidential medical and mental health services available on campus by calling [\(856\) 225-6005](tel:856-225-6005), visiting the [Wellness Center website](#), or visiting the Wellness Center on the 2nd Floor of the Campus Center.

## Wellbeing—National and State Resources in Alphabetical Order

- Crisis Text Line: text HOME to 741741
- Crisis Text Line for Students of Color: text STEVE to 741741
- National Domestic Violence Helpline: [\(800\) 799-7233](tel:800-799-7233) or text LOVEIS to 22522
- National Substance Abuse helpline, SAMHSA’s National Helpline, [\(800\) 662-HELP](tel:800-662-HELP) (4357)
- National Suicide Prevention Lifeline: [\(800\) 273-8255](tel:800-273-8255)
- [NJ HOPE line](#) website
- The Sexual Assault helpline at [\(800\) 656-HOPE](tel:800-656-HOPE) (4673)
- Trevor Lifeline (LGBTQ+): [\(866\) 488-7386](tel:866-488-7386)

## Writing and Design Lab—Writing Support and Services

If you need assistance with writing, audio recordings, web creation, or other technology used in class for creating content, the Writing and Design Lab can help.

They offer personal tutoring, workshops, and online assistance. You can learn more by emailing [rutgers.wdl@rutgers.edu](mailto:rutgers.wdl@rutgers.edu) or visiting the [WDL website](#). From the website, you can schedule an appointment.



## GREEN CHEMISTRY SCHEDULE

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*Please note that the schedule is prompt to slight changes as it depends on material selection length, level of understanding, and student participation.*

Week 1

Introduction

Accidents and Their Unintentional Consequences

What is Green Chemistry?

Week 2:

Planet Earth and Chemical Cycles

Principles of Green Chemistry: Reimagining Chemistry

Green Chemistry: Atoms, Compounds and Molecules

Week 3:

Green Chemistry: Stoichiometry and Reactions

Limiting Reagent, yield, and the Atom Economy

**Week 4: NO CLASS September 24**

Week 5:

Sustainability

Renewable Feedstock

Week 6

Real-World Cases for Green Chemistry

**Week 7**

**Exam 1**

Designing for Recycling and Degradation

Week 8

Cont. Designing for Recycling and Degradation

Catalyst

Week 9

Solvents and working without the,

Week 10

Green analytical chemistry

Introduction to Toxicology

**Week 11**

**Plant Visit**

Week 12

Molecular Toxicology, Chemical Exposure, and Dosage

Week 13  
Designing Future Products

Week 14  
**Students Presentations**

Week 15:  
**Cont. Student Presentations.**

**FINAL EXAM: TBD**

## Revisions History

Revision	Note
1	Original