The College of New Jersey

Chemistry Department

Preregistration Newsletter
for Fall 2023 Registration

Hello Chemistry Majors!

The registration window for Fall 2023 begins April 4th. Here is some information that might be useful for planning your schedule:

- **Preparing for your Advising Meeting**
- **Important Notes and Changes**
- **Specializations in the Chemistry Department**
- **Advanced Options Courses**
- **Looking Ahead to Options Courses for Spring 2024?**
- **Chemistry Department Registration Planning Form**

Upcoming Dates to Remember

Mid-semester progress reports	March 6-20, 2023
Spring Break	March 13-17, 2023
Advising Window	March 20-April 3, 2023
Last Day to Withdraw	March 27, 2023
Enrollment Period	April 4-14, 2023
Celebration of Student Achievement (COSA)	April 25, 2023 (no classes)
Last Day of Classes	May 5, 2023
Spring Commencement (Chemistry)	May 18, 2023

Preparing for Your Advising Meeting

You must meet with your advisor BEFORE you can register. Hold flags have been placed on your accounts that will be removed after your meeting.

Please remember to:

- Make an advising appointment via Google calendar with your advisor. Your advisor will send you an invitation. **Your advisor will indicate whether this session will occur in person or remotely.** Your advisor will be in contact with information about their advising appointments and means of virtual communication for the advising appointments.

- Review the chemistry major requirements in the Undergraduate Course Bulletin.

- Check out course offerings and requirements on PAWS. Use the Academic Requirements feature in PAWS to see the courses you need and to plan your course schedule. Fill your shopping cart with the courses you need, including alternate selections in the event of closed sections. **Create at least one backup plan**.

- Use the Validate feature on PAWS to make sure you have the correct pre-requisite courses.

- If you took any courses for Credit/No Credit in the Spring of 2020 or 2021 that is a prerequisite for another course, registration could be impacted if the cart is not validated! Those students who might encounter this issue have already been messaged by Records and Registration. If you have a validation error due to the credit/no credit option, contact the chair of the department of the class you want to take.

- Review the goals of academic advising before your meeting.
  1st Year and Transfer Students! If you didn't do this previously, make sure to download, read, sign, and bring this Advising Agreement (linked above) to your academic advisor.

- Send copies of your *Chemistry Department Registration Planning* form (see page 9), your proposed course schedule(s) for Fall 2023, and an unofficial transcript to your advisor prior to your meeting.

If you are unable to enroll in a Chemistry course because it has already reached capacity, please visit the course waitlist at chemistry.tcnj.edu/waitlists.
If you are unable to enroll in a course in another department, consult their departmental website (the Chemistry Department cannot enroll you in these courses).

The College WAITLISTING PROCESS

Important Notes and Changes

- ☐ **IMPORTANT! Pre-registration for rising sophomores, juniors, and seniors:** In an effort to reduce some of the stress around registering for advanced chemistry courses, and to ensure equitable placement into these courses, we have implemented a pre-registration process. Please fill out this form by March 24, 2023 at 5 PM.

- ☐ **Declaring a Specialization:** Before you can complete the application (change of major form) to add a specialization, you will be required to complete a number of foundational courses. Because of this, the earliest you will be able to apply is the spring of your first year. Students typically apply to add a specialization in their sophomore year.

- ☐ **Required Prerequisite Grades:** The minimum required grade for course progression and retention in the major is now a C- for CHE 201/202, 310, and 331. Additionally, you must earn at least a 2.0 GPA in these courses by the end of the sophomore year.

- ☐ **Reserved Seats:** We have seats reserved in CHE201, CHE202, CHE331, CHE332, and CHE310 for Chemistry majors; see PAWS for sections.

- ☐ **Notes for Pre-Health Students:** Remember that you can seek out advising from the Medical Careers Advising Committee in addition to your advisor in Chemistry. You may also want to consider working towards a Spanish Certificate for Healthcare Professionals.

- ☐ **Course Delivery Mode**: All classes in chemistry are offered in person. A few classes that still need to be staffed (e.g., adjunct sections) may be listed as To Be Announced (TBA).

- ☐ **CHE 493 Independent Research:** The department is currently accepting applications for CHE 493 Independent Research for students hoping to start research in Fall 2023. This Research Placement Application is due Friday, March 10th by 11:59 pm. Faculty will review applications and determine placements within 10 days of the application deadline. Check your email for more detailed information. Please note that while the application above is only for students beginning research in Fall 2023, all students participating in research will need to register for 493 during the Fall 2023 registration process.

- ☐ **Remember to sign up for Seminar!** Sophomore and Junior Seminar courses (CHE 316 and CHE 317) are held on Wednesday mornings.

- ☐ **Fall 2023 Advanced Option Chemistry Course will be...**
  Dr. Hunt's Medicinal Chemistry course (CHE 474)
  See more information on page 7, especially for any course prerequisites.

- **Looking ahead to Spring 2024...**
  The Advanced Options Chemistry courses being proposed are Molecular Biomimetics with Dr. Parada, and Chemical Biology and Peptidomimetics with Dr. Guarracino. These courses are tentative. See more information on page 8.

- Summer 2023 registration began on November 11, 2022. Winter 2024 registration will continue through the first day of Winter 2024 classes.

Contemplating What Liberal Learning Courses to Take?

Some questions to guide you to the most beneficial Liberal Learning courses:

- Does a course provide you with skills and knowledge that support your major, career, or graduate/professional school?
- Could a course help you explore other potential majors or minors?
- Do you have interests outside your major that you would like to pursue but not necessarily major in?
- Would a course broaden your horizons or provide you with a new perspective?
- What courses might enhance a study-abroad experience or an internship?
- Which courses have topics you find interesting?

Use the Liberal Learning Course Search tool to explore possible liberal learning options.

Specializations in the Chemistry Department

The Chemistry Department offers two specializations that allow students to focus in an area of interest in their upper level courses. Students graduating with a B.S. in Chemistry will have an additional specialization in Material Science or Biochemistry.

Students may apply for a specialization at any time but are encouraged to do so in their sophomore year to facilitate planning and timely completion. To enroll in one of these specializations, students should use the Change of Major Form.

Materials Science Specialization

The Materials Science Specialization is an interdisciplinary program open to chemistry and physics majors in the School of Science who have a strong interest in creating new organic, biological, or inorganic materials and/or exploring the properties and applications of these materials. Students should have a background in chemistry and physics and be comfortable with mathematics. Chemistry students are free to pursue research projects in either the Chemistry Department or Physics Department. Chemistry majors who successfully complete this program will graduate with a Bachelor of Science in Chemistry and a specialization in the Chemistry and Physics of Materials Science. Students will be prepared to pursue a wide variety of careers or graduate study in chemistry, biophysics, or materials science.

To complete the Materials Science specialization, students must complete the following coursework:

1) PHY 306/Mathematical Physics or MAT 229/Multivariable Calculus;

2) PHY 311 – Analog and Digital Electronics or PHY 451 Advanced Lab or CHE 410/Instrumental Analysis; and

3) at least three of the following options courses: PHY 345/Physics of Clouds and Climate, PHY 436/Condensed Matter, CHE 451/Inorganic Chemistry structures and bonding, CHE 478/Special Topics in Condensed Matter (may be taken more than once), and PHY 478/ Photonics, Optics, and Materials. See course listings for additional details. Students must complete at least one options course with a PHY prefix and at least one with a CHE prefix.

Biochemistry Specialization

This specialization is meant for students who are interested in molecular biology, biochemistry, biophysics, bioanalytical, bioorganic, and/or bioinorganic chemistry. Students pursuing this specialization see the interconnectedness of these disciplines, will gain insight into the interdisciplinary nature of chemistry, biology and physics and wish to pursue interdisciplinary postgraduate goals (i.e. in industry, medical, or graduate programs). Students will graduate with a B.S. in Chemistry with a specialization in Biochemistry. The BS may be American Chemical Society (ACS) certified or non-ACS and can be with or without a research intensive focus. To complete the Biochemistry Specialization, students must take the standard chemistry core courses, with the option to take *either* CHE 371 (Quantum Chemistry) *or* CHE 372 (Chemical Thermodynamics). In addition, required Correlate Courses include the standard Math and Physics courses for a B.S. in Chemistry, as well as BIO 201 (Foundations in Biological Inquiry) and BIO 211 (Eukaryotic Cell).

Students are also required to take *either*:

1) two CHE 474 Advanced Topics in Biochemistry courses (including those that may be cross-listed from other CHE 47X) *or*

2) one CHE 474 (or cross-listed CHE 47X) and BIO 471 (Genomics and Bioinformatics) *or*

3) one CHE 474 (or cross-listed CHE 47X) and one BIO 470 Special Topics class from an approved list.

Depending on their degree track, Chemistry majors pursuing the Biochemistry Specialization would have the following additional options course requirements:

ACS w/ Research: One options course at the 300 or 400 level and two units of CHE 493 Independent Research *or* three full units of CHE 493 Independent Research. **ACS**: One options course with a lab at the 300 or 400 level. **Non-ACS**: No options courses are required.

Advanced Options for Fall 2023

CHE 474 Introduction to Medicinal Chemistry
Instructor: Dr. David Hunt
Prerequisites: CHE 332
Text: "Introduction to Medicinal Chemistry", 6th edition, by Graham Patrick (Oxford)

This course will provide an in-depth look at how novel, pharmacologically active molecules are designed to treat diseases. Topics will include selected chapters from the text and additional examples and applications will be drawn from the published literature. Selected case histories throughout the course will serve to illustrate the concepts. There is an associated laboratory to accompany the lecture.

Topics will include:

- Drug discovery
- Molecular design
- Organic synthesis of drug molecules
- Structure-Activity Relationships (SAR) and Quantitative Structure-Activity relationships (QSAR)
- Drug interactions with receptors
- Enzyme inhibition and inactivation
- Pharmacokinetics (PK) and Pharmacodynamics (PD)
- An introduction to toxicology
- Case Histories
- Patents

Looking Ahead to Options Courses for Spring 2024?

Advanced Options will tentatively be:

- **Special Topics - Molecular Biomimetics (CHE 474) with Dr. Parada**
  Prerequisite: CHE 332
  The extraordinary complexity of biological molecules is very difficult to understand. One approach, known as molecular biomimetics, uses lab-made bio-inspired molecules to gain a deeper understanding of biological processes. This course focuses on advances on the understanding of key biological processes using molecular biomimetics, in particular those requiring charge transfer reactivity.

- **Special Topics in Biochemistry - Chemical Biology and Peptidomimetics (CHE 474) with Dr. Guarracino**
  Prerequisites: CHE 332 and Co-requisite: CHE 430 *(permission of instructor required if CHE 430 has not been taken or isn't concurrently being taken, but a background of Biology classes Themes in Biology and Eukaryotic Cell Biology and Biochemistry are established)*

  Chemical biologists use chemical techniques and tools to study, influence and manipulate biological systems of interest. This course takes an interdisciplinary approach to the field of Chemical biology, both in the laboratory and lecture. Class topics will be divided into four main topics under the headings: synthetic biology and biological synthesis, disruption of protein-protein and protein-macromolecular interactions, techniques and assays of chemical biology, and genomics and proteomics. Within these areas, students will learn about synthetic biology, chemical genetics, peptidomimetics, display techniques, expanding the genetic code and creating a synthetic proteome. The laboratory component will be divided into four modules, where students work in teams on a specific project. Students will use bioorganic techniques to synthesize a novel peptide, purify and identify their compounds using standard characterization techniques of mass spectrometry and liquid chromatography, and ultimately will perform the biophysical technique of circular dichroism to examine and compare their peptide's ability to fold into biologically relevant secondary structures. Further testing of these compounds in a biochemical assay to determine antimicrobial activity will occur, time permitting.

Chemistry Department Registration Planning

Date: _____

Name: _____ **Advisor:**

List the courses you plan to take for each semester, paying special attention to the chemistry and correlate courses.

Usual Fall Offerings	Usual Spring Offerings
General CHE201, CHE202 Organic CHE331, CHE332 Analytical CHE310 Thermodynamics CHE372 Inorganic CHE451 Advanced Option CHE47X/452/410 First year seminar CHE099 Sophomore Seminar CHE316 Junior Seminar CHE317 Research CHE493 (requires application)	General CHE202, CHE201 Organic CHE332, CHE331 Analytical CHE310 Quantum Chemistry CHE371 Biochemistry CHE430 Advanced Option CHE370 Advanced Option CHE47X/452/410 Sophomore Seminar CHE316 Junior Seminar CHE317 Research CHE493 (requires application)

FALL		SPRING	
First Year			
Sophomore Year			
Junior Year			
Senior Year			