The College of New Jersey

Chemistry Department

Preregistration Newsletter
for Spring 2022 Registration

Hello Chemistry Majors!

The registration window for Spring 2022 begins November 2nd. 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 Fall 2022?**
- **Meet the New Chemistry Faculty**
- **Chemistry Department Registration Planning Form**

Upcoming Dates to Remember

Mid-semester progress reports	October 13-26, 2021
Advising Window	October 18-November 10, 2021
Last Day to Withdraw	November 2, 2021
Enrollment Period	November 2-12, 2021
Thanksgiving Break	November 24-26, 2021
Last Day of Classes	December 10, 2021

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 Spring 2022, and an unofficial transcript to your advisor prior to your meeting.

- **First years, sophomores, and juniors** are now being advised using a cohort style for additional advising.

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.

The College WAITLISTING PROCESS

Important Notes and Changes

- **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 CHE201, CHE202, CHE331, and CHE332 for Chemistry majors, see PAWS for sections. New this spring semester, we have seats reserved for Chemistry majors in BIO201 who are interested in the Biochemistry Specialization. Seats are spread out among all sections.

- **Course Delivery Mode**: Nearly all classes will be offered in person, but you may see classes in PAWS with a Flex (FX) and remote only (RO) designation. A few classes that still need to be staffed, typically adjunct sections, may be listed as To Be Announced (TBA). If you register for a class as remote only, there is no opportunity to come onto campus for the course. If a course is listed as Flex, the faculty member will decide on how Flex will work and how often you will come into the classroom/lab.

- **CHE 493 Independent Research**
  The department is currently accepting applications for CHE 493 Independent Research for students hoping to start research in Spring 2022. This Research Placement Application is due Tuesday, October 26th by 11:59 pm. Students will be notified of the results by Monday, November 1st. Check your email for more detailed information.
  If you have any questions about this information or procedures for CHE 493 enrollment, please contact your advisor. Please note that while the application above is only for students beginning research in Spring 2022, all students participating in research will need to register for 493 during the Spring 2022 registration process.

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

- **Spring 2022 Advanced Option Chemistry Courses will be...**
  Dr. Ekanger's Bioinorganic Chemistry course (CHE 474) and
  Dr. O'Connor's Sustainable Chemistry in the modern world: A look at catalysis, energy storage, and industrial applications (CHE 478)
  See more information on page 7, especially for the prerequisites for the courses.

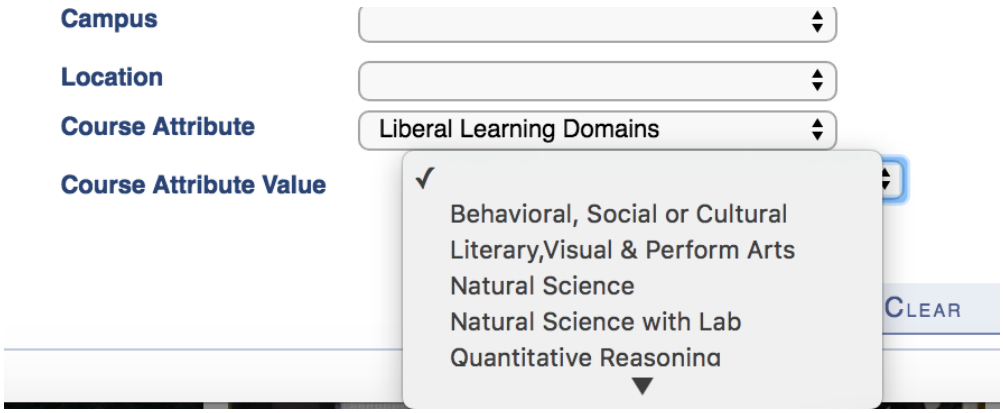
- **Looking ahead to Fall 2022...**
  The Advanced Options Chemistry course being proposed is Bioanalytical Methods with Dr. Hunter. This course is tentative. See more information on page 8.

- Summer 2022 registration will begin November 2. Winter 2022 registration will continue through the first day of Winter 2022 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?

Liberal learning course listings can be found by searching courses in PAWS and setting the "Course Attribute" to Liberal Learning Domains, then setting the "Course Attribute Value" to one of the subdomains. A full list of Liberal Learning courses can be found here.



Specializations in the Chemistry Department

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.

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

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 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.

Students may apply for the specialization at any time but are encouraged to do so earlier, such as in their sophomore year, to aid in planning for timely completion. To enroll in the program, students should formally apply for "Biochemistry" as their specialization using the Change of Major Form.

Advanced Options for Spring 2022

CHE 478 Sustainable Chemistry in the modern world: A look at catalysis, energy storage, and industrial applications

Instructor: Dr. Abby O'Connor

Prerequisites: CHE 332

Texts: None

This course will focus on chemistry topics relevant to society and intersect the areas of materials, inorganic, organic, and analytical chemistry. The overarching theme will be on sustainability and green chemistry principles. The first focus will be on different renewable and non-renewable energy sources, including petroleum, solar, hydrogen, biomass, and others. We will spend time evaluating each and identifying pros and cons, along with issues in implementing these energy sources given our current infrastructure. The course will also cover the topic of energy storage, including different battery types, chemical and thermal methods and challenges in this field. This is timely with the Nobel Prize in chemistry being awarded to lithium ion batteries. The second half of the course will dive into different catalysis methods - photocatalysis, chemical catalysis, and electrocatalysis - and their role in industry and academia. The course will involve lectures, external speakers, discussions, reading and evaluating literature articles, student presentations, and a lab. The lab portion of the course will involve a research style project to encompass the theme of energy and catalysis. No prior inorganic chemistry coursework is necessary for this course.

NOTE: Please ignore the PAWS prerequisites. The main office has already given all junior and senior chemistry majors permission to enroll into this course, please validate your cart before your registration time slot. If for some reason your cart doesn't validate, don't panic! Email Dr. Chan (chemchair@tcnj.edu) before your registration time slot. If the class fills we will open a waitlist for the course.

CHE 474 Bioinorganic Chemistry

Instructor: Dr. Levi Ekanger

Prerequisites: CHE 332

Text: Lippard and Berg, *Principles of Bioinorganic Chemistry.* University Science Books, 1994 (ISBN-13: 978-0935702736)

Bioinorganic chemistry is a field of study at the intersection of biochemistry and inorganic chemistry. This course will focus on the structure, function, and mechanism of metalloproteins and relevant metal complexes. Fundamental concepts from biochemistry and inorganic chemistry will be covered at the outset of this course. The course aims to equip students with a skillset to interpret and critically evaluate current literature in this field. Accordingly, the course will contain lectures, literature discussions and presentations, and a laboratory portion. The laboratory portion of this course will include experiments characterizing metalloproteins, the synthesis and characterization of inorganic coordination complexes intended to model metalloprotein active sites, and computational modeling and analysis on the TCNJ ELSA high-performance computing cluster.

NOTE: Please ignore the PAWS prerequisites. The main office has already given all junior and senior chemistry majors permission to enroll into this course, please validate your cart before your registration time slot. If for some reason your cart doesn't validate, don't panic! Email Dr. Chan (chemchair@tcnj.edu) before your registration time slot. If the class fills we will open a waitlist for the course.

Looking Ahead to Options Courses for Fall 2022?

Advanced Options will tentatively be:

- **Special Topics - Bioanalytical Methods (CHE 474) with Dr. Hunter**
  This course will provide an introduction to modern approaches for the chemical analysis of biological systems. Analytical methods covered will include chromatography, spectroscopy, mass spectrometry, immunoassays, and biosensors. We will discuss how these methods work in addition to assessing the pros and cons of their use for measurements of complex biological samples. The course will involve lectures, discussions, and evaluation of recent primary literature in the field. The lab component of the course will include a research-style project related to the development of a bioanalytical method.

Meet the New Chemistry Faculty

Giovanny Parada, Assistant Professor of Chemistry

Dr. Parada received his Ph.D. in molecular biomimetics from Uppsala University and his B.S. in chemistry from the National University of Columbia. His research focuses on unravelling how nature interconverts different forms of energy with high efficiency via the association of Electron and Proton Transfer reactions, investigating how kinetic and thermodynamic parameters are correlated and ultimately dictate energetic efficiency and mechanistic outcomes of such Proton–Coupled Electron Transfer (PCET) reactions. Dr. Parada's teaching interests span General Chemistry, Analytical Chemistry, Chemical Thermodynamics and Kinetics. In addition to mentoring students on research of Charge Transfer reactivity, he is interested in developing an elective course on the contemporary challenges of Energy and Sustainability.

Wendy Lindsey, Visiting Lecturer in Chemistry

Professor Lindsey teaches general chemistry at TCNJ. Prior to arriving at TCNJ, she received her M.A. in Chemistry and M.Sc. in Materials Science and Engineering from The University of Arizona. She studied surfactant chemistry before switching her research focus to applying analytical techniques to non-destructively analyze tobacco residue on Native American cultural heritage objects in the collection of the Arizona State Museum. In addition to her interest in the intersection of art and chemistry, Professor Lindsey is passionate about improving science education via active learning and inclusive teaching practices. Professor Lindsey is also an avid baker and loves thinking about the way chemistry underpins each facet of baking – from the choice of leavening agent to the relative strengths of different glass baking dishes.

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			