COURSES TAUGHT

**Summer 2014**
- Biochemistry and the Human Body (CHE 111)  
  Billmers  
- Exploring London Through the Eyes of Art and Chemistry (CHE 103)  
  Bradley  
- Organic Chemistry II (CHE 332)  
  Hunt  
- General Chemistry I (CHE 201)  
  Huang  
- General Chemistry II (CHE 202)  
  Krichten  
- Chemical Biology (CHE 170)  
  Chan  

**Fall 2014**
- Orientation to Chemistry (CHE 099)  
  Chan  
- Biochemistry and the Human Body (CHE 111)  
  Billmers  
- First Year Seminar Program-Natural Science (FSP 141)  
  Allison  
- General Chemistry I (CHE 201)  
  Baker, Bunagan  
- Honors General Chemistry I (HON 201)  
  Krichten  
- Analytical Chemistry (CHE 310)  
  Krichten  
- Sophomore Chemistry Seminar (CHE 316)  
  Hirsh  
- Junior Chemistry Seminar (CHE 317)  
  Abourahma  
- Organic Chemistry I (CHE 331)  
  Abourahma, Bradley, Hunt  
- Organic Chemistry II (CHE 332)  
  O’Connor  
- Essentials of Biochemistry (CHE 350)  
  Sen  
- Forensic Chemistry (CHE 360)  
  Allison  
- Chemical Thermodynamics and Kinetics (CHE 372)  
  Hirsh  
- Instrumental Analysis (CHE 410)  
  Huang  
- Biochemistry (CHE 430)  
  Guarracino  
- Special Topics in Organic Chemistry: Medicinal Chemistry (CHE 476)  
  Hunt  
- Student Teaching (CHE 490)  
  Billmers

**Spring 2015**
- General Chemistry II (CHE 202)  
  Baker, Huang, Krichten  
- Honors General Chemistry II (HON 202)  
  Krichten  
- Sophomore Chemistry Seminar (CHE 316)  
  Bradley  
- Junior Chemistry Seminar (CHE 317)  
  O’Connor  
- Organic Chemistry II (CHE 332)  
  Billmers, Bradley, O’Connor, Sen  
- Quantum Chemistry (CHE 371)  
  Bunagan  
- Biochemistry (CHE 430)  
  Guarracino  
- Inorganic Structure and Bonding (CHE 451)  
  Chan  
- Special Topics in Forensic Chemistry: Forensic Applications of Mass Spectrometry (CHE 471)  
  Allison  
- Special Topics in Condensed Matter: Supramolecular Chemistry and Crystal Engineering (CHE 478)  
  Abourahma
INDEPENDENT RESEARCH
CHE 393/493 ENROLLMENTS

Abourahma
Ryan E Boyne
Elizabeth Johnson
Andrew Glass
Alec Grossman

Allison
Courtney Amster
Timothy Castor
Danielle Miller
Luisa Gonzalez

Baker
Mark A Norbury
Jeffrey James Furbish
Susan Knox
Maria Ann Minor
Aleena Andrews
Troy Anthony Brier
Heba Jafri

Bradley
Evan Daniel Li
Shelby Allen
Cristian Ochoa
Jessica Leigh Bocanegra
Taylor Maney
Amy Elizabeth Solinski

Bunagan
Ryan Chin
Michael John Giordano
Michael Pasquale Vermeuel
Daniel James Curran

Chan
Matthew Gole
William Peter McDermott
Lea Palacios
Patrick Pauls

Guarracino
Maria Ann Minor
Kayla Gentile
Susan Knox
Dylan Nguyen

Huang
Kimberly Benitez
Margaret Kathy Chen
Kyle Thomas Webb

Hunt
Andrew Glass
Alec Grossman
Jessica Leigh Bocanegra
Taylor Maney
Amy Elizabeth Solinski

O’Connor
Andrew Ruff
Christopher Kirby
Mia Kunitomo

Sen
Alexis Jones
Taylor Horsfield
2015 CELEBRATION OF STUDENT ACHIEVEMENT

**Abourahma**
Elizabeth J. Johnson
*Kinetic and Thermodynamic Solubility of Pyrazinamide Cocrystals*

**Ryan Boyne**
*Exploiting Cocrystals for Organic Solid State Synthesis*

**Allison**
Danielle Miller
*An Attempt to Identify Iron Oxide Compounds Using MALDI-MS*

**Luisa Gonzalez**
*Vibrations and Things that go Bump in the Night*

**Baker**
Heba Jafri
*Molecular Dynamics Study of the Conformational Dynamics of the F4 Fimbrial Adhesin FaeG*

**Mark Norbury**
*Determining an Effective Computational Protocol for the Simulation of Model Lipid Membranes*

**Bradley**
Evan Li
*Aromatic Silyl Ketones and the Brook Rearrangement*

**Amy Solinski**
*An Unexpected Aromatization Reaction of Cyclohexanedione Ethers*

**Shelby Allen**
*New Methodologies for Making Benzyl Azetidine Compounds*

**Cristian Ochoa**
*Efficient Methods of Synthesizing Benzyl Azetidines*

**Bunagan**
Michael Giordano
*Shifting the Conformational Preference of an Intrinsically Disordered Peptide*

**Chan**
Patrick Pauls
*Metal Coordination Chemistry Research in the Inorganic Chemistry Classroom*

**Matthew Gole**
*Metal Chelation of Pyridine Sulfonamide Ligands*

**Lea Palacios**
*Novel Bismuth Chalcogenides as Potential Thermoelectric Materials*

**Huang**
Margaret Chen
*Effect of Supporting Electrolyte Acidity on the Voltammetric Analysis of Cysteine*

**Kyle Webb**
*The Electrocactivity of Glutathione*
Hunt (on sabbatical leave)
Taylor Mane
Studies Toward the Preparation of Acylated Derivatives of Resveratrol
Ms. Maney was co-supervised by Dr. Bradley

Alec Grossman
Synthesis of Various Functional Groups on Aminobenzophenones
Mr. Grossman was co-supervised by Dr. Abourahma

Jessica Bocanegra
Cu-Catalyzed Reaction of 1-Bromo-2-Iodobenzene and 1,2-Cyclohexanedione
Ms. Bocanegra was co-supervised by Dr. Bradley

Andrew Glass
Heterocyclic Ring Formation Using Cyclohexanone-Based Systems
Mr. Glass was co-supervised by Dr. Abourahma

O’Connor
Catherine Lee
Polymerization of Norbornene Using Cationic (pi-allyl) Nickel(II) Dialkylbiaryl Phosphine Complexes

Christopher Kirby
Catalytic Transfer Hydrogenation of Aryl Aldehydes Using Cp*Ir(III)Cl Pyridinesulfonamide Complexes

Hussnain Sajjad
Progress Towards the Synthesis, Characterization, and Catalysis of Iridium Complexes Containing [N,N,N]-Pincer Type Ligands

Mia Kunitomo
Evaluating the Reactivity of (pi-allyl) Palladium Halides Containing Dialkylbiaryl Phosphine Ligands in Suzuki-Miyaura Coupling Reactions

Sen
Alexis Jones
Disruption of Insect Isoprenoid Biosynthesis with Pyridinium Bisphosphonates

Taylor Horsfield
Active Site Analysis of Lepidopteran Farnesyl Diphosphate Synthase- Implications in Homologous Juvenile Hormone Biosynthesis
SUMMER RESEARCH
SUMMER 2014

Allison
Megan Merbach
Studying Interactions of Artist’s Media (Egg Yolk) with Pigments - Are phosphopeptides Altered?

Bunagan
Ryan Chin
Studying the Folding Pathway of Truncated and Full Length Human Serum Albumin via FCS

Chan
Will McDermott
Discovery of Novel Thermoelectric Materials by the Destruction of the Rock Salt Structure of Bismuth Telluride (Bi$_2$Te$_3$)

Lea Palacios
Discovery of Novel Thermoelectric Materials by the Destruction of the Rock Salt Structure of Bismuth Telluride (Bi$_2$Te$_3$)

Guarracino
Kayla Gentile
Development of ‘Artificial’ Peptides that Bind Collagen as Potential Anti-Thrombosis Agents

Dylan Nguyen
Development of ‘Artificial’ Peptides that Bind Collagen as Potential Anti-Thrombosis Agents

O’Connor
Catherine Lee
Polymerization of Norbornene Using Cationic (Pi-allyl)Ni(II) Dialkylbiaryl Phosphine

Mia Kunitomo
Exploring the Reactivity of Norbornene with (Pi-allyl)Pd Cations Containing Dialkyl Biaryl Phosphines

Andrew Ruff
Synthesis, Characterization, and Catalyst Screening for Cp’Ir Pyridine Sulfonamide Complexes

Husnain Sajjad
Progress Towards the Synthesis of [N,N,N]-Dianionic Pincer Ligands to Stabilize Iridium in High Oxidation States

Sen
Taylor Horsfield
Analyzing the Use of Bisphosphonates as Inhibitors of Farnesyl Diphosphate Synthase in Manduca Sexta

Alexis Jones
Analyzing the Use of Bisphosphonates as Inhibitors of Farnesyl Diphosphate Synthase in Manduca Sexta
Departmental Committee Reports

Academic Affairs
2014-2015 Activities Report
From Danielle Guarracino, 2014-2015 Chair

The Academic Affairs Committee was engaged in several curricular activities. The Committee prepared departmental course schedules for the 2015-16 academic year, reviewed and updated the academic bulletin, revised course descriptions, advising newsletter and program planners, and reviewed transfer and change of major applications. In addition to these annual activities, the Committee reviewed and prepared recommendations related to the following: 1) review of the computational biology minor, 2) development of registration procedures and FAQs, 3) implementation and oversight of CHE493 application process, and 4) preparation of materials for Middle States and ACS Accreditations. The committee will continue to implement the Writing Across the Curriculum proposal and will correlate learning outcomes with current course offerings.

Student Affairs
2014-2015 Activities Report
From Abby O’Connor, 2014-2015 Chair

The Student Affairs Committee was engaged in a wide variety of student-centered activities. The Committee organized several campus events during the academic year, including the new State of the Department assembly and reception, the winter departmental student poster session, the Celebration of Student Achievement lunch and awards ceremony, and the departmental graduation ceremony. In addition, the Committee oversaw the evaluation and distribution of departmental student awards, student admission to Phi Beta Kappa, Goldwater Scholarship nominees, the preparation of two departmental pre-registration newsletters, organization of the department lecture series, and the solicitation and compilation of faculty and student professional activities to be used for the 2014-15 Departmental Annual Report. The Graduation Student Feedback Survey was modified, the 2014 results of this survey were summarized, compared
to 2012 and 2013 results and distributed to the department with suggested action items. A new Travel Contract for students attending professional conferences, and a new bulletin board alerting students to REU, MUSE, internships and employment opportunities were created. Three existing bulletin boards showcasing past award recipients, alumni publications, and alumni location were updated. This committee was especially active in fostering alumni relations through events such as tailgating at Homecoming, an alumni social event in December, and a “Good-bye to the Bridge” gathering during Alumni Weekend; all very well attended. The Student Affairs Committee continues to be particularly active in working with both the Office of Alumni Affairs and the Office of Advancement Services on campus.

Operations
2014-2015 Activities Report
From Donald Hirsh and Heba Abourahma, 2014-2015 Chairs

The Operations committee was engaged in several activities. In addition to preparing IT and renovation requests and overseeing ELF purchases, the Committee reviewed existing instrument service contracts to identify those that could be eliminated, reviewed potential methods to track and categorize general budget purchases, and reviewed the new college guidelines for Industry-TCNJ relations. The committee (with Mirela Krichten as ad hoc member) reviewed the safety handbook with staff from Occupational Safety and developed undergraduate research safety procedures, which were approved by the faculty. In preparation for GHS compliance, the Committee disseminated waste disposal information to the faculty. With the assistance of Joseph Baker, the Department website was updated, new materials prepared and added, and a timeline for future content updates was created.
Student Chemists Association (SCA)
2014-2015 Activities Report
From Taylor Maney, 2014-2015 president

The Student Chemists Association at The College of New Jersey had a very active year. To promote professional development of its members, the club sponsored a variety of different speakers and ACS webinars. Additionally, students had the opportunity to tour the Chemical Heritage Foundation in Philadelphia. SCA members also toured the River Horse Brewery along with the Trenton Local Section of ACS to learn about the chemistry of brewing. Finally, many SCA members were afforded professional development opportunities by attending the 248th and 249th ACS National Meetings in San Francisco and Denver, respectively.

SCA members were actively involved in the department, campus, and Ewing community in the 2014-15 academic year. Chemistry demonstrations were conducted at a variety of local schools, as well as during TCNJ Week of Science, Community Fest, and Alumni Visitation Weekend. Freshman “Happy Hour” Fridays were hosted to help new students in the department acclimate to college life. Students in SCA also offered tours to prospective students during departmental open houses. Periodic Table cupcakes were given away in celebration of National Chemistry Week, and club members held a “Rock Candy Giveaway” during TCNJ Finals Fest to teach students about the chemistry of making candy.

Finally, the Student Chemists Association organized a variety of fun social events for its members, including rock climbing, laser tag, a Halloween costume contest, and a Cards Against Humanity stressbuster. The club’s most successful social events were the Departmental Thanksgiving Potluck and Chemistry Semiformal.

The annual Potluck provides students and faculty the opportunity to interact outside of the classroom environment while enjoying a wide variety of foods. The catered Semiformal was an opportunity for club members to celebrate the end of a great year and bid farewell to graduating seniors. Overall, SCA’s events this year allowed members to reinforce their passion for chemistry outside of the classroom and develop close-knit ties with other students as well as faculty.
Gamma Sigma Epsilon (GSE)  
2014-2015 Activities Report  
From Chris Kirby, 2014-2015 president

During the fall semester, the GSE executive board organized and held the 2014 Initiation Ceremony. Run according to the bylaws of GSE National, the ceremony welcomed 11 inductees into the TCNJ GSE Chapter. The ceremony, which was attended by students, parents, and faculty was held in the Chemistry Building and was followed by refreshments of pizza and cake. Inductees were given certificates and lab coats. During the fall semester, GSE initiated a new tutoring program to serve all students enrolled in Chemistry classes. Every Wednesday, for an hour, 2-3 GSE members were stationed in the Chemistry Student Lounge for drop-in tutoring. This highly successful activity was continued through the spring semester and it is expected that this activity will continue next year. During the spring semester, GSE organized a series of faculty research seminars. These seminars, which were 30 or 60 minutes in length provided underclassman an opportunity to determine what research labs they wanted to apply to work in for CHE 493 credit. GSE expects to schedule additional seminars in Fall 2015. At the end of the spring semester, GSE and SCA jointly planned two social events. The first was a video game night held on Friday, May 1st. Students provided the video game consoles and games which were projected in one of the Chemistry classrooms. On Sunday May 3rd, GSE and SCA held the annual Department Picnic. GSE supplied hotdogs, hamburgers, and veggie burgers for the picnic.

Class of 2015 Graduates

Shelby Allen  
Benjamin Askin  
Kimberly Benitez  
Jessica Bocanegra  
Ryan Boyne  
David Caceres  
Timothy Castor  
Margaret Chen  
Ryan Chin  
Thomas Foster  
Brian Garsh  
Michael Giordano  
Luisa Gonzalez  
Lourdes Guerra  
Taylor Horsfield  
Selina Iqbal  
Elizabeth Johnson  
Alexis Jones  
Justine Kasztelan ^  
Christopher Kirby  
Mia Kunitomo  
Taylor Maney  
William McDermott  
Danielle Miller  
Matthew Morel  
Mark Norbury  
Cristian Ochoa  
Lea Palacios  
Sarah Patterson  
Patrick Pauls  
Hussnain Sajjad  
Amy Solinski  
Michael Vermeuel  
Kyle Webb  
Ammar Zia

^ teaching certified
Student Awards

**Excellence in Chemistry Awards**
Ryan Boyne
Margaret Chen
Alexis Jones
Taylor Maney
Cristian Ochoa
Hussnain Sajjad
Kyle Webb

**ACS Division of Organic Chemistry**
Shelby Allen

**ACS Division of Analytical Chemistry**
Marc Casale (Class of 2017)

**ACS Division of Inorganic Chemistry**
William McDermott

**New Jersey Institute of Chemists**
William McDermott

**Northeastern Chemists Association**
Justine Kazstelan

**American Institute of Chemists**
Michael Vermeuel

**CRC Press Award**
Mia Kunitomo

**Joanne and Robert Billmers Chemistry Education Award**
Andrew Kimball (Class of 2016)

**Joanne and Robert Billmers Chemistry Education Award**
Andrew Kimball (Class of 2016)

**Philip Dumas Memorial Award**
Elizabeth Johnson

**Dr. Jerry Goodkin Physical Chemistry Award**
Lea Palacios

**Mabel Hores Award in Forensic Chemistry**
Timothy Castor

**Goldwater Scholarship Honorable Mention**
Susan Knox
Andrew Ruff (Class of 2016)

**2013-2014 Academic Year Academic Awards**
Top Chemistry Department Freshmen
Marc Casale
Sara Martin
Matt Zajak

Top Chemistry Department Sophomores
William Buchbinder
Andrew Ruff

Top Chemistry Department Junior
William McDermott
Publications 2014-15


Faculty Presentations


Student Presentations

2015

Johnson, E. and Abourahma, H., Kinetic and thermodynamic solubility of pyrazinamide cocrystals. 249th American Chemical Society National Meeting, Denver, CO, March 2015 [Poster presentation].

Sen, S., Jones, A.,* and Horsfield, T. Disruption of insect isoprenoid biosynthesis with pyridinium bisphosphonates. 249th American Chemical Society National Meeting, Denver, CO, March 2015 [Poster presentation].

Sen, S., Horsfield, T.,* and Jones, A. Active site analysis of lepidopteran Farnesyl diphosphate synthase: Implications in omologous juvenile hormone biosynthesis. 249th American Chemical Society National Meeting, Denver, CO, March 2015 [Poster presentation].

Ochoa, C. and Bradley, L.M. Efficient Methods of Synthesizing Benzyl Azetidines. 249th American Chemical Society National Meeting, CO, March 2015 [Poster presentation].


Kirby, C. and O’Connor, A.R. Catalytic transfer hydrogenation of aryl aldehydes using Cp^Irr(III) pyridinesulfonamide complexes. 249th National Meeting of the American Chemical Society, Denver, CO, March 2015 [Poster presentation, selected for SciMix].

This presentation partially funded through an ACS Division of Inorganic Chemistry Student Travel Award.


Sajjad, H. and O’Connor, A.R. Progress towards the synthesis, characterization, and catalysis of iridium complexes containing [N,N,N] pincer type ligands. 249th National Meeting of the American Chemical Society, Denver, CO, March 2015 [Oral presentation].

Maney, T., Sajjad, H., Kirby, C., O’Connor, A.R., and Chan, B.C. The student chemists association at The College of New Jersey. 249th National Meeting of the American Chemical Society, Denver, CO, March 2015 [Poster presentation].

2014


Faculty Grants

Internal Grants

Support of Scholarly Activity award (SOSA), 2014-2016
Heba Abourahma
John Allison
Stephanie Sen

Support of Scholarly Activity award (SOSA), 2015-2017
Joseph Baker
Danielle Guarracino
Abby O’Connor

Mentored Undergraduate Summer Experience award (MUSE), 2014
Michell Bunagan
Benny Chan
David Hunt
Danielle Guarracino
Abby O’Connor
Stephanie Sen

School of Science Mini grant, 2014-2015
Donald Hirsh
David Hunt

Sabbatical Leave, academic year 2015-2016
Benny Chan

AFT Career Development grant, 2014-2015
Heba Abourahma
Joseph Baker
Abby O’Connor

External Grants

Travel Award CIBA/Younger Chemists Committee of the American Chemical Society (ACS). Danielle Guarracino, 2014.


American Chemical Society Petroleum Research Fund.  

Research Corporation for Scientific Advancement.  


National Science Foundation, Division of Undergraduate Education, IUSE: FIRSTS (Foundation for Increasing and Retaining STEM Students) Program– A bridge program to study the sociological development of science identities. PI: B.C. Chan, S. Nayak, L. Gazley, S.M. Pulimood, and S. Vander Sandt. Submitted, January 2015 (recommended for funding).

National Institutes of Health.  
Allosteric modulators of EAAT2 for neuroprotection PI: A.C. Mortensen (Drexel University College of Medicine) Co-PI: J.M Salvino (Drexel University College of Medicine), D. Schnur (Drexel U and TCNJ), and J. Baker. Submitted, February 2015.

National Institutes of Health.  
Allosteric modulators of EAAT2 for neuroprotection PI: A.C. Mortensen (Drexel University College of Medicine) Co-PI: J.M Salvino (Drexel University College of Medicine), D. Schnur (Drexel U and TCNJ), and J. Baker. Submitted, February 2015.

Human Frontier Science Program.  
Exploring the molecular origins of ionic liquid effects on biological membranes. PI: J. Baker, G. Lindberg (Northern Arizona University), and A. Srivastava (Molecular Biophysics Unit, Indian Institute of Science Bangalore). Letter of interest submitted, March 2015.

American Heart Association Grant-in-Aid.  
Departmental Seminars

October 8, 2014
Dr. Malcolm Forbes, Presidential Professor, University of North Carolina Chapel Hill
Photodynamic therapy, toils and troubles: Problems solved with tiny bubbles

November 5, 2014
Dr. Daniel Mindiola, Professor, University of Pennsylvania
Methane activation and dehydrogenation of volatile alkanes C2-C8. Can we do better than burn or crack them?

November 19, 2014
Dr. Paramjit S. Arora, Professor, New York University
Plucking the high hanging fruit: A systematic approach for targeting protein interfaces

February 4, 2015
Dr. Robert Gambogi, Research Director and Fellow, Johnson and Johnson
Lessons learned in consumer healthcare

March 4, 2015
Dr. Nicole Beveridge, Senior Research Chemist, 3M
From bone tissue engineering to industrial adhesives research – the journey from graduate academic research to industry

April 15, 2015
Dr. Gerrick Lindberg, Assistant Professor, Northern Arizona University
Ions at the air-water interface: Determining the pH of interfacial water
Alumni Donors
2014-2015 DONORS

Joseph S. Dolina
Sara E. Davis
Eddy I. Ndichie, Jr.
Kelsey F. VanGelder
Lauren Cordeiro
Thomas E. Robinson
Katherine McGarry
John H. Speigel III

Rebecca E. Gentile
Carly A. Cosentino
Melanie A. Hutnick
Janette A. Eichfeld
Matthew A. Molski
Charles A. Slanovec
Caroline A. Fanslau
Joseph J. Stathius

Alexandra S. Malin
Robert C. Butterhof
Charles W. Hartman
Joseph J. Schramm
Alyssa L. Verano
Lyle C. Nolasco
Apurva N. Sha