ROADMAP TO A PHD DEGREE

KSENIZA D. GLUSAC, GRADUATE COORDINATOR
TOPICS COVERED:

- **Overview of Required Courses**
- **Academic Honesty and Plagiarism**
- **Teaching Responsibilities**
- **Advisor Selection**
- **Rotations**
- **Vacation Policies**
- **English Courses**
COURSES:

- **Two major “core” courses per semester (six total)**

- **Other courses are available if needed (to improve the lacking knowledge in basic chemistry fields or to expand the knowledge needed for research)**

- **Minimum GPA: 3.0 (majority of A’s and B’s).**

- **Talk with your instructor regarding your course progress during the semester.**

- **Success in your coursework can affect your advisor selection**
COURSES IN THE FIRST YEAR (FALL SEMESTER):

CHEM 6140: QUANTUM CHEMISTRY

- Schrödinger equation for simple systems and approximations for larger molecular systems
- Sets the stage for the photochemistry and photophysics (Tarnovsky, PCS 7010) and computational chemistry (Olivucci, part of PCS 7040) courses

CHEM 5660: ORGANIC SPECTROSCOPY

- Application of spectroscopy to study the structure of organic and organometallic molecules.
- IR, UV/VIS, MS, NMR and EPR
COURSES IN THE FIRST YEAR (SPRING SEMESTER):

CHEM 5420: ORGANIC REACTION MECHANISMS

- Mechanistic aspects in organic synthesis
- Reaction types: additions, eliminations, radical reactions, reduction/oxidation reactions, etc.

PCS 7010: PHOTOCHEMISTRY AND PHOTOPHYSICS I

- Primarily photophysics
- Types of excited states, radiative and nonradiative transitions, energy and electron transfer, lasers.

Pavel Anzenbacher

Alexander Tarnovsky
COURSES IN THE FIRST YEAR:

PCS 7810: SEMINARS PHOTOCHEMICAL SCIENCES

- **Fall and Spring semester**
- **Attend departmental seminars.**
- **Fall:** attend group meetings.
- **Spring:** presents a brief seminar (topics covered: several research papers of researchers from BGSU).

ESOL 5040: ENGLISH

- **This course is taken by international students who need to improve their skills of spoken English language.**

- **Some students need to take written English courses in the later semesters (ESOL 5000 and 5010)**
COURSES IN THE FIRST YEAR (SUMMER SEMESTER):

CHEM 6830: PROBLEMS IN CHEMISTRY (HALL LECTURE)

• EVERY YEAR ONE OF THE LEADING SCIENTISTS IN THE FIELD OF PHOTOCHEMISTRY GIVES 3-4 LECTURES DURING THE SUMMER SEMESTER: [http://www.bgsu.edu/departments/photochem/research/heinlen_seminars.html](http://www.bgsu.edu/departments/photochem/research/heinlen_seminars.html)

• AS A REQUIREMENT FOR THIS COURSE, STUDENT NEEDS TO WRITE A REPORT ABOUT THE HALL LECTURE.

• YOUR PhD ADVISOR WILL GRADE THE REPORT

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CHEM 6900: DIRECTED RESEARCH

• YOUR RESEARCH PERFORMANCE DURING THE FIRST-YEAR SUMMER PERIOD WILL BE GRADED.

• AS A REQUIREMENT FOR THIS COURSE, STUDENT NEEDS TO WRITE A REPORT ABOUT THEIR RESEARCH.

• YOUR PhD ADVISOR WILL GRADE.
Courses in the Second Year:

PCS 7020: Photochemistry and Photophysics II

- Primarily photochemistry
- Topics covered: excimers, exciplexes, photooxidations, photoreductions, acid-base and other basic types of photochemistry.

PCS 7040: Special Topics in Spectroscopy

- Single-molecule spectroscopy (Lu)
- Computational chemistry: molecular mechanics, photochemistry, ab initio methods (Olivucci)
- Protein structure analysis and light driven biological functions of proteins (Torelli)

Marshall Wilson

Andrew Torelli

Peter Lu

Massimo Olivucci
COURSES IN THE SECOND YEAR:

OPTIONAL COURSES:

Depending on your research interests, you might decide to take other optional courses, such as:

**CHEM 5450** General Biochemistry I  
**Prof:** Andrew Torelli

**CHEM 5540** Principles of Instrumental Analysis  
**Prof:** Ksenija D. Glusac

**CHEM 5630** Advanced Inorganic Chemistry  
**Prof:** Alexis Ostrowski

**BIOL 6110** Transmission electron microscopy  
**Prof:** Carol Heckman

**PHYS 6010** Techniques in Experimental Physics  
**Prof:** Mikhail Zamkov
PCS 7820: Review of Organic Chemistry

- Taken by students who need to improve their knowledge of organic chemistry
- Two-semester course
- Topics covered: Classes of organic compounds and their reactivity
- Students will attend the organic chemistry lectures for Chem 3410 and 3440 courses (taught by Steven Chung)
- In addition, students will attend recitation sessions once a week (taught by Pavel Anzenbacher).
- This course needs to be taken before Chem 5660 (Organic Spectroscopy)
WHAT IF I HAD A LOW SCORE AT THE PHYSICAL CHEMISTRY ENTRANCE EXAM?

CHEM 5050 AND 5060: PHYSICAL CHEMISTRY

- Taken by students who need to improve their knowledge of physical chemistry
- Two one-semester courses
- Topics covered: thermodynamics and quantum chemistry
- This course needs to be taken before Chem 6140 (Quantum Chemistry)

ALEXANDER TARNOVSKY
EXAMS:

QUALIFYING EXAM:
• At the end of Fall semester of the second year
• Present your research project and results to the PhD committee
• Purpose: Are you making good progress and do you understand the basic aspects and the background literature regarding your research project?

PRELIMINARY EXAM:
• At the end of the Fall semester of the third year
• Present an original research proposal unrelated to your research project to the PhD committee
• Purpose: Can you develop an independent research project that is creative and designed to answer some basic scientific question?
TOPICS COVERED:

• OVERVIEW OF REQUIRED COURSES

• ACADEMIC HONESTY AND PLAGIARISM

• TEACHING RESPONSIBILITIES

• ADVISOR SELECTION

• ROTATIONS

• VACATION POLICIES

• ENGLISH COURSES
WHAT IS ACADEMIC INTEGRITY?

• Moral code in academia

• Honesty about representing source of ideas and knowledge

• Well-known violations:
  - Cheating
  - Plagiarism

• Many other scenarios — consider ‘Academic Integrity Quiz’
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Teaching Assignments

- Teaching assistant in the lab
- Grading (exams and homeworks)
Teaching Assignments

• **You must show up, you must be on time and you must be prepared**

• **Interact with students in the lab while on assignment (do not talk on your cell phone, check your e-mail, talk to your friends...)**

• **Do not date students if you are their TA.**

• **TA awards are available for outstanding teaching assistants (nominated by faculty).**

• **More about the assignments at the Friday meeting with Dr. Mejiritski**
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ADVISOR SELECTION

Tarnovsky

Zamkov

Klosterman

Lu

Olivucci

Ostrowski

Selim
**Advisor Selection**

It is important to find a good match. Things to consider:

- Shared research interests
- Publications
- Funding
- Group members
- Limited slots per faculty (be flexible)
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**ROTATIONS:**

- **Fall Semester:** Visit up to three different research groups
- **E-mail your first rotation choice to Hilda by Wed, Aug 31, 2016.**
  - **Group 1 (required) — September**
  - **Group 2 (required) — October**
  - **Group 3 (optional) — November**

- **Get to know group members**

- **Shadow graduate students**

- **Participate in group seminars**

- **Submit prioritized list of three groups in which you would like to work by end of first week of December.**
Rotations:

Student selects group based on:
- Type of research
- Experience in group visitation

Faculty selects student based on:
- Entrance exam scores
- Grades in first semester courses
- Experience in group visitation

Each faculty member will usually only be able to select one new graduate student each year. So these selections must be made very carefully.
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- **ADVISOR SELECTION**
- **ROTATIONS**
- **VACATION POLICIES**
- **ENGLISH COURSES**
VACATION POLICY:

• **PAID VACATION DAYS/YEAR INCLUDE ALL UNIVERSITY HOLIDAYS AND 14 WORKING DAYS.**

• **STUDENTS ARE REQUIRED TO BE WORKING IN THE LABORATORY BETWEEN TERMS AND DURING SUMMER EVEN THOUGH CLASS IS NOT IN SESSION.**

• **VACATION DAYS MAY BE ACCUMULATED FOR SEVERAL YEARS WITH APPROVAL OF SUPERVISING PROFESSOR.**

• **ALL VACATION DAYS SHOULD BE REPORTED TO GRADUATE SECRETARY**

• **UNIVERSITY HOLIDAYS FOR THE NEXT ACADEMIC YEARS INCLUDE:**
  - **Labor Day** – September 5, 2016
  - **Veteran’s Day** – November 11, 2016
  - **Thanksgiving Day** – November 23-35, 2016
  - **Christmas Day** – December 25, 2016
  - **New Year’s Day** – January 1, 2016
  - **Martin Luther King Day** – January 16, 2017
  - **Independence Day** – July 4, 2017
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• ENGLISH COURSES
ENGLISH COURSES:

TESTING OF STUDENTS

PLACEMENT OF STUDENTS

RESULTS TO GRADUATE COORDINATOR
ENGLISH COURSES:

WRITING CLASSES

ESOL 5000: ACADEMIC COMPOSITION I
Grammar and sentence structure

ESOL 5010: COMPOSITION II
Graduate level writing

SPEAKING CLASSES

ESOL 5030: INTERMEDIATE LISTENING AND SPEAKING
Required for TOEFL scores 20 and below. Students are not cleared to teach. Vocabulary, presentation skills.

ESOL 5040: ENGLISH FOR TAS I
Required for TOEFL scores 21-23
For non-native tutors
Cleared to teach

ESOL 50450: ENGLISH FOR TAS II
Required for TOEFL scores 21-23
Special emphasis on communication
Cleared to teach