ROADMAP TO A PHD DEGREE

KSENJIA D. GLUSAC, GRADUATE COORDINATOR
TOPICS COVERED:

• OVERVIEW OF REQUIRED COURSES

• ACADEMIC HONESTY AND PLAGIARISM

• TEACHING RESPONSIBILITIES

• ADVISOR SELECTION

• ROTATIONS

• VACATION POLICIES

• ENGLISH COURSES
IMPORTANT MILESTONES

1. ADVISOR SELECTION
2. QUAL EXAM
3. PRELIM EXAM
4. DISSERTATION ABSTRACT
5. PhD DEFENSE

years
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 (Tarnovskiy, 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.
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

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)
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
**What if I had a low score at the Organic Chemistry entrance exam?**

**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?**
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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

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 choice to Hilda by Wed, Aug 26, 2015.
  • 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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**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 7, 2015
  - Veteran’s Day – November 11, 2015
  - Thanksgiving Day – November 26, 2015
  - Columbus Day (floating holiday) – November 27, 2015
  - Christmas Day – December 25, 2015
  - President’s Day (floating holiday) – December 28, 2015
  - New Year’s Day – January 1, 2016
  - Martin Luther King Day – January 18, 2016
  - Memorial Day – May 30, 2016
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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