ROADMAP TO A PHD DEGREE

KSENIVA 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

RESEARCH

COURSES

ADVISOR SELECTION

QUAL EXAM

PRELIM EXAM

DISSERTATION ABSTRACT

PHD DEFENSE

years

1 2 3 4 5 +∞
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: 3.2 (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

PETER LU

JEREMY KLOSTERSMAN
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.

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.

Marshall Wilson

PCS 7040: SPECIAL TOPICS IN SPECTROSCOOPY

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

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)
**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’**
TOPICS COVERED:

• OVERVIEW OF REQUIRED COURSES

• ACADEMIC HONESTY AND PLAGIARISM

• TEACHING RESPONSIBILITIES

• ADVISOR SELECTION

• ROTATIONS

• VACATION POLICIES

• ENGLISH COURSES
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**
TOPICS COVERED:

• OVERVIEW OF REQUIRED COURSES

• ACADEMIC HONESTY AND PLAGIARISM

• TEACHING RESPONSIBILITIES

• ADVISOR SELECTION

• ROTATIONS

• VACATION POLICIES

• ENGLISH COURSES
ADVISOR SELECTION

WILSON

SELIM

SUN

TORELLI

OLIVUCCI

ANZENBACHER

LU

KLOSTERMANN

OSTROWSKI

ZAYAK

LEONTIS
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)**
TOPICS COVERED:

• OVERVIEW OF REQUIRED COURSES

• ACADEMIC HONESTY AND PLAGIARISM

• TEACHING RESPONSIBILITIES

• ADVISOR SELECTION

• ROTATIONS

• VACATION POLICIES

• ENGLISH COURSES
Rotations:

- **Fall Semester:** Visit up to three different research groups
  - Submit three choices by **Wednesday, August 27, 2014.**
  - 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.
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.
TOPICS COVERED:

- **Overview of Required Courses**
- **Academic Honesty and Plagiarism**
- **Teaching Responsibilities**
- **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 1, 2014
  - Veteran’s Day – November 11, 2014
  - Thanksgiving Day – November 27, 2014
  - Columbus Day (floating holiday) – November 28, 2014
  - Christmas Day – December 25, 2014
  - President’s Day (floating holiday) – December 26, 2015
  - New Year’s Day – January 1, 2015
  - Martin Luther King Day – January 19, 2015
  - Memorial Day - May 25, 2015
TOPICS COVERED:

- OVERVIEW OF REQUIRED COURSES
- ACADEMIC HONESTY AND PLAGIARISM
- TEACHING RESPONSIBILITIES
- ADVISOR SELECTION
- ROTATIONS
- VACATION POLICIES
- 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