### Ph.D. Program – Pharmacology and Toxicology

#### Benchmarks and Progress
- **Welcome to Department**
  - Diagnostic Exam Review
- **Diagnostic Exam Orientation:**
  - Certifications and Training
  - Meet potential mentors
  - Overview of courses and program
  - Annual pictures and picnic
- **Diagnostic Exam Review**
- **Lab rotations I & II**
  - Attend departmental seminars
  - Choose potential mentor
  - Brief research presentation
  - Present mini-seminar
  - Written qualifying exam I (end of semester)

#### Required didactic courses
- **Fall semester - First year**
  - Principles of Drug Action (2)
  - Biochemistry I (4)
  - Methods and Analysis in Biomedical Sciences (2)
  - Physiological Concepts for Pharmacology (2)
- **Spring semester - First year**
  - Neuropharmacology (2)
  - Biochemistry II (4)
  - Cell Biology (3)
  - PhTx Methods in Pharmacology and Toxicology (2)
- **Summer after 1st year**
  - Statistics (2)
  - Cardiovascular and Renal Pharmacology (2)
  - Endocrine and Metabolic Pharmacology (2)
  - Selective Toxicity and Chemotherapeutics (1)
  - Scientific Writing (2)

#### Other courses
- **Research (2)**
- **Research (1)**
  - Research ethics (1)
- **Seminar (1) - grade**
- **Research (4)**
- **Research (4)**
- **Seminar (1) - pass/fail**

#### Electives (as desired)
- **Lab rotations III & IV (if needed)**
  - Concentrated research
  - Attend departmental seminars
  - Brief Research Report due end of rotations 1 & 2
  - Written qualifying exam II (end of semester)
  - Form Research Committee
  - Present summer research poster at Research/Louisville
  - Brief research presentation (end of semester)
  - Brief Research Report (due end of semester)
  - Written qualifying exam III (end of semester)
  - Attend departmental seminars

#### Final semester
- **Register as Masters Candidate**
  - Apply for M.S. degree
  - Attend departmental seminars
  - Submit MS Thesis and NIH grant of proposed dissertation research to Committee two weeks before defense
  - M.S. defense/Ph.D. Proposal defense/Doctoral oral qualifying exam
  - Write up and publish papers

#### Years 3 & 4 (& 5 if needed)
- **Register as Doctoral Candidate**
  - Concentrated research
  - Meet with Research Committee at least annually
  - Attend departmental seminars
  - Annual presentation of research at Research/Louisville and at regional/national meetings
  - Awarding of M.S. degree

#### Final semester
- **Apply for Ph.D. degree**
  - Finalize dissertation in concert with your mentor
  - Submit dissertation to Research Committee two weeks before defense
  - Ph.D. Defense
  - Revise dissertation if needed
  - Get Committee signatures and submit dissertation to SIGS
  - Conferring of Ph.D. degree
  - CONGRATULATIONS!!