## Ph.D. Program – Pharmacology & Toxicology

### Benchmarks and Progress

#### August Orientation
- Welcome to Department
- Diagnostic Exam
- Orientation:
  - Certifications and Training
  - Meet potential mentors
  - Overview of courses and program
- Annual pictures and picnic
- Diagnostic Exam Review

#### Fall semester
- First year
- Lab rotations I & II
- Submit Research Plan
- Attend departmental seminars
- Choose potential mentor
- Brief Research Presentation (end of rotations 1 & 2)
- Brief Research Report (due end of rotations 1 & 2)
- Written qualifying exam I (end of semester)

#### Spring semester
- First year
- Lab rotation III & IV
- Submit Research Plan
- Finalize mentor choice
- Attend departmental seminars
- Present mini-seminar
- Brief Research Report (due end of semester)
- Written qualifying exam II (end of semester)

#### Summer semester
- First year
- Concentrated research
- Submit Research Plan
- Attend departmental seminars
- Submit summer research abstract to Research!Louisville
- 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

#### Fall semester
- Second year
- Concentrated research
- Submit Research Plan
- Attend departmental seminars
- Submit summer research abstract to Research!Louisville
- 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

#### Spring/Summer
- Second year
- Concentrated research
- Submit Research Plan
- Attend departmental seminars
- Submit summer research abstract to Research!Louisville
- 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

#### Years 3 & 4
- (5, if needed)
- Apply as Masters Candidate
- Apply for M.S. degree
- Attend departmental seminars
- Submit MS Thesis & PhD dissertation proposal (NIH R01 grant format) to Committee two weeks before defense
- M.S. defense/Ph.D. Proposal defense/Doctoral oral qualifying exam
- Revise thesis and/or proposed doctoral research plan if needed
- Submit thesis to SIGS
- Awarding of M.S. degree

- 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

### Required didactic courses

- **Fall semester**
  - Principles of Drug Action: PHTX 660 (2)
  - Advanced Biochemistry I: BIOC 645 (4)
  - Methods & Analysis: Biomedical Sciences: PHTX 652 (2)
  - Selected Topics in Physiology & Biophysics: PH38 616 (2)

- **Spring semester**
  - Neuropharmacology: PHTX 605 (2)
  - Biochemistry II: BIOC 647 (4)
  - Cell Biology: BIOC 667 (2)
  - Research Methods III & IV: PHTX 674 & 675 (2)

- **Summer semester**
  - Topics – Pharmacology & Toxicology: Statistics: PHTX 618 (2)

- **Fall semester**
  - Cardiovascular & Renal Pharmacology: PHTX 656 (2)
  - Endocrine & Metabolic Pharmacology: PHTX 657 (2)
  - Selective Toxicity & Chemotherapy: PHTX 658 (3)
  - Scientific Writing: PHTX 625 (2)

### Other courses

- **Research**
  - Seminar – pass/fail: PHTX 606 (1)
  - Seminar – grade: PHTX 639 (1)
  - Research Ethics: BIOC 630 (1)

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### Electives (as desired)

### CONGRATULATIONS!!