
## UNDERGRADUATE PREREQUISITE COURSES

**Complete all by the end of Year 1**

- Physical Geology
- College Physics 1 Mechanics
- College Physics 2 Other
- College Chemistry 1
- College Chemistry 2
- Calculus 1
- Calculus 2
- Vector Calculus
- Intro Differential Equations
- Fluid Mechanics/Hydraulics
- Statistics for Phys Sci/Engr or Probability Theory

**CODING:** All graduate students are expected to have or to acquire capability for basic coding/computer programming (e.g. Python, MATLAB, Fortran, C++). Semester courses or short courses offered by various departments and the University Information Technology center are available. No graduate credit is granted for this work.

## MASTER’S CORE COURSES + PRIMARY FACULTY ADVANCED ELECTIVE COURSES

**Complete 21 units** (minimum) from Master’s Core and Primary Faculty categories

**Semester of Offering:**
- **f** Fall
- **s** Spring
- **sum** Summer

### Master’s Core Courses
- HWRS 517A Water Quality
- HWRS 518 Subsurface Hydro
- HWRS 519 Surface Hydro
- HWRS 521WR Sys, Plan, Mgmt

### Primary Faculty Advanced Electives
- HWRS 503 Subsurf Fluid Dyn
- HWRS 504 Num Meth Subsurf
- HWRS 505 Vadose Zone Hydr
- HWRS 516 Hydr Transport Proc
- HWRS 524 Hydroclimatology
- HWRS 525 Adv Subsurf Hyd
- HWRS 526 Risk Assessment
- HWRS 528 Wat Res Systems
- HWRS 529 Statistical Hydro
- HWRS 530 Comp Sim WQ Proc
- HWRS 531 Hydrogeology
- HWRS 532 Envir Hydroge Lab
- HWRS 533 Adv Subsurf Hyd
- HWRS 534 Risk Assessment
- HWRS 535 Groundwater Mod
- HWRS 536 Adv Subsurface Hyd
- HWRS 537 Hydr WR Mgmt
- HWRS 538 Isotope Tracers Hyd
- HWRS 539 Water-Rock-Micro
- HWRS 540 Stoch Meth Subsurf
- HWRS 541 Stoch Meth Surface
- HWRS 542 Anlys Hydr Systems
- HWRS 543A Hydrogeology
- HWRS 543B Hydrogeology
- HWRS 544 Water-Quality
- HWRS 545 Water-Quality
- HWRS 546 Water-Quality

### FIELD METHODS/FIELD SYNTHESIS

**Complete 3 units** total in the same calendar year

- HWRS 513A Field Methods (2)
- HWRS 513B Field Synthesis (1)

Prior experience or education may be used to satisfy this requirement, but you must file a petition for approval; however, no academic credit can be awarded. See the Doctor of Philosophy HWRS Program Guide for details.

## OTHER ADVANCED ELECTIVE COURSES

**Complete 12 units** from Primary, Other, and Transfer categories

See Doctor of Philosophy HWRS Program Guide for details. All course work, including Transfer, must be approved by the DGS-Hydrology.

## DOCTORAL MINOR

Select a complementary area of study (see Program Guide) to complete the Minor Plan of Study. Contact the Minor department for specific exam and course requirements (typically 12 units but ranges from 9 to 15 units).

## DISSERTATION: HWRS 920

- HWRS 920 Dissertation: **Include exactly 18 units** total in Plan of Study
- You may need to delete excess 920 units from Plan of Study

## PROFESSIONAL DEVELOPMENT

- HWRS 595A Current Topics in Hydrology & Atmospheric Sciences; the Weekly Colloquium - All Graduate Students (MS & PHD) must enroll for at least one semester (1-unit maximum per semester) during academic residency but **do not include** in Plan of Study
- Near end of academic residency, make **two** (2) presentations of dissertation research at approved regional, national, or international conferences
- Of two (2) required presentations, **minimum 1 oral presentation**
- Submit email memo with details (see PHD HWRS Program Guide) to DGS-H
ACADEMIC PROGRESS BENCHMARKS + FORMAL EXAMS
See Doctor of Philosophy HWRS Program Guide for details

YEAR 1 Second Sem: Take Doctoral Qualifying Examination – Major, Minor (if any)
YEAR 2 End: Submit Doctoral Plan of Study by the end of 4th semester to allow time for adjustment or revision (e.g. take additional course units if necessary)
YEAR 2.5 to 3: Initiate Doctoral Comprehensive Examination Process – 1) Major Written, 2) Minor Written (if any), and 3) Combined Oral in Major and Minor
YEAR 4 End: Take Doctoral Final Oral Examination-Dissertation Defense

DOCTOR OF PHILOSOPHY GRAD PATH FORMS

Once matriculated into a degree program, Continuous Enrollment is required (fall/spring, fall/spring)—see Graduate Catalog for policies. Summer enrollment is not required except in cases where a financial aid sponsor, visa sponsor, or other entity requires enrollment for the diploma term (August). Otherwise, the diploma terms are spring (May) and fall (December). The PHD degree program has a 10-Year CLOCK which begins with the earliest coursework.

Login to Student Access to complete required forms

Responsible Conduct of Research Statement
- All students must complete this form. Additionally, an RCR Workshop is required for anyone funded by NSF, NIH, or NIFA grants.

Doctoral Plan of Study
- List all course work for Major and Minor plus exactly 18 dissertation units
- Delete 595A (weekly colloquium) and any excess 920 Dissertation units
- Submit by end of Year 2/fourth semester in residence

Comprehensive Exam Committee Appointment
- File after ALL course work has been completed
- List all members of Major and Minor committees (no Special Members)

Announcement of Doctoral Comprehensive Exam
- After completion of written exams, submit this form to announce the oral exam (closed exam, not open to the public)

Results of Comprehensive Exam
- Faculty dissertation director submits e-form after oral exam
- Comp Exam 5-YEAR CLOCK starts: Complete all degree requirements within next 5 years or begin Comprehensive Exam process again

Prospectus/Proposal Confirmation
- First, submit a draft copy of dissertation abstract (does not have to be the final product) to the Program Coordinator for your file
- Then submit the Prospectus/Proposal form (department will confirm)

Doctoral Dissertation Committee Appointment
- List all members of Major and Minor, if any, who will participate in final oral exam (dissertation defense)
- Request Special Member, if any, with Program Coordinator

Announcement of Final Oral Defense
- Submit at least 10 business days in advance
- List date, time, and location of dissertation defense
- List all committee members who will participate (Minor may opt out)
- Graduate College will announce the exam in the UA Master Calendar because the initial presentation is open to the public

Results of Final Oral Defense
- Faculty dissertation director will submit e-form after the exam
- Result will be reported as Pass Without Revision, Pass With Revision, or Fail (one re-take is allowed—see PHD HWRS Program Guide for details)

After making all required revisions (if any) to the dissertation manuscript, you must submit your dissertation to the Graduate College for the ProQuest/UMI digital archive. The Student Academic Services liaison will assist you with this process.

Other Forms

Transfer Credit
- A maximum of 12 graduate units of course work taken while in a degree program (approved by DGS-H) may be transferred from another university for use in the major Plan of Study
- No more than 12 graduate units taken in a non-degree status may be used

Graduate College Petition (used for a variety of reasons)
- Petition for a leave of absence (temporarily suspends Continuous Enrollment requirement but the CLOCKS do not stop)
- Petition for extension of time to complete a course
- Petition for extension of time to complete the degree program

Read more at: schedule.arizona.edu | catalog.arizona.edu | has.arizona.edu/graduate-information | has.arizona.edu/professional-development | has.arizona.edu/professional-careers