Dual Degree Program

Graduate Interdisciplinary Program in Neuroscience

University of Arizona

The MD/PhD Dual Degree Program in Neuroscience prepares students for academic careers involving research and teaching and clinical service, as well as other careers where biotechnology training is required.

The Association of American Medical Colleges summarizes the objective of an advanced dual degree: "The MD/PhD training organizes the experimental and clinical thinking of the physician-scientist. This synergy enables a physician-scientist to recognize new ways that clinical care or the understanding of disease mechanisms will benefit from research and to mount the appropriate effort. Likewise, the synergy achieved in dual-degree training enables the physician-scientist to see how the results of research discoveries and insights can be converted into clinically significant outcomes."

The goal of the University of Arizona MD and Neuroscience PhD Dual Degree Program is to provide outstanding aspiring physician scientists with biomedical training so that they emerge as leaders in both academic medicine and research. Students accomplish this by spending the first two academic years exclusively in the College of Medicine, followed by 4 years of interdisciplinary doctoral training in neuroscience. Upon successful completion of a PhD dissertation, students then return to the College of Medicine and complete their final two years of clinical training.

Candidates are admitted independently to the College of Medicine and the Graduate Interdisciplinary Program in Neuroscience. Although the time to completion of both programs, combined is usually nine years, the Neuroscience PhD/MD Dual Degree Program makes it possible to complete both degree objectives in 8 years. This is accomplished by giving credit for certain units of College of Medicine courses towards the Neuroscience study program.

Dual Degree Requirements

Dual degree applicants must meet the application deadlines and testing requirements to each program independently. Students pursuing the dual degree will spend the first two academic years exclusively in the College of Medicine.

After spending the first two academic years exclusively at medical school, students pursuing the dual degree program will complete their Ph.D. graduate course work and dissertation research before completing their clinical requirements at medical school.

Fees

Effective Fall 2017, students in officially approved dual-degree programs will receive one charge for the combined program, rather than two partial charges. Before that, students will be charged the fee/tuition of that program in which they are enrolled. For example, COM fees would be charged in years 1 and 2. The Program Coordinator for the student's first program/year will be responsible for letting the bursar's office know the enrollment status of the student.

Doctor of Neuroscience PhD Requirements

Doctoral students must complete a minimum of 63 units of graduate-level coursework. 36 total units must be completed in the major subject area (18 units in the major must be taken as letter-grade and must be courses at the 500-level or greater), 9 units in the minor field and 18 units of dissertation research.

Combined Credit – Units credited to both degrees

Medical course credits will be counted as 1/1 to graduate credits.

Nine units of Medical School curriculum will be accepted by the Graduate College as counting towards the PhD in Neuroscience and 10 credits will be accepted towards the minor.

Students seeking a Ph.D. in Neuroscience degree will successfully complete the following credit requirements with a grade of 3.0 or better GPA. The course work required for the PhD degree is a total of 72 credits.

Requirements

Core Courses

- NRSC 588, Principles of Cellular and Molecular Neurobiology — 4 units
- NRSC 560, Systems Neuroscience — 4 units
- NRSC 701 Communications in Neuroscience (or equivalent) and NRSC 695e Science, Society & Ethics — 2+1 units
  - or PS 595B Science Writing Strategies, Skills & Ethics — 2 units
  - or SLHS 649 – Survival Skills and Ethics, — 3 units
- Statistics (options: EPID 576A/B, PSYC 507A/B/C, RNR 613 — 3-4 units

Elective Courses

Elective courses (see: www.neuroscience.arizona.edu/curriculum) must add up to a minimum of 36 units (not including dissertation research and independent study). At least half of the 36 units must be taken for a letter grade (not pass/fail).

Additional courses of interest that are not listed can be accepted after confirmation with the student's Advisory Committee

Minor Courses (9 units minimum)

MED courses 9 units

Research Rotations

Students are required to complete two research rotations (NRSC 700, Research Rotations, 2-4 units), which can be taken during year 2 in the combined program.

Teaching Requirement

Students are required to teach for one semester in a course that complements their interests.

Seminars

Students are required to attend seminars and journal clubs by enrolling in NRSC 695F/G Neuroscience Colloquium (1-2 units).

Research

NRSC 900 (year 1) Research

NRSC 920 (year 2) Dissertation

PhD Courses	**Credits**
Principles of Cellular and Molecular Neurobiology (NRSC 588)	**4**
Systems Neuroscience (NRSC 560)	**4**
Scientific Writing & Ethics (options: NRSC 701 and 695e, or PS 595B, or SLHS 649)	**3**
Statistics (options: EPID 576A/B, PSYC 507A/B/C, RNR 613)	**3-4**
Neuroscience Colloquium NRSC 695F (2 units per semester in year 1-2)	**8**

Neuroscience Colloquium NRSC 695G (1 unit per semester in year 3-5)	**6**
Elective Neuroscience Coursework (to complete 36 units for major)	**x**
Research Rotations NRSC 700 (2-4 unit per semester in year 1)	**8**
Research NRSC 900 (4-8 units in year 2-4)	**24**
MD Courses used for electives in major field (MED 803)	**9**
MD Courses used for minor field (MED 802, MED 804, MED 805, MED 806A/B, MED 807, MED 808, MED 809)	**10**
Dissertation NRSC 920 (9 credits per semester for 2 semesters)	**18**
TOTAL	**>72**

Sample Plan of Study for Dual Degree MD/PhD Neuroscience

Year One	***First Year Medical School Curriculum*** **MED 802** - Foundations (9 weeks) **MED 803** - Nervous System (9 weeks) **MED 804** - Musculoskeletal System (5 weeks) **MED 805** - Cardiovascular, Pulmonary, Renal Systems (12 weeks) **MED 806A DMH A** - Digestion, Metabolism & Hormones (3 weeks) Courses may be used for graduate credit upon request and approval.
Year Two	***Second Year Medical School Curriculum*** **MED 806B DMH B** - Digestion, Metabolism & Hormones (12 weeks) **MED 807** - Immunity and Infection (9 weeks) **MED 808** - Life Cycle (9 weeks) **MED 809** - Advanced Topics (7 weeks) Complete Step 1 United States Medical Licensing Exam (USMLE) Courses may be used for graduate credit upon request and approval. **NRSC 700** – Research rotation (a total of 2 are required)
Year Three	***First year PhD in Neuroscience Curriculum*** **NRSC 588** – Cellular & Molecular Neurobiology (fall semester) **NRSC 695F** – Neuroscience Colloquium (both semester) **NRSC 560** – Systems Neurobiology (Spring Semester) Science & Ethics Course (either semester) Statistics Course (either semester) Elective & minor courses (both semesters) Comprehensive Exam (end of Spring semester)
Year Four	***Second year PhD in Neuroscience Curriculum*** **NRSC 900** – Research (both semesters) **NRSC 695G** – Neuroscience Colloquium (both semesters)
Year Five	***Third year PhD in Neuroscience Curriculum***

	NRSC 900 – Research (both semesters) **NRSC 695G** – Neuroscience Colloquium (both semestesr)
Year Six	***Fourth year PhD in Neuroscience Curriculum (as needed)*** **NRSC 920** – Dissertation (both semesters) **NRSC 695G** – Neuroscience Colloquium (both semesters) Dissertation and Defense
Year Seven	Clinical Clerkships Transition to Clerkships (1 week) Intersessions (2 weeks) Required Clerkships The seven required clerkships are organized into four blocks: Neurology Clerkship (3 weeks) and Psychiatry Clerkship (6 weeks) plus 3 weeks of elective time or a 3-week Surgery Subspecialty Selective Obstetrics and Gynecology Clerkship (6 weeks) and Surgery Clerkship (6 weeks) Medicine Clerkship (12 weeks, with two, 4-week blocks of inpatient medicine and one, 4-week block of ambulatory medicine) Pediatrics Clerkship (6 weeks) and Family and Community Medicine Clerkship (6 weeks) Complete Step 2 United States Medical Licensing Exam (USMLE)
Year Eight	Continue Clinical Clerkships Sub-internship selective (4 weeks) in a core discipline including internal medicine, general surgery, pediatrics, obstetrics and gynecology, emergency medicine or family medicine. Emergency Medicine or Critical Care selective (4 weeks) Surgery Subspecialty Selective (3 weeks) in any subspecialty (if not completed in Year 3) Elective courses (24 weeks) Enter the Residency Match Process Complete Residency Interviews