NDSU NORTH DAKOTA STATE UNIVERSITY

STUDENT FOCUSED • LAND GRANT • RESEARCH UNIVERSITY

What is a Pharmacist?

- A pharmacist is a drug therapy expert who works with physicians, dentists and veterinarians to help ensure the effective, safe, and cost-effective use of medications for patients.
- Some pharmacists may also specialize in disease state management, pharmaceutical research, education, or in marketing and sales of particular medications for a company.
- Many in this field work in hospitals, clinics, nursing homes, or community pharmacy settings taking care of the medication needs of patients.
- They are specialists in their knowledge of medications, their appropriate use, and must always be furthering their education in this area since new medications are developed all the time.

Practice Settings

- Community Pharmacy Practice
- Hospital & Ambulatory Clinics
- Managed Care Pharmacy
- Specialty Pharmacy
- Compounding Pharmacy
- Research or Industry
- Academic Pharmacy
- Personalized Medicine
- Specialized Fields of Pharmacy

Pharmacy Programs

- **Doctor of Pharmacy (Pharm. D.)**
  - 2-3 pre-professional years (~80 credits) and 4 professional years (150 credits)
- Pharm D/MBA
- Masters Degree in Pharmaceutical Sciences
- Pharm D/ PhD
- PhD Pharmaceutical Sciences
- Masters Degree in Public Health

What is the Difference Between a Pharm.D and Ph.D.?

- The Ph.D. degree program trains you to conduct basic research in the areas of (among other topics) new drug development and medication delivery systems.
- Strong emphasis is placed on acquisition of research skills, experimental design, data analysis, and analytical techniques in the pharmaceutical sciences.
- The Pharm.D. program trains individuals to become patient care specialists in clinical pharmacy practice related to managing medications in various disease states. That is, the Pharm.D. is a practice-oriented degree, similar to a M.D. (physician) or a D.D.S. (dentist), but whose expertise is the safe and effective use of medications.
- Graduates of the Pharm.D. program become eligible to practice pharmacy upon passing all relevant licensure examinations.

Admission to the Ph.D. in Pharmaceutical Sciences Program

- Students must earn a bachelor degree or higher from an accredited institution of higher education in a science related field.
- Examples include:
  - Chemistry
  - Biochemistry
  - Microbiology
- More details on the Ph.D. program can be found at: https://www.ndsu.edu/pharmacy/graduate_students/

Admission to the Pharm.D. Program

- There are two routes for aspiring high school students to pursue admission to NDSU's Pharm.D. program.
- Option 1: The Early Admission Pathway
- Option 2: The Traditional Admissions Pathway

Early Admission Pathway (EAP) to NDSU's Pharm.D. Program

- **Designed for academically qualified high school students who want an affordable, expedited path to a Pharm.D. degree**
- **Apply during your senior year in high school**

- **Conditionally accepted to the Pharm.D. program**
  - **You have a <u>guaranteed</u> spot in the Pharm.D. program as long as you meet the requirements**
  - **You must complete all requirements to maintain your spot**
- **If you meet program requirements, it is a guaranteed 6 year path (saves up to 2 years of time in college)**

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Early Admission Pathway (EAP) to NDSU's Pharm.D. Program

- **The curriculum is challenging, but progressive and designed specifically to ensure that you are trained well for NDSU's Pharm.D. program**

- **First year, standard undergraduate, pre-professional courses**
  - **Pay standard undergraduate tuition**
- **Second year, start transition into the professional Pharm.D. program as you complete your pre-professional requirements**
  - **Pay differential pharmacy tuition**
- **Next 4 years: Traditional Pharm.D. program**
  - **Pay differential pharmacy tuition.**

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Admission to the EAP - Pharm.D. Program

- **High School Performance**
  - **ACT/SAT composite scores (Primary Criterion)**
  - **ACT/SAT sub-section scores (Secondary Criterion)**
  - **High School GPA (Secondary Criterion)**

- **Competitive applicants have ACT/SAT composite scores in the top 25% nationally and high school GPAs of 3.50 or higher**

- **55-65 students will be accepted into this program annually**

Admission to the EAP - Pharm.D. Program

- **Once accepted, students must:**

- **Complete all required classes with grades of "C" or higher**
- **Keep a cumulative GPA above 3.00 (most students have GPAs above 3.40)**
- **Complete the PCAT at the end of your first year of college with a minimum score threshold**
- **Complete all Interview Day activities with minimum scores**

Early Admission Pathway (EAP)
Two Year Pre-Pharmacy Curriculum

6/2017

NDSU ENTRY-LEVEL PHARM. PROGRAM
New Admission Pathway Pre-Pharmacy Curriculum
2018-2019

Two Year Track (4 Semesters + 1 Summer Session; 81 credits which includes 3 cr. for Engl 110)

FIRST YEAR (43 credits)			
FALL	**Cr**	**SPRING**	**Cr**
Biol 150/150L, General Biology I/Lab *	3/1	Biol 151/151L, General Biology II/Lab *	3/1
Chem 121, General Chemistry I *	3	Chem 122, General Chemistry II *	3
Chem 121L, General Chemistry I Lab	1	Chem 122L, General Chemistry II Lab	1
English 120, Comp II[1] *	3	Comm 110, Fundamentals *	3
Math 146, Applied Calculus I *	4	Econ 201, Microeconomics *	3
CHP 190, Critical Thinking	2	Stat 330, Introductory Statistics *	3
	17		17

SUMMER SESSION – PCAT Exam
Elective – Humanities and Fine Arts, 6 Credits

[1] Students who complete English 120 with a "C" or higher will receive credit for English 110 with a passing grade (P).

SECOND YEAR (35 credits)			
FALL	**Cr**	**SPRING**	**Cr**
PSCI 391, Seminar in Pharmaceutical Organic Chemistry	5	PSCI 499, Special Topics in Pharmaceutical Biochemistry	5
Biol 220/220L, Human Anat & Physio I *	3/1	Biol 221/221L, Human Anat & Physio II	3/1
Comm 216, Intercultural Comm *	3	PHRM 324, Professionalism in Pharmacy (with Pharmacy Interviews)	3
Micr 202/202L or 350/350L$^{\phi}$ *	2/1	Micr 460, Pathogenic Microbiology	3
Wellness	2	Phys 211, College Physics I	3
	17		18

φ Students who complete Microbiology 350 and 350L take an additional two credits of coursework. These students would then complete 19 credits during this semester.

(ALL courses must be completed with at least a grade of "C.")

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Admission to the Traditional Admission Pathway to the Pharm.D. Program

- **Each year, the Pharmacy Admissions Committee will accept 20-30 students through a traditional pathway.**

- **Beneficial for students**
  - **with certain family financial situations**
  - **who switch from other majors on campus to pharmacy**
  - **who want to earn a minor or study abroad**

- **Three years of traditional, pre-professional coursework**
  - **Standard undergraduate tuition, take standard undergraduate courses instead of unique EAP courses.**

Traditional Admission Pathway
Three Year Pre-Pharmacy Curriculum

NDSU ENTRY-LEVEL PHARM.D. PROGRAM
Pre-Pharmacy Curriculum
2018-2019

Three year track. Allows room for a minor of study. (6 Semesters; 104 credits which includes 3 cr. for Engl 110)

FIRST YEAR (33 credits)			
FALL	**Cr**	**SPRING**	**Cr**
Biol 150/150L, General Biology I/Lab *	3/1	Biol 151/151L, General Biology II/Lab *	3/1
Chem 121, General Chemistry I *	3	Chem 122, General Chemistry II *	3
Chem 121L, General Chemistry I Lab	1	Chem 122L, General Chemistry II Lab	1
English 120, Comp II[1] *	3	Comm 110, Fundamentals *	3
Math 146, Applied Calculus I *	4	Elective – Humanities & Fine Arts	3
CHP 190, Critical Thinking & Academic Success	2	Wellness	2
	17		16

[1] Students with composite ACT scores of 20 or lower must register for English 100 and 110 Fall Semester and take Engl 120 Spring Semester. Students who complete English 120 with a "C" or higher will receive credit for English 110 with a passing grade (P).

SECOND YEAR (33 credits)			
FALL	**Cr**	**SPRING**	**Cr**
Biol 220/220L, Human Anat & Physio I *	3/1	Biol 221/221L, Human Anat & Physio II	3/1
Chem 341, Organic Chemistry I *	3	Chem 342, Organic Chemistry II	3
Chem 341L, Organic Chemistry I Lab	1	Econ 201, Microeconomics *	3
Comm 216, Intercultural Comm *	3	Phys 211, College Physics I	3
Elective – Humanities & Fine Arts	3	*Credits towards Minor*	3
Credits towards Minor	3		
	17		16

THIRD YEAR (35 credits)			
FALL	**Cr**	**SPRING**	**Cr**
Bioc 460, Biochemistry I	3	Bioc 461, Biochemistry II	3
		Engl 324 or 325, Upper Division English	3
Micr 350/350L or 202/202L *	3/2		
Stat 330, Introductory Statistics *	3	Micr 460, Pathogenic Microbiology	3
Credits towards Minor	6	*Credits towards Minor*	9
	17		18

***Selected core courses will be used for selection criteria to determine GPA used in calculation for admission to the professional program. These courses must show evidence of letter grade, or other means of demonstrating acceptable competency (i.e. AP – CEEB) and MUST be completed by the end of fall semester prior to the December 31 deadline to apply to the pharmacy program. Remaining courses, which are required and listed in the pre-pharmacy curriculum, MUST be completed by the end of spring term.**

(ALL courses must be completed with at least a grade of "C.")

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Admission to the Traditional Admission Pathway to the Pharm.D. Program

- **Apply during the third undergraduate year**
- **Selected Grade Point Average** (GPA) in college-level, core courses (minimum is 3.0)
- **PCAT**
- **Interview Day Activities**

Admission to the Traditional Admission Pathway to the Pharm.D. Program

- Average GPA in select Pre-Pharmacy courses
  (2017: approximately 3.65 for traditional pathway applicants)

- PCAT composite percentile
  (2017: approximately the 65th percentile for traditional pathway applicants)

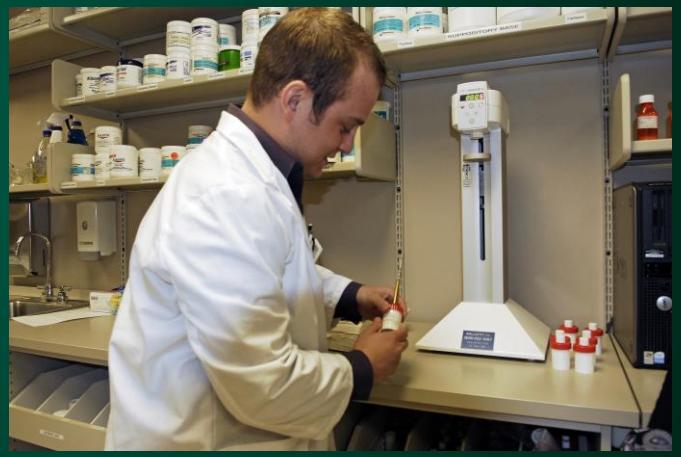
- Interview
  (Approximately 50 qualified applicants will be selected for interviews each year)

Admission to the Traditional Admission Pathway to the Pharm.D. Program

- Admission applications are available on-line through Pharm-CAS by November 1 each year.
- PharmCAS fees apply
- Additional application fee for the Pharm.D. program is $125.

Pharmacy College Admission Test (PCAT)

- Subtests
  - Biological Processes
  - Quantitative Ability
  - Chemical Processes
  - Writing
- Measures general academic ability and scientific knowledge
- Approximately 200 multiple-choice questions and a writing prompt
- 4 1/2 hours long
- Can be taken more than once
- Highest score is the one considered
- PCATweb.info
- Approximately $210 per test



Demand for Graduates

- **E**mployment rate for graduates (within a few weeks of graduation) for students in the College average 92% according, to the 2014 employment report by the NDSU Career Center (http://www.ndsu.edu/fileadmin/career/2014annualreport.pdf).

- U.S. Department of Labor's Bureau of Labor Statistics job opportunities in pharmacy are expected to **grow faster than average**.

- *Average Salary: $121,701
  - Salaries will vary depending on whether you practice in a clinical setting, a community setting, a rural community or an urban community.

*U.S. Bureau of Labor Statistics, May 2017 National Occupational Employment and Wage Estimates; https://www.bls.gov/oes/current/oes_nat.htm#29-0000. All estimates use annual mean wages.

Starting Now

- Take advantage of opportunities to learn more about science
- Job shadow
- Research colleges and universities
- Visit colleges and universities
  - Specifically ask to meet with the departments that house your programs of interest
  - Compare programs from school to school

Costs of Education

- NDSU remains one of the most affordable places to earn a Pharm.D. degree.
  - In-State Undergraduate Tuition: $7,957
  - In-State Differential Tuition: $15,497
  - Tuition for MN residents is only slightly higher than in-state

- Compare to the University of Minnesota-Twin Cities
  - In-State Undergraduate Tuition: $14,760
  - In-State Differential Tuition: $26,520

Costs of Education

- NDSU remains one of the most affordable places to earn a Pharm.D. degree.
  - In-State Undergraduate Tuition: $7,957
  - In-State Professional Pharm.D. Differential Tuition: $15,497
  - Tuition for MN residents is only slightly higher than in-state

- Compare to South Dakota State University
  - In-State Undergraduate Tuition: $7,440 (varies by credit load)
  - In-State Professional Pharm.D. Differential Tuition & Program Fees:

    Varies by year

    ~$18,000 for years 1 – 3

    ~$26,000 for year 4

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How to Apply

- For Traditional Pathway applicants, simply apply to study as an undergraduate at NDSU and declare a "pre-pharmacy" major.
  - See: https://www.ndsu.edu/admission/apply
  - Complete PharmCAS application your junior year in college
- For Early Admission Pathway applicants, apply to study as an undergraduate at NDSU.
  - See: https://www.ndsu.edu/admission/apply
  - Complete NDSU's EAP application in PharmDirect as a senior in high school
  - See: https://pharmdirect.liaisoncas.com/applicant-ux/#/login