

Western University of Health Sciences

College of Pharmacy

**Master of Science in Pharmaceutical Sciences (MSPS)**  
**2017/2018 Catalog**

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# College of Pharmacy

## *Master of Science in Pharmaceutical Sciences*

### Accreditation

Western University of Health Sciences is accredited by the Senior College and University Commission of the Western Association of Schools and Colleges (WASC). WASC's statement of accreditation status can be found at <http://www.wascsenior.org/institutions/western-university-health-sciences>. You may contact WASC at 985 Atlantic Avenue, Suite 100, Alameda, CA 94501. Phone: (310) 748-9001, Fax: (310) 748-9797, E-mail: [wascsr@wascsenior.org](mailto:wascsr@wascsenior.org). WASC is a non-profit organization that evaluates the quality and educational effectiveness of schools, colleges and universities. WASC is one of six regional accreditation agencies in the United States. While it is not officially regulated by the government, it is regularly reviewed by the US Department of Education and the Council for Higher Education Accreditation.

### Complaints Regarding WASC Accreditation Standards

Western University of Health Sciences is committed to meeting and exceeding the standards for accreditation of colleges and universities as described by the Accrediting Commission for Senior Colleges and Universities of the Western Association of Schools and Colleges (WASC). It is the policy of Western University of Health Sciences that a student, employee, or other constituent of the University that believes that the University may not be in compliance with the standards of accreditation has a right to file a complaint and can view the complaint submission process at: <http://www.wascsenior.org/comments>.

### General Information

#### Program Mission & Goals

The mission of the MSPS program is to produce pharmaceutical scientists who discover and advance scientific knowledge that leads to improved human health and quality of life.

The following are the programmatic goals:

- To build a quality student body that meets the goals of the College
- To deliver a unique and innovative curriculum balanced in coursework and research opportunities that prepare students for careers in pharmaceutical sciences
- To contribute to the advancement of science and the understanding, prevention, and treatment of disease

### Program Overview

A minimum of 40 semester credit hours is required for completion of the MSPS program. This includes 20 hours of didactic study and 20 hours of research credits, leading to a thesis. The program emphasizes research in pharmaceutical sciences.

#### Program Faculty

Program faculty are part of the Department of Pharmaceutical Sciences in the College of Pharmacy. Their areas of research emphasis include pharmacology, pharmaceuticals, pharmacokinetics, drug metabolism, pharmacogenomics, toxicology, molecular immunology, virology, antimicrobial agents, cancer therapy, neuroscience and neuropharmacology, and pharmaceutical formulation and drug design.

## Admissions Policies and Procedures

### Non-Discrimination Policy

In accordance with all applicable federal, state and local laws, Western University of Health Sciences (WesternU) is committed to ensuring a campus community free from unlawful discrimination. Accordingly, WesternU prohibits unlawful discrimination on the basis of race, color, national or ethnic origin, religion or religious creed, sex or gender (including gender identity or expression), marital status, sexual orientation, disability, age, genetic information, military or veteran status, or any other characteristic protected under applicable law, in the administration of its programs or activities. WesternU also prohibits unlawful harassment, including sexual harassment. Lastly, WesternU is committed to providing equal access and equal opportunities to all members of its campus community in accordance with all applicable laws.

This non-discrimination policy applies to applicants, students and alumni. Additional nondiscrimination information can be found in the Nondiscrimination, Anti-Harassment and Anti-Retaliation Policy, located in the University Catalog.

### Reasonable Accommodation for Disabilities

Candidates and students must be able to perform all the essential functions of the program with or without reasonable accommodation. A student who discloses a disability and requests accommodation will be referred to the Harris Family Center for Disability and Health Policy (CDHP). The student will be asked to provide documentation of the disability for the purposes of determining appropriate accommodations. The Department of Pharmaceutical Sciences will provide reasonable accommodations, but is not required to make modifications that would substantially alter the nature or requirements of the program. A student with questions regarding reasonable accommodation can contact the CDHP office.

### Application Requirements

The application requirements shown in this catalog apply to applicants who are seeking entry for the 2018/2019 academic year. Current admission and application requirements for the Master of Science in Pharmaceutical Sciences program can be located on the [Prospective Student website](#).

Graduates with a Bachelor of Science or Arts degree in pharmacy, chemistry, biology or a related scientific area are eligible for application.

Minimum criteria to receive consideration for admission are as follows. Meeting these criteria, however, does not guarantee admission into the program.

- A completed Western University of Health Sciences Graduate Application form (including all supplemental information for international applicants).
- Official transcripts of all undergraduate and graduate coursework with an overall GPA of 2.50 or greater on a 4-point scale.
- Official test scores for the general aptitude portion (verbal, quantitative, and analytical) of the Graduate Record Examination (GRE) taken within the last five (5) years, with a combined verbal and quantitative score of greater than or equal to 300 is recommended.

- Three letters of reference from individuals who are familiar with the applicant's scholarship and research potential.
- All applicants submitting course work from foreign schools are required to pass English language requirements before they are eligible for financial assistance. A minimum score of 89 on the Internal Based TOEFL (iBT) or 6.5 on the IELTS is recommended. Only iBT scores less than 2 years old from the application deadline will be considered.

### **Application Deadline**

Applications must be received (including all supporting application materials) no later than September 1 for the spring semester and April 1 for the fall semester. A completed application that arrives before the deadline may be considered on a rolling basis.

### **Applicants with Foreign Coursework**

Applicants who wish to use coursework completed outside the United States must submit their transcripts for evaluation to a [Western University of Health Sciences Approved Service](#) at the candidate's expense. A course-by-course evaluation is required and all coursework must be designated as undergraduate, graduate or professional. WesternU only honors evaluations from one of the above services. The official evaluation must be included with the supplemental application packet.

### **International Students**

International students and any other applicants who are not U.S. citizens and who are living in the U.S. should be prepared to provide proof of legal U.S. residency at the time of interview. Proof of legal U.S. residency is required prior to any offer of acceptance. For detailed information, please visit our web page for [International Students](#).

### **Transfer Credit**

A maximum of eight graduate level credits in which the student has earned an "A" from an equivalent program from another accredited U.S. university will be honored towards the Master of Science in Pharmaceutical Sciences for students transferring into WesternU. The Department of Pharmaceutical Sciences must approve all transfer credit, and the decision of the Department is final.

## Registration

All WesternU students are required to register by the registration deadlines specified by the University Registrar. Registration dates are posted on the [Registrar's Office](#) website. Failure to register by the deadline may be grounds for administrative withdrawal. All students registering after the posted deadline will be assessed a \$30.00 per business day late fee.

Full tuition and fees and all prior debts must be paid in full on or by posted deadlines each academic year. Matriculation is subject to the satisfactory completion of all academic requirements and payment of all outstanding debts to the University. The receipt of the final transcript(s) from all colleges/universities attended and a physical examination with documentation of required immunizations (if applicable) prior to registration are additional requirements for incoming students.

### Registration Late Fee Appeals

If you are assessed late fees for a registration period, you may submit an appeal to the Registrar. For additional information on the appeal process, please see the [Registration Late Fees](#) page on the Registrar's Office website.

### Student Health Insurance Requirement

All full-time students at Western University of Health Sciences are required to have active health insurance while enrolled. All students are automatically assessed half of the entire year's insurance premium and will be enrolled in the student health insurance plan until they submit proof of coverage that meets the University's requirements. For additional information on student health insurance requirements and/or waiving out of the student health insurance plan, please see the [Student Health Insurance](#) page on the Registrar's Office website.

### New Student Orientation/Welcome Week

For additional information on Welcome Week activities for the College of Pharmacy, please visit: <http://www.westernu.edu/students/welcome-week/>.

### Continuous Registration

Students entering in the fall of 2015 and after are required to maintain continuous registration until all requirements for the degree have been met, including defense and publication of Thesis. Students not enrolled in coursework during the fall or spring semester (after the completion of their two years) are required to enroll and complete PHSC 6999A, Research and Thesis Continuation

### Student Initiated Changes in Enrollment Status

#### *Course Drop/Withdrawal*

<b>0-20% of Course Completed</b> (Based on Course Start/End Dates)	Course is removed from student's registration and will not appear on student's academic transcript.
<b>20-99% of Course Completed</b> (Based on Course Start/End Dates)	Course is assigned a grade of 'W' to indicate the student withdrew from the course. 'W' grades will appear on the student's academic transcript, but will not be included in the student's GPA calculation.
<b>100% of Course Completed</b> (Based on Course Start/End Dates)	Course is assigned the grade earned.

### ***Leave of Absence***

A student may request a Leave of Absence (LOA) with the occurrence of a medical emergency or illness, personal issues, financial hardship, or military service. Students must be in good academic standing to be eligible for a Leave of Absence. For additional information on the University's Leave of Absence policy, please see 'Student Initiated Changes in Enrollment Status' in the University Catalog, General Academic Policies and Procedures section.

### ***Withdrawal from University/Academic Program***

Matriculation at the University is a privilege granted in consideration of specified levels of performance and of maintaining the established standards of scholarship and personal and professional conduct. The University reserves the right to require withdrawal at any time it deems necessary to safeguard its standards of scholarship, conduct and orderly operation. The student concedes this right by act of matriculation. For additional information on withdrawing from the MSPS program, please see 'Student Initiated Changes in Enrollment Status' in the University Catalog, General Academic Policies and Procedures section.

### **Full-Time/Part-Time Status**

All students enrolled in at least eight units of coursework are considered full-time students in the MSPS program. Students enrolled for 6.00 – 7.99 units of coursework are considered three-quarters-time students in the MSPS program. Students enrolled for 4.00 – 5.99 units of coursework are considered part-time students in the MSPS program.

### **Time Limits**

The Master of Science in Pharmaceutical Sciences program is designed to be completed in two (2) years of full-time study. The requirements for the degree must be fulfilled within three (3) years from the date of matriculation to the program. Students who are unable to meet the 3-year time limit for the MSPS program may be subject to administrative withdrawal. Exceptions must be approved by the program.

## Tuition and Fees

In estimating costs for one academic year of study at Western University of Health Sciences' MSPS program, you should include tuition and fees, books and supplies, room and board, and other miscellaneous expenses. By action of the Board of Trustees, MSPS tuition and fees for the 2017-2018 academic year (subject to change) are as follows:

\$744.00	Per Credit Hour
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### Other Fees and Expenses

\$30.00	Registration Late Fee (Per Business Day)
\$350.00	Graduation Fee
\$470.00	Annual Parking Permit (Auto)
\$25.00	Parking Permit Replacement Fee
\$40.00	Locker Key Replacement Fee
\$10.00	Official Transcript (Each)
\$21.00	Rush Transcript, First Class Mail (Each)
\$25.00	Rush Transcript, Federal Express (Each)
\$10.00	Student ID Replacement Fee
\$TBD	Breakage Fee (Replacement Cost)

### Financial Support

Financial support, which includes a stipend and full payment of tuition, is available to qualified applicants on a limited, competitive basis in the form of teaching and research assistantships. Support is for 12 months (including summers) and is limited to two consecutive years for any student. Students may also receive a travel stipend, which allows for travel to a national meeting.

## General Academic Policies and Procedures

### Attendance and Absences

Attendance is required at all scheduled instructional periods. Absence from instructional periods for any reason does not relieve the student from responsibility for the material covered during the periods missed.

### *Vacation and Emergencies*

Students receive two weeks' vacation each year over the Christmas break. Students may not expect to take more time than this, may not leave early or return late from the break. Summers are the optimal time for focused research effort and as such, no vacation time is allowed for this period. Under special circumstances, a student may arrange a brief 1-3 days off at the discretion of the MSPS Director and their faculty advisor in advance. It is the MSPS Director's and faculty advisor's prerogative whether to grant the time off and is not guaranteed. Students should not enter the program with the expectation of taking time off for other pursuits (i.e., interviews for other programs, leaving the country, hobbies, etc.) Students must submit a time off request at least 3 weeks prior to their time off dates. The form must be approved by MSPS Director, their faculty advisor, any course instructors and the administrative assistant.

Emergencies, including medical problems or serious personal/family issues, which result in less than 15 academic days (three calendar weeks) away from campus, may be granted upon approval by a student's

faculty advisor, in conjunction with the MSPS Director. Any missed course material is the responsibility of the student, and students may be required to complete alternative assignments, at the discretion of course faculty.

Students with emergencies resulting in more than 15 academic days (three calendar weeks) away from campus must apply in writing for a Leave of Absence to the appropriate College Dean or his/her designee. Please see the University Catalog's "Student Initiated Changes in Enrollment Status" for more specific information on a Leave of Absence.

## **Thesis**

The thesis will be based on a research project that the student will undertake in the MSPS program. The faculty advisor will help the student select a topic and mentor the student in his/her progress.

MSPS candidates are required to present a written thesis proposal within 7 months in the program and a written thesis to the thesis advisory committee for approval at the end of their two years. In addition, students will be required to defend their thesis via an oral presentation of the thesis content at the end of the program. The defense committee will consist of the thesis committee and an external member from within the Western University of Health Sciences faculty, whose role will be to ensure that the defense is conducted fairly.

All candidates must pass a comprehensive examination covering the coursework. Successful completion requires the unanimous support of all members of the thesis advisory committee. If a student fails the examination, a re-examination may be accorded to the student based upon the recommendation of the thesis advisory committee and approval of the Director of Graduate Education. Further re-examination may be allowed only under exceptional circumstances and only with the approval of the MSPS Director, Department Chair and Dean of the College of Pharmacy.

Upon satisfactorily passing all examinations, students must submit their thesis to WesternU's library depository CONTENTdm. Submitting to CONTENTdm will make students' theses available on the Internet and to everyone associated with WesternU.

In order to submit a thesis to CONTENTdm, the thesis must be completed and approved by the Thesis Advisory Committee. If published figures are incorporated into a thesis, students need to obtain permission from the published sources and cite the figures appropriately within the figure legends.

Once these steps have been taken, students must turn in the electronic PDF file of the thesis including a thesis signature page signed by all members of the Thesis Advisory Committee, and a signed WesternU Publishing Agreement form to the MSPS administrative assistant, who will send the electronic thesis to CONTENTdm, the Dean, and all members of the Thesis Advisory Committee.

## **Faculty Advisor and Thesis Advisory Committee**

The faculty advisor serves as the chair of the student's thesis advisory committee and helps the student in his/her choice of electives and research projects/thesis topic. Further, the advisor may also assist the student in obtaining a research assistantship if funds are available. The chair is responsible for the satisfactory academic progress of the student, and must hold committee meetings with the student on a regular basis.

Each student will be assigned a faculty advisor prior to admission to the program, and must remain with that advisor for the duration of the degree program. The thesis advisory committee consists of at least three faculty members (the faculty advisor plus two other faculty members). The chair and at least two of the committee members must be full-time faculty in the Department of Pharmaceutical Sciences at the Western University of Health Sciences College of Pharmacy. Upon approval by the Director of Graduate Education, a fourth member from outside of the department may be eligible for appointment to the committee.

### **Issues/Dispute Resolution Procedure**

When an issue or dispute arises between students, the issue/dispute resolution process starts with communication among the involved students. If a satisfactory resolution is not arrived at that level, the matter should then be addressed with the course instructor or the faculty advisor. If the problem is not resolved at the faculty advisor/course instructor level, the matter should be brought to the MSPS Director, followed by the Dean. If the matter has not been resolved at those levels, the final arbiter is the Provost/COO.

When an incident arises involving a faculty member, the first step in the issue/dispute resolution process is discussion with the faculty member. If the matter is not satisfactorily resolved at that level, then the matter should be referred to the MSPS Director, then Dean, in that order. The final arbiter is the Provost/COO.

When an incident arises involving a staff member, the dispute resolution process begins with the MSPS Director, followed by the Dean. The Office of Human Resources is the final arbiter.

Failure to follow this sequence of steps will only serve to delay the appropriate resolution of the issue or dispute as the matter will only be referred back to the correct level in this chain of responsibility.

## **Standards of Academic Integrity, Professionalism and Student Conduct**

The University Standards of Academic Integrity, Professionalism, and Student Conduct, can be located in the University section of the 2017/2018 catalog. Students are expected to be aware of, and abide by, both University and applicable College policies.

## **Standards of Academic Progress**

Only grades in Western University of Health Sciences courses approved for graduate credit will be used in determining the overall grade point average for continuation in the MSPS program. If, at the end of any semester, the cumulative grade point average falls below 3.00, the student will be placed on academic probation, and financial support will be discontinued. A 2.00 ("C") grade earned in any class may be applied toward graduation only if the overall grade point average at the time of application for graduation continues at a minimum 3.00 ("B") cumulative grade point average. Any grade below a 2.00 ("C") may not be applied toward graduation.

### **Graduation**

A student will be recommended for the Master of Science in Pharmaceutical Sciences degree provided he/she:

1. Is not on probation or suspension and has completed all prescribed academic requirements with a cumulative grade point average of above 3.00 and has no outstanding grade of "I", "NCR," or

“U”. A 2.00 (C) grade earned in any class may be applied toward graduation only if the overall grade point average at the time of application for graduation continues at a minimum 3.00 (B) cumulative grade point average.

2. Has satisfactorily completed and orally defended a written thesis.
3. Has successfully passed the Comprehensive Examination on Pharmaceutical Sciences.
4. Has demonstrated no serious deficiencies in ethical, professional or personal conduct, as defined in University Catalog, “General Academic Policies and Procedures” section, which would make it inappropriate to award the degree of Master of Science in Pharmaceutical Sciences.
5. Has complied with all the legal and financial requirements of the University as stated in the University Catalog.
6. Has attended in person and participated in the Commencement ceremony at which time the Master of Science in Pharmaceutical Sciences degree is conferred. Unless special permission has been granted by the Dean, each student must participate in his or her respective commencement ceremony. Requests for excusal will only be granted for extenuating circumstances, such as a prior military commitment.

Students may participate in commencement activities provided they will complete all requirements of the program by December 31 of that calendar year. No student will receive his or her degree until the student has completed all requirements for graduation. Degrees will be dated as appropriate to completion date.

### **Graduate Student Performance Ad-Hoc Committee**

The Graduate Student Performance Ad-Hoc Committee (GSPC) will be formed to: (1) recommend policies and standards for students’ academic performance; (2) review student performance and professional conduct and advise students’ faculty advisors in cases where counseling may be appropriate; and (3) review all cases involving grade appeals and allegations of academic or professional misconduct. All policy recommendations from the GSPC are forwarded to the Department Committee; all recommendations concerning academic or disciplinary action are forwarded to the Dean of the College of Pharmacy.

### **Adverse Actions**

#### ***Probation***

Students may be placed on Probation for the following reasons (these are in addition to the reasons listed in the Satisfactory Academic Progress section of the University Catalog):

1. Inadequate academic progress as determined by the Graduate Student Performance (GSPC) Committee. This includes, but is not limited to, receiving a “U” grade in any course or system.
2. A semester or cumulative grade point average below 3.00.
3. Failure to perform in a professional manner.
4. Serious deficiencies in ethical or personal conduct.

A student on probation for receiving a grade of “U” or for a GPA less than 3.00 in a semester will be removed from probation after one semester provided he/she has regained a cumulative GPA of at least 3.00 and/or has remediated the failed course. Students on probation are to remove themselves from all leadership roles in co-curricular activities associated with the University and/or with professional associations.

### ***Financial Aid Warning Policy (Title IV and Title VII)***

If a student is not making Satisfactory Academic Progress (SAP) they may be placed on “Financial Aid Warning” status for the next payment period and continue to receive financial aid for that period. Financial Aid is any financial assistance offered to the student for paying for their education, such as loans, scholarships, Federal Work-Study, grants and stipends (judged on the criteria of the stipend). Students who fail to make SAP by the end of the payment period lose Financial Aid eligibility.

It is the policy of the Financial Aid Office (FAO) that once a student has been placed on academic probation for not meeting SAP standards as defined by the college, the FAO will automatically place the student in a Financial Aid Warning status. During the next academic term, if the student does not meet SAP standards and the college places the student on academic suspension, the student will no longer be eligible for financial aid. If the student appeals the academic suspension and the appeal is approved, financial aid will be reinstated. If the student is directed to audit courses, those courses will not be covered by financial aid.

### ***Tutorial Assistance Program***

A Tutorial Assistance Program (TAP) has been established to assist students experiencing academic difficulty. Students will be recommended for this program by a faculty advisor or professor. Students may self-identify to TAP to receive assistance. The tutors will be chosen on the recommendation of the faculty in each discipline. Group tutoring is the methodology most used by the TAP department. For assistance, contact the Learning Enhancement and Academic Development Office (LEAD).

### ***Academic Suspension***

Students who are deemed unable to continue in the curriculum due to inadequate performance and are required to repeat a given academic year or portion thereof may be placed on academic suspension through such time as they can resume their studies by starting the courses the student is required to repeat. Throughout the time the student is academically suspended, he or she is also on academic probation, and remains on academic probation until all coursework has been satisfactorily remediated. A student may not receive financial aid during any time of a suspension.

Students on Academic Suspension are not registered as active matriculants and should use this time to remediate for the deficiency for which the Academic Suspension was levied. On campus, students on probation must meet with their faculty advisor at least once a month. It is the student’s responsibility to contact the faculty advisor to arrange these meetings.

### ***Dismissal***

If the cumulative grade point average remains below a 3.00 after the student completes 6 (six) graded credit units subsequent to being placed on academic probation, the student may be dismissed from the program. Students who receive a no-credit grade for PHSC 6999 (Research and Thesis) may be dismissed regardless of GPA or academic standing in the program.

### ***Appeal Process***

MSPS students may appeal decisions regarding suspension, student conduct, academic progression/promotion and graduation according to the regulations listed in the Student Appeal Process section of the University Catalog.

## Evaluation and Grading

### Program Learning Outcomes

1. Demonstrate in-depth knowledge of basic concepts and research in pharmaceutical sciences.
  - MSPS graduates should be able to demonstrate knowledge of the interdisciplinary field of Pharmaceutical Sciences including drug target discovery, design of new drugs, drug delivery, pharmacodynamics and pharmacokinetics.
2. Critically evaluate research methodology and findings of studies within pharmaceutical sciences.
  - MSPS graduates should be able to evaluate evidence through proper interpretation of data and by making logical and appropriate inferences.
3. Apply pharmaceutical science research methodology and advance research within a self-selected area of expertise in his/her own research projects.
  - MSPS graduates should be able to demonstrate research skills specific to their field of study.
4. Communicate pharmaceutical science concepts and research findings through oral and written presentations.
  - MSPS graduates should be able to demonstrate oral and written communication skills, which includes public speaking, generating clear presentations and writing their research thesis and manuscripts.
5. Demonstrate effective teamwork, leadership, and the ability to work as an independent scientist in the conduct of research.
  - MSPS graduates should be able to work within a team as demonstrated through course work and working with their advisor on their thesis project.
6. Conduct research adhering to standards for ethical and responsible research, and reason through ethically challenging situations.
  - MSPS graduates should be able to demonstrate ethical conduct and be able to reason through ethically questionable situations related to their scientific field.

### Grading Scale

Final course grades are given based upon the traditional 4-point letter system, as follows:

<u>Grade</u>	<u>Equivalent</u>	<u>GPA Points</u>
A	Excellent	4.00
B	Good	3.00
C	Satisfactory	2.00
U	Unsatisfactory	0.00
CR	Credit	N/A
NCR	No Credit	N/A

## ADMINISTRATIVE GRADES

<u>Grade</u>	<u>Equivalent</u>	<u>GPA Points</u>
AU	Audit	N/A
I	Incomplete	N/A
W	Withdrawal	N/A
M	Missing	N/A

### **Audit**

An "AU" (Audit) is assigned to a student who pays tuition for the course and attends class activities but does not complete examinations and does not receive course credit. However, under certain circumstances, at the discretion of the College Dean, a student who is repeating or undergoing remediation may be required to complete course examinations and/or other required work products while auditing the course for no grade.

### **Missing Grades**

A grade of 'M' for Missing will be input by the Office of the Registrar if a student's grade is not available by the deadline for grade submission. An 'M' grade is not included in the GPA calculation and will be replaced by the grade earned in the course once submitted by the course director/instructor. 'M' grades should not be used by the program in place of an Incomplete (I) grade.

### **Incomplete**

An Incomplete grade ("I") will only be assigned to students whose professional commitments and/or personal responsibilities prevent him or her from completing the requirements of the course. A student may remove an incomplete by completing course requirements within the following six calendar months or the final grade will be permanently recorded as a "U". This rule applies regardless of the student's enrollment status. A student not enrolled during the following six months must still successfully remove the "I" grade. The instructor must certify any grade changes. The "I" grade will remain on the student's transcript, along with the final grade assigned by the instructor.

### **Grade Reports**

Official grades are turned in to the Registrar from the Departmental Office, at which time the online student records system, BanWeb, is updated. Official grade reports and unofficial transcripts will be available on the BanWeb student records system throughout the academic year.

### **Appealing a Course Grade**

If a student believes there is just cause to dispute a grade for a course, the procedure is as follows: Within five (5) days of receipt of the course grade, the student must make an appointment with the course instructor(s) who issued the grade. Upon written request from the student, the course instructor(s) shall review the case with the student, and a decision shall be made by the course instructor to affirm or modify the grade. Within ten (10) working days of the student's written request, the course instructor shall notify the student in writing of the decision. A copy of the Grade Change Form shall be sent to the student and the Master of Science in Pharmaceutical Sciences Director.

Within five (5) working days following written notification to the student regarding the instructor's decision, the student may appeal the decision in writing to the MSPS Director. The appeal request must

be accompanied by a narrative explaining the basis for the appeal. The narrative should fully explain the student's situation and substantiate the reason(s) for advocating a review of the prior decision of the instructor. The MSPS Director may grant an appeal only if a claim of (1) bias, (2) the appearance of new material and documentable evidence that was not available at the time of the instructor's decision, or (3) procedural error that unfairly affected the decision-making process is substantiated by the Chair. Upon written request from the student with a valid appeal rationale, the MSPS Director shall review the case and within seven (7) working days shall issue a decision in writing to the student, which may affirm, modify or reverse the previous action of the instructor.

The MSPS Director's decision is final in all course grade appeals except when the MSPS Director is the official instructor of the course in question. In such a case, the student will direct his or her appeal to the Dean of the College of Pharmacy, following the same guidelines for an appeal to the MSPS Director. The decision of the Dean in this instance is final.

The student may remain in class pending the outcome of appeals, except in cases of summary suspension or when the Provost, Vice Provost or the Dean of the College Pharmacy has suspended the student or has otherwise determined that it is inappropriate for the student to remain in class.

### **Credit Hour Calculation**

The MSPS program awards one credit hours for every 15 contact hours.

## Curriculum Organization

To graduate, students must complete a minimum of 40 credit hours, including eight credit hours of the two core courses (Advanced Pharmaceutical Sciences I and II), eight credit hours of Graduate Seminar, 1 credit hour of Principles of Biomedical Ethics, 3 credit hours of Electives, and 20 credit hours of Research and Thesis.

### Required Courses

Subject/Course #	Course Title	Credit Hours
PHSC 5101	Advanced Pharmaceutical Sciences I	4.00
PHSC 5102	Advanced Pharmaceutical Sciences II	4.00
PHSC 6000	Graduate Seminar	8.00
PHSC 6001	Principles of Biomedical Ethics	1.00
PHSC 6999	Research and Thesis	20.00
<b>Total Required Credit Hours:</b>		<b>37.00</b>

### Elective Courses

Subject/Course #	Course Title	Credit Hours
PHSC 5111	Leadership in Pharmacy	1.00
PHSC 5112	The Chemistry of Cosmetics	1.00
PHSC 5990	Directed Readings	1.00-4.00
PHSC 6101	Novel Dosage Forms	4.00
PHSC 6102	Advanced Physical Pharmacy	4.00
PHSC 6103	Product Development	4.00
PHSC 6201	Advanced Pharmacokinetics	4.00
PHSC 6202	Computer-Aided Drug Design	4.00
PHSC 6301	Neuropharmacology	4.00
PHSC 6302	Advanced Pharmacology	1.00-4.00
PHSC 6303	Cancer Biology, Therapy, and Prevention	4.00
PHSC 6402	Immunology and Immunotherapies	4.00
PHSC 6701	Advanced Toxicology	1.00-4.00
PHSC 6901	Research Techniques: Theory and Practice	4.00
<b>Total Required Credit Hours:</b>		<b>3.00</b>

### Continuous Registration

Subject/Course #	Course Title	Credit Hours
PHSC 6999A	Research and Thesis Continuation*	0.50

\* Students who do not complete elements of PHSC 6999 Research and Thesis in the final semester in which they are enrolled will continue their work in PHSC 6999A.

## Course Descriptions

All courses are awarded letter grades, except when indicated otherwise.

### **PHSC 5101 Advanced Pharmaceutical Sciences I (4.0 credit hours)**

This course introduces students to a wide range of topics such as immunology, pharmacology, biostatistics and toxicology and some research techniques.

### **PHSC 5102 Advanced Pharmaceutical Sciences II (4.0 credit hours)**

This course introduces students to a wide range of topics such as pharmaceuticals, biopharmaceuticals, biotechnology, pharmacokinetics, drug metabolism and transport, and pharmacogenomics.

### **PHSC 5111 Leadership in Pharmacy (1.0 credit hour)**

This seminar elective introduces students to leadership and management skills related to professional and personal development.

### **PHSC 5112 The Chemistry of Cosmetics (1.0 credit hour. CR/NCR)**

The chemistry of cosmetics elective introduces students to the chemistry of skin and hair care products, sunscreens and perfumes. Furthermore, students will learn about product safety, legislation and cosmetic product evaluation.

### **PHSC 5990 Directed Readings (1.0 – 4.0 credit hours)**

Selected study of topics in the pharmaceutical sciences.

### **PHSC 6000 Graduate Seminar (2.0 credit hours. CR/NCR)**

This course follows a discussion and seminar format where students are required to discuss current literature in the pharmaceutical sciences and present recent advances in the pharmaceutical sciences. The goals of this course are to provide the student with a well-rounded understanding of the current field of pharmaceutical sciences, presentation skills, and the ability to examine, critically, scientific literature. This course is mandatory for all MSPS students in each semester of the program. Repeatable to a maximum of eight credit hours.

### **PHSC 6001 Principles of Biomedical Ethics (1.0 credit hour)**

This course is divided into three portions. The first is a didactic lecture that covers general ethical philosophy that pertains to the biomedical sciences. The course then shifts to case-based small group discussions. First social and medical issues such as treatment of severe communicable diseases and genetic engineering are discussed allowing for application of ethical philosophy to current biomedical debates. Lastly, the course covers the responsible conduct of research and discuss real scientific cases. Once completed students should be able to identify ethical issues and understand the various viewpoints that support solutions to ethical problems and real world consequences of ethical maleficence in the biomedical sciences.

### **PHSC 6101 Novel Dosage Forms (4.0 credit hours)**

Students learn the theoretical basis and design of controlled release and site-specific drug delivery systems such as transdermals, microspheres, liposomes and monoclonal antibodies.

**PHSC 6102 Advanced Physical Pharmacy (4.0 credit hours)**

This course discusses applications of physiochemical principles in the evaluation of pharmaceutical systems, preformulation, and drug transport.

**PHSC 6103 Product Development (4.0 credit hours)**

In this course, students learn formulation, evaluation and manufacturing of pharmaceutical products.

**PHSC 6201 Advanced Pharmacokinetics (4.0 credit hours)**

This course covers pharmacokinetic and pharmacodynamic principles and methods used to study absorption, distribution, metabolism and excretion of drugs.

**PHSC 6202 Computer-Aided Drug Design (4.0 credit hours)**

Contemporary drug design and discovery draws upon many disciplines that requires students to have a broad knowledge of chemistry, physics, molecular biology, pharmacology and computer technology. This advanced elective course allows graduate students in pharmaceutical sciences major to assemble the concepts and strategies on computer-aided drug design and discovery. Examples in structure-based design for a variety of diseases using pharmacophore modeling, QSAR, virtual screening, molecular dynamics and free energy calculations, ADMET property prediction are introduced. While covering the fundamental concepts behind the methods, this course provides a strong focus on the practical aspects of computer-assisted drug design using various software packages, such as MOE, OpenEye, AutoDock, NAMD and VMD. The hands-on training sections are especially valuable to students who wish to use computer-based methods to enhance the productivity of their research or industry R&D fields.

**PHSC 6301 Neuropharmacology (4.0 credit hours)**

In this course students learn topics such as basic principles of action potential, neurotransmission and neurotransmitters/neuromodulators, their receptors and signaling mechanisms as well as their involvement in pathophysiology of CNS disorders. Relevant and recent primary literature articles are introduced for reading and subsequent group discussion.

**PHSC 6302 Advanced Pharmacology (1.0 – 4.0 credit hours)**

This advanced elective addresses concepts and principles of modern pharmacological research. Several faculty may offer this course, or team-teach this course, thus topics and credit hours vary depending on the participating faculty.

**PHSC 6303 Cancer Biology, Therapy and Prevention (4.0 credit hours)**

In this course, students are introduced to cancer biology, therapy and prevention through interactive lectures and discussions. Interest focuses on the molecular, cellular and genetic basis of disease, the principles for cancer therapy and prevention, thus highlighting the challenges in this field of research. This course enables students to understand basic principles of cancer biology and pharmacology and to apply this knowledge to the practice of better drug development.

**PHSC 6402 Immunology and Immunotherapies (4.0 credit hours)**

Students are introduced to basic principles of immunology and how to apply this knowledge to enhance immunotherapy development. This course highlights the importance of immunology in pharmaceutical sciences.

**PHSC 6701 Advanced Toxicology (1.0 – 4.0 credit hours)**

This course focuses on the principles of toxicology and mechanisms of toxicity. Toxicology is the study of poisons. In this course, students discuss examples of major toxic spills and human exposures to illustrate the major adverse health effects associated with environmental toxins.

**PHSC 6901 Research Techniques: Theory and Practice (4.0 credit hours)**

This elective course provides in-depth lectures addressing a wide variety of biochemical, pharmacological, physiological, behavioral, immunological and histo-chemical research methods as well as their application in basic science drug discovery research. The course provides graduate students with the theoretical framework for understanding the most widely used research methods.

**PHSC 6999 Research and Thesis (5.0 credit hours, CR/NCR)**

Students perform supervised research for preparation of their theses. Repeatable to a maximum of 20 credit hours.

**PHSC 6999A Research and Thesis Continuation (0.5 credit hours, CR/NCR)**

Prerequisite: Completion of PHSC 6999 Research and Thesis. Students who do not complete elements of PHSC 6999 Research and Thesis in the final semester in which they are enrolled will continue their work in PHSC 6999A. Students may register for a continuation for a total of two (2) semesters. Should the student require more than two (2) semesters of continuations, the faculty will assess the work to date for reasonable progress. In the event that reasonable progress is not evident by the end of two (2) semesters, the student may be recommended for dismissal for failing to make reasonable progress toward degree completion.

## Honors and Awards

The following award is considered for presentation to MSPS students annually:

Dean' List

## Academic Calendar

<b>Fall 2017</b>	
August 14, 2017	MSPS Orientation, Fall Classes Begin
September 5, 2017	Labor Day – No Classes
October 9, 2017	Columbus Day – No Classes
November 22, 2017	Thanksgiving Recess Begins @ 5:00 p.m.
November 26, 2017	Fall Classes Resume
December 22, 2017	Fall Classes End
December 25, 2017	Winter Recess Begins
<b>Spring 2018</b>	
January 8, 2018	MSPS Orientation, Spring Classes Begin
January 15, 2018	Martin Luther King Day – No Classes
February 20, 2018	President’s Day – No Classes
March 19, 2018	Spring Break Begins
March 26, 2018	Spring Classes Resume
May 25, 2018	Spring Classes End