

M.S. in Pharmaceutical Engineering

Depending on the background of the applicant this bridge program may consist of up to (but generally speaking less, at least for students with engineering degrees) three 3-credit courses specifically designed to provide non-chemical engineers with the necessary prerequisites to enter the program.

A grade point average of at least 3.0 must be achieved in the bridge courses. Students should pay special attention to the successful completion of the bridge courses, since failure to do so may preclude them from enrolling in regular PhEn courses. Students must take the bridge courses before taking any other PhEn courses, with the exception of PhEn (<http://catalog.njit.edu/search/?P=PHEN%20601>) 601 (<http://catalog.njit.edu/search/?P=PHEN%20601>) Principles of Pharmaceutical Engineering and PhEn 604 (<http://catalog.njit.edu/search/?P=PHEN%20604>) Validation and Regulatory Issues in the Pharmaceutical Industry, which can be taken concurrently with the bridge courses. As already mentioned, admission conditions may also include taking additional undergraduate or graduate courses, if needed.

Degree Requirements

The Master of Science in Pharmaceutical Engineering is a 30-credit program. Students have the option of fulfilling 6 credits of a Master's Thesis. The thesis option is primarily, but not exclusively, meant for full-time students. Full-time students receiving support (full or partial) must complete a Master's Thesis. Part-time students working in the pharmaceutical industry are encouraged to pursue a Master's Thesis, possibly conducted at their site and in collaboration with their supervisor.

Students must maintain an overall cumulative grade point average of at least 3.0 throughout their academic career. Students are certified for graduation only if they:

- achieve an OVERALL cumulative grade point average of at least 3.0; and
- achieve a grade point average of at least 3.0 in the required seven CORE COURSES; and
- achieve a grade point average of at least 3.0 in the BRIDGE COURSES.

Students may not repeat a course without approval of both the Program Director and the Office of Graduate Studies, located in the East Building, Suite 140. The grade received in a repeated course will replace the original grade in the calculation of the cumulative grade point average, although the first grade will still appear on the transcript. A MAXIMUM OF TWO COURSES MAY BE REPEATED. Students who receive an F in a course are required to repeat the course.

Program of Study

The program of study includes common core courses and elective courses, and, if the students so chooses, a thesis (in lieu of some elective courses), as specified below. All students must take the same five (5) common core courses as well as 15 credits of elective courses.

Course Requirements

M.S. in Pharmaceutical Engineering, (applicants with science background or engineering degree other than chemical or mechanical, courses only)

Code	Title	Credits
Bridge Courses		
PHEN 500	Pharmaceutical Engineering Fundamentals I ¹	3
PHEN 501	Pharmaceutical Engineering Fundamentals II ¹	3
PHEN 502	Pharmaceutical Engineering Fundamentals III	3
Total Credits		9

¹ PHEN 500 Pharmaceutical Engineering Fundamentals I and PHEN 501 Pharmaceutical Engineering Fundamentals II are offered in the fall and should be taken concurrently.

Code	Title	Credits
Core Courses		
CHE 612	Kinetics of Reactions and Reactor Design	3
CHE 624	Transport Phenomena I	3
PHEN 601	Principles of Pharmaceutical Engineering	3
PHEN 603	Pharmaceutical Unit Operations: Processing of Liquid and Dispersed Phase Systems	3
PHEN 618	Principles of Pharmacokinetics and Drug Delivery	3
Select at least one from these courses		3
CHE 611	Thermodynamics	3

CHE 709	Adv Separation Processes	3
CHE 714	Micromechanics of Part Tech Pr	3
Select at least one from these courses		3
PHEN 602	Pharmaceutical Facility Design	3
PHEN 604	Validation and Regulatory Issues in the Pharmaceutical Industry	3
PHEN 605	Pharmaceutical Packaging Technology	3
Select three elective courses/thesis/project course from the following list		9
Any of the courses already listed above but not yet taken		3
Any courses from the programs specified below:		3
Pharmaceutical Engineering (PhEn) (such as courses not taken already)		
Chemical Engineering (ChE)		
Biomedical Engineering (BME)		
Biology (BIOL)		
Chemistry (CHEM)		
Biopharmaceutical Engineering (PhB)		
Pharmaceutical Materials Processing (PhMP)		
Pharmaceutical Systems Management		
Industrial Engineering (IE)		
Engineering Management (EM)		
Mathematics (MATH)		
Project/Independent Study		3
Thesis		6

M.S. Thesis

Part-time students working in the pharmaceutical industry are eligible and encouraged to pursue the thesis option.

Student Involvement in Research

In addition to taking courses, students have the opportunity to work, one-on-one, with faculty members on research projects in areas of common interest, allowing maximum flexibility for independent work, and providing students with valuable research experience. Students have the option to complete a Master's thesis. PART-TIME STUDENTS WORKING IN THE PHARMACEUTICAL INDUSTRY ARE ENCOURAGED TO PURSUE A MASTER'S THESIS, POSSIBLY CONDUCTED AT THEIR SITE AND IN COLLABORATION WITH THEIR SUPERVISOR.

Qualified and research oriented students have the option of continuing their studies at NJIT by pursuing a Ph.D. in chemical engineering, industrial engineering, chemistry, or related disciplines. The NJIT-Industry Collaborative Ph.D. Program allows greater flexibility to industrial students who are interested in pursuing their Ph.D. while working full-time in industry.