

# Pharmaceutical Manufacturing

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NJIT recognizes the need of pharmaceutical leaders for the latest information on state-of-the-art technologies to support pharmaceutical process development and the operation of manufacturing processes at pharmaceutical companies. The Certificate in Pharmaceutical Manufacturing is designed to educate professionals with backgrounds in engineering or science and provide them with the critical skills required to work in pharmaceutical production and pharmaceutical manufacturing areas.

Who is suited for this program?

This Certificate is intended for students/professionals with a science (e.g., chemistry, pharmacy) or engineering background who intend to learn/expand their technical pharmaceutical manufacturing skills, and apply them to advance in their profession and within their companies.

What will I learn?

- **Pharmaceutical Facility Design:** instruction in design of state-of-the-art pharmaceutical facilities for both manufacturing and R&D, by identifying key functional requirements and design concepts necessary to pharmaceutical processes. Interdisciplinary training will be provided in appropriate areas of facility design.
- **Pharmaceutical Packaging Technology:** developing a working knowledge of the machinery and unit operations used in transferring a drug substance in the bulk final form to a finished product ready for sale to the consuming public.

Electives covering the following areas:

- **Principles of Pharmaceutical Engineering:** basic information about drug discovery and development, FDA requirements and approval processes, drug dosage forms, and the role of key operational units in drug manufacturing processes.
- **Validation and Regulatory Issues in the Pharmaceutical Industry:** development of a working knowledge of the Federal Code of Regulations and its impact on the pharmaceutical and allied industries.
- **Micromechanics of particle technology processing** directly connecting with pharmaceutical unit operations processing solids
- **Specific issues that could be bottlenecks for contemporary pharmaceutical manufacturing**

Why Study Pharmaceutical Manufacturing at NJIT?

The Graduate Certificate in Pharmaceutical Manufacturing has been designed so that students are first provided with an overview of the pharmaceutical industry, including the fundamentals of the drug development cycle, FDA requirements, drug dosage forms, approval processes, and the methodologies used by industry to comply with these regulations. Additional courses then focus on the specifics of validation and regulations affecting the pharmaceutical and allied industries, as well as the more technical aspects of facility design. Examples of these are building and zoning codes; sterile/aseptic processing; clean rooms and controlled environments; HVAC systems; and pharmaceutical water and clean steam systems. This unique combination of detail and overview is very hard to come by across the United States.

Prerequisites

An undergraduate degree with a science or engineering background, with an undergraduate cumulative grade point average (GPA) of at least 2.8 on a 4.0 scale is usually required. Applicants with: (1) a science degree, (2) an engineering degree in a discipline other than chemical or mechanical engineering, or (3) a GPA below 3.0 but at least 2.8, may be conditionally admitted to the program. Conditions may involve completion of a bridge program designed on a case-by-case basis.

Related Degree Programs

All credits for the Pharmaceutical Manufacturing Graduate Certificate can be applied in its entirety to the NJIT MS in Pharmaceutical Engineering (<http://catalog.njit.edu/graduate/newark-college-engineering/chemical-materials-engineering/pharmaceutical-ms/>).

What are the Required Courses?

Code	Title	Credits
<b>Core Courses</b>		<b>6</b>
PHEN 602	Pharmaceutical Facility Design	3
PHEN 605	Pharmaceutical Packaging Technology	3
Electives; select two of the following		6
CHE 714	Micromechanics of Part Tech Pr	3
PHEN 601	Principles of Pharmaceutical Engineering	3

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PHEN 604	Validation and Regulatory Issues in the Pharmaceutical Industry	3
PHEN 725	Independent Study	3