

(036-CMC-01-02) CHEMICAL ENGINEERING (PHARMACEUTICAL)

Significance of the Program

In this program, chemical engineers play a pivotal role in integrating core chemical engineering principles with the specific needs of the pharmaceutical industry. This program uniquely equips graduates with the expertise to design, optimize, and oversee processes critical to drug development and manufacturing. The emphasis on regulatory compliance ensures a deep understanding of the stringent standards governing pharmaceuticals and also ensuring the safety, efficacy, and quality of pharmaceutical products. With a focus on innovation and research, graduates are poised to contribute to advancements in drug formulations and production techniques.

Career Options

Chemical engineers specializing in pharmaceutical engineering have diverse career options.

- They can work as process engineers, optimizing manufacturing operations and ensuring the efficiency of drug production.
- Quality control specialists focus on maintaining stringent standards, adhering to regulatory requirements, and ensuring the safety of pharmaceutical products.
- Research and development roles involve innovation in drug formulations, improving existing processes, and contributing to the creation of new pharmaceuticals.
- Production managers oversee the entire manufacturing process, ensuring smooth operations and compliance with quality standards.

Program Objectives

- The curriculum is designed to provide students with a strong foundation in core chemical engineering principles, coupled with specialized knowledge in pharmaceutical processes.
- The objectives include imparting an in-depth understanding of drug formulation, manufacturing, and packaging, as well as the ability to optimize these processes for efficiency and scalability.
- Regulatory compliance and quality control are emphasized, ensuring that graduates are well-versed in adhering to global standards and regulations governing pharmaceutical production.

- The program also aims to cultivate research and development skills, encouraging innovation in drug formulations and processes.
- Interdisciplinary collaboration, effective communication, and ethical considerations are integral aspects of the program, preparing students not only with technical expertise but also with the professional and ethical mindset required in the pharmaceutical engineering field.

Outcomes of the Program

- The program outcomes for Chemical Engineering with a Pharmaceutical Engineering specialization are designed to produce graduates who possess a profound understanding of pharmaceutical engineering concepts.
- Graduates will demonstrate mastery in drug formulation, manufacturing processes, and quality control, enabling them to contribute effectively to the pharmaceutical industry.
- Emphasize regulatory compliance, instilling in them the knowledge and skills needed to navigate the complex landscape of pharmaceutical regulations, including adherence to Good Manufacturing Practices (GMP).
- The program aims to cultivate innovative problem-solving skills, empowering graduates to address challenges in drug development and manufacturing.
- Graduates will excel in communication and interdisciplinary collaboration, facilitating seamless integration into teams working across diverse fields.

Major Course Outline

1. Separation Processes
2. Reaction Engineering
3. Process and quality control
4. Process safety