

Pharmaceutical Process Design

1. **Course number and name:** 020CPPCS3 Pharmaceutical Process Design
2. **Credits and contact hours:** 4 ECTS credits, 2x1:15 contact hours
3. **Name of instructor:** Marina Daccache
4. **Instructional materials:**
 - PowerPoint slides
5. **Specific course information**
 - a. **Catalog description:**

This course focuses on synthesis, separation, and sterile processing in the field of pharmaceutical processes. It enables students to explore the fundamental principles of drug synthesis and key operations used in pharmaceutical manufacturing. By understanding the lifecycle of pharmaceutical products, students will develop essential skills to design and optimize pharmaceutical processes while considering specifications, testing, and quality standards.
 - b. **Prerequisites:** None
 - c. **Required/ Selected Elective/Open Elective:** Selected Elective
6. **Educational objectives for the course**
 - a. **Specific outcomes of instruction:**
 - Gain a comprehensive understanding of the fundamental principles of synthesis, separation, and sterile processing in the context of pharmaceutical processes.
 - Apply these principles effectively to design and optimize pharmaceutical processes.
 - Develop a knowledge of industrial examples of pharmaceutical synthesis and essential operations used in pharmaceutical manufacturing.
 - Understand the lifecycle of pharmaceutical products, including variability, testing, and specifications of pharmaceutical ingredients.
 - Acquire knowledge of unit operations and separation techniques including mixing, granulation, fluidized bed operations, grinding, capsule filling, tablet compaction, and tablet coating.
 - b. **PIs addressed by the course:**

PI	2.2	2.3
Covered	x	x
Assessed	x	x

7. **Brief list of topics to be covered**
 - Introduction to the Pharmaceutical Industry

- Drug composition and Bioavailability
- Key ingredients and their preparations
- Sterility in the pharmaceutical industry
- Drug synthesis and lifecycle
- Preformulation and design
- Methods and processes for formulation optimization
- Industrial mixing processes
- Tablet production
- Capsule and gelatin production
- Scale-up in the pharmaceutical industry and case study
- Case study of industrial production.