**Why is this Module important?**

In taking a product from the laboratory to manufacture it is essential not only to gain practical experience but also to have a thorough grounding in the methodology and technologies that underpin process development. This module provides the understanding in a thoroughly practical industrial environment, using lecturers with industrial experience.

**Who is this Module suitable for?**

Students from the pharmaceutical industry who are engaged in R&D on products which will be scaled up, as well as those engaged in process development and manufacture. Students from related industries such as fine and speciality chemicals, agrochemicals and food will also benefit as many of the concepts are also applicable in these industries. An undergraduate level of competence in fluid mechanics, heat transfer, chemistry and reaction engineering are required.

**How will students benefit?**

This module will equip students with necessary knowledge for a technical position in the pharmaceutical industry. A particular feature of this module is that lecturers are carefully selected for their expertise in their specific field and their first-hand interactions with industry. Particular emphasis is paid to practical know-how, and most topics are taught by staff with relevant industrial experience. The case studies at the conclusion of the course are taken from professional practice of the lecturer and are discussed in the form of an interactive workshop, where students propose their own solutions to a specific scenario before the historical approach is reviewed.

**What does this Module cover?**

The module consists of the following topics:

- **Process Development Methodology**: Workflow, regulatory context, Good Manufacturing Practice (GMP), roles and responsibilities of the process development team, metrics
- **Product Form and Effect**: API manufacture (crystallization, filtration, drying); dosage form manufacture (granulation, tableting, coating)
- **Mixing**: Common reactor types, impellers and baffles, flow regimes, power draw, lab and plant equipment
- **Separations and Process Analytics**: Chromatography, Process Analytical Technologies and Quality by Design
- **Route and Reactions**: Kinetics of organo-catalytic reactions, asymmetric catalysis, reaction progress kinetic analysis
- **Scale-Up**: Process safety, similarity concept, scale-up rules, scale-up of multiphase systems
- **Case Studies**: Safe scale-up, reactor & crystalliser assessment, multi-phase process scale-up

**What will the student learn?**

On completion of the module students will have a thorough understanding of the methodology of process development in the pharmaceutical industry, the relevance of product form and strong background in unit operations and the principles of scale-up.

For more information about the Modular Masters or to apply please email HEOperations@cogentskills.com or call 01925 515 200. www.cogentskills.com