

## **MASTER of SCIENCE IN PARTICLE TECHNOLOGY (MEPT)**

Approved unanimously by Faculty Senate on February 3, 2014, the Master of Engineering in Particle Technology from the Department of Chemical and Biomolecular Engineering addresses the unique challenges inherent in particulate materials and particle processes rarely addressed in undergraduate engineering programs. While elements of particle processing may be introduced in some chemical, mechanical or materials engineering curricula, no program provides a comprehensive background in the properties of granular systems or the design and analysis of particle products and processes. The MEPT program fills this gap by providing a rigorous, fundamental and industry-sector-agnostic education in the behavior of particulate systems and the analysis and design of particulate processes and products. The program is intended for engineers, either newly graduated or with industrial experience, who want to develop their expertise in particle technology for industrial application. The program builds on an undergraduate-level background in engineering, including mathematics, chemical thermodynamics, physical chemistry and transport phenomena.

### **Admission Requirements**

- Applicants must hold a bachelor's degree from an accredited four-year college or university with a minimum undergraduate grade-point average in engineering, science and mathematics courses of 3.0 on a 4.0 scale.
- This degree may be in chemical engineering, mechanical engineering, civil engineering, environmental engineering, chemistry, materials science or physics disciplines, if the undergraduate program includes engineering thermodynamics, calculus, differential equations, linear algebra, and transport phenomena (fluid mechanics, heat and mass transport).
- Individuals holding non-U.S. degrees may request a review for determination as to equivalency of a four-year U.S. degree. The accreditation of the institution which granted the degree, courses taken, grades and work history in the field of the earned degree are all taken into account when making an equivalency decision.
- Candidates may take up to 9 credit hours of coursework as an Engineering Outreach Non-Degree (EGORND) student while studying for the GRE exam and/or making a final decision to apply for MEPT.
- Applicants must submit a UD graduate application including:
  - a resume and unofficial transcript(s) for undergraduate work (and graduate work, if applicable).
  - a minimum of three letters and recommendations of strong support from faculty or supervisors.
  - a statement of purpose or personal essay sharing relevant information outlining how he/she is a good match for the MEPT program (i.e. educational plans, career goals and how the MEPT graduate program relates to them).
  - GRE scores: a minimum score of 155 (700) on the quantitative portion of the GRE. Candidates with substantive industrial experience, those holding terminal degrees

- (MD, JD, PhD, EdD), those with clear proficiency in undergraduate course performance, or those submitting LSAT or MCAT scores may request a waiver.
- International applicants should have a minimum score of 600 on TOEFL, 250 for CTOEFL, 100 for TOEFL iBT, or 7.5 on IELTS, unless proof is submitted of having earned a degree from an institution in a country where English is the primary language. International applicants may apply for a Conditional Admission Program (CAP) which allows an applicant to complete the University of Delaware English Language Institute's program instead of taking the TOEFL or IELTS test.
  - Admission to the graduate program is competitive:
    - MEPT has a rolling admission.
    - Applicants who meet the minimum requirements are not guaranteed admission.
    - The Department has limited space for new students and may not be able to admit all qualified applicants.
    - No one element of the application will exclude or ensure admission
    - Application deadline for fall admission is September 1<sup>st</sup>.

## **Degree Requirements**

The Master of Science in Particle Technology (MEPT) program may be pursued by full-time or part-time students on campus or via distance learning (UD web conferencing technology). The MEPT program requires 30 credit hours of graduate level coursework: 18 credits of core courses that cover the key concepts of particle technology, 6 credits of relevant approved electives, and 6 credits of the capstone industrial internship course. Coursework must be completed with a grade point average of 3.0 or higher (see Graduate Catalog for relevant details). The course requirements are designed both to provide a comprehensive education in particulate systems, the analysis and design of particle products and processes, a balanced degree of specialization, and fundamental engineering science application in industrial practice. Students are able to complete all degree requirements in 12 months of full-time study; part-time students are able to complete the degree requirements within 2 years (or more, if desired).

- A. The following four courses are required (12 credits) and taught in fall semester:\*

  - a. CHEG 670 – Particle Rate Processes
  - b. CHEG 671 – Particle Transport
  - c. CHEG 672 – Mathematics of Particle Systems
  - d. CHEG 673 – Particle Properties & Characterization

- B. The following two courses are required (6 credits) and taught in spring semester:\*

  - a. CHEG 674 – Particle Processing Operations
  - b. CHEG 675 – Particle Product Engineering

- C. The capstone industrial internship (6 credits) is required and taught in summer semester:\*

  - a. CHEG 684 – Particle Technology Internship

- D. 2 additional courses (6 credits) are required as relevant approved electives:
  - a. Students may choose from pre-approved electives:
    - i. CHEG 600 – Intro to Science & Engineering of Polymer Systems
    - ii. CHEG 604 – Probability & Statistics for Engineering

- iii. CHEG 615 – Special Topics in Mixing
  - iv. CHEG 616 – Chemistry & Physics of Surfaces & Interfaces
  - v. CHEG 617 – Colloid Science & Engineering
  - vi. CHEM 685 – Colloid Chemistry
  - vii. CIEG 670 – Physics of Cohesive Sediment
  - viii. CIEG 679 – Sediment Transport Mechanics
  - ix. MEEG 613 – Nanomaterials & Nanotechnology
  - x. MEEG 615 – Mechanical Properties of Materials
  - xi. PHYS 624 – Intro to Condensed Matter Physics
- b. Students may seek approval to take/transfer another relevant elective from UD or external institution

\*Students may seek approval from the MEPT Directors to take core or elective courses in a different sequence or semester than the standard course offering.

## **Funding**

The MEPT program does not offer funding (fellowship or teaching assistantship), however, a reduced graduate tuition has been approved for MEPT students. In addition, the capstone industrial internship requires an industry sponsor and it is expected that MEPT students will interview, be hired and paid by the industry collaborator.