Pharmaceutics Graduate Learning Goals and Outcomes

Mission
The mission of the Graduate Program in Pharmaceutics is to prepare students to conduct research in the area of the drug formulation, drug delivery, and pharmacokinetics/pharmacodynamics.

Program Overview
The Pharmaceutics (Phmc) graduate program has 11 faculty and 26 graduate students. The department offers the M.S. degree with the thesis option (Plan A) and a research-based Ph.D. degree. The goals of the graduate program are to train Master students to achieve success in a career in industry and PhD students to achieve success in a research-based career in academia, industry or government. Because of the faculty commitment to research, there is an emphasis on graduate work at the PhD level. Students are prepared for research in the development and testing of drug products, including investigating interactions of drugs with complex biological systems and the physical and chemical formulation of drugs for delivery. Although there are no national rankings for graduate programs in pharmaceutics, we are housed in the College of Pharmacy that ranks third in the country.

Process by which goals and outcomes were identified
The Director of Graduate Studies (DGS) prepared a draft of this document and solicited comments and suggestions from faculty, students and administration. Comments and suggestions were incorporated into a second draft that was again distributed. This led to the final draft, which will be voted on at an upcoming faculty meeting. Going forward, the discussion will be broadened to include alumni and the College of Pharmacy Advisory Board.

Pharmaceutics Graduate Learning Outcomes
The learning outcomes for our program are: (1) knowledge and scholarship; (2) intellectual curiosity; (3) communication skills; and (4) ability to work in a group/team. Success at these outcomes leads to the measurable goals of research productivity and jobs. Knowledge and scholarship were identified as the most important outcomes, as they relate directly to graduate level coursework and research productivity. Intellectual curiosity is fundamental to our graduates’ ability to work and think independently. Communication skills, developed through annual seminars presented to the Department and research presentations at national and international meetings, are also critical to job performance in essentially all settings. Teamwork is fostered within research groups, further training students for the outside world. Faculty and students agree that these outcomes are relevant for students pursuing either an M.S. or Ph.D. degree and for students who find either academic or nonacademic jobs.

Pharmaceutics Assessment Processes
The learning outcomes are associated with research productivity, which is primarily assessed through publications in journals and presentations at national and international meetings. The Department also has a series of courses and examinations that are used to track progress of student preparation. All students are offered four core courses in the first year of the program in the areas of (1) Physical pharmacy, (2) Pharmacokinetics, (3) Statistics/hypothesis testing, and (4) Drug delivery. These courses must be successfully completed and may be repeated once to demonstrate competence. Students seeking a PhD must pass a Preliminary Written Exam, which
requires writing a research proposal. Following the PWE, students must then pass a Preliminary Oral Examination (POE). This exam consists of a presentation on the student’s research proposal followed by questions focused both on that research and on general topics in pharmaceutics germane to the research proposal. There are final oral defenses for both M.S. and Ph.D. degrees.

Pharmaceutics also tracks and assesses student progress through an annual self-evaluation process. This process reflects the belief that the primary assessment of graduate student learning outcomes occurs between student and adviser, with input from their M.S and/or Ph.D. committee. Each graduate student is asked to evaluate his/her progress and to list any major milestones from the previous year and goals for the next year. The student then shares this document with his/her research adviser, who adds his/her evaluation. The student and their adviser then meet to discuss the evaluation and sign off on the document. This formal review helps identify problems between faculty and students and alerts the DGS of students, who are not making adequate progress towards their degree.

Summary
Graduate learning outcomes are individualized and personal. Students come to graduate school for many different reasons, and thus the student must be guided to set a learning path, in both coursework and research, consistent with their career goals. The graduate education model of highly individualized instruction and interaction is well suited to accomplish this goal. While departmental assessment processes are used to monitor student progress, the primary responsibility largely rests on individual students and faculty advisors/committees.