What is ‘pharmaceutics’?

‘Welcome to ‘Ceutics’!’

One of the earliest impressions that many new pharmacy and pharmaceutical science students have of their chosen subject is the large number of long and sometimes unusual-sounding names that are used to describe the various subject areas within pharmacy and the pharmaceutical sciences. The aim of this section is to explain to the reader what is meant by just one of them – *‘pharmaceutics’*. This note describes how the term has been interpreted for the purpose of this book and how pharmaceutics fits into the overall scheme of pharmaceutical science and the process of designing and manufacturing a new medicine. This note also leads the reader through the organization of this book and explains the reasons why an understanding of the material contained in its chapters is important in the design of modern drug delivery systems.

The word ‘pharmaceutics’ is used in pharmacy and the pharmaceutical sciences to encompass a wide range of subject areas that are all associated with the steps to which a drug is subjected towards the end of its development. It encompasses the stages that follow on from the discovery or synthesis of the drug, its isolation and purification, and testing for advantageous pharmacological effects and absence of serious toxicological problems. Put at its simplest – *pharmaceutics converts a drug into a medicine.*

Just a comment here about the word ‘drug’. This is the pharmacologically active ingredient in a medicine. ‘Drug’ is the correct word, but because the word has been somewhat hijacked as the common term for a substance of misuse, alternatives are frequently used, such as ‘medicinal agent’, ‘pharmacological agent’, ‘active principle’, ‘active ingredient’, or increasingly ‘active pharmaceutical ingredient (API)’, etc. The book uses the simpler and still correct word, ‘drug’. Phrases like ‘active ingredient’ can suggest that the other ingredients of a medicine have no function at all. This book will teach you loud and clear that this is not the case.

Pharmaceutics, and therefore this book, is concerned with the scientific and technological aspects of the design and manufacture of dosage forms. Arguably, it is the most diverse of all the subject areas in the pharmaceutical sciences and it encompasses:

- an understanding of the basic physical chemistry necessary for the effective design of dosage forms (physical pharmaceutics)
- an understanding of relevant body systems and how drugs arrive there following administration (biopharmaceutics)
- the design and formulation of medicines (dosage form design)
- the manufacture of these medicines on a small (compounding), intermediate (pilot-scale) and large (pharmaceutical technology, manufacturing) scale
- the avoidance and elimination of microorganisms in medicines (pharmaceutical microbiology, sterilization), and
- product performance testing (dissolution testing, drug release, stability testing).

Medicines are drug-delivery systems. That is, they are a means of administering drugs to the body in a safe, efficient, accurate, reproducible and convenient manner. The book discusses the overall