[A-3]COURSE SYLLABUS

1. Course Description (Approximately 100 words)

Pharmaceutical Biotechnology is intended to provide the student with a working knowledge of the preparation, stability and formulation of different protein and peptide drugs such as antisense agents, transgenic therapeutics and gene therapy. Current FDA approved biotechnology drugs such as human insulin, growth hormones and interferons will be discussed

2. Course Goals and Objectives (Approximately 100 words)

Upon completion of this course, the students shall be able to:
1 evaluate different pharmaceutical parameters of current biotechnology products.
2. determine parameters related to stability and formulation of biotechnology products
3. discuss quality control procedures related to biotechnology products.
4. discuss novel formulation methods for better delivery of biotechnology derived drugs
5. discuss the delivery of biotechnology products by the parenteral, oral, transdermal and nasal routes of administration
6. evaluate different techniques related to separation and purification of cell types; conduct techniques for measuring cell turnover and growth, conduct cytotoxicity assays.

3. Textbook (Title, Author, Publisher, Year of Publication, etc.)

1) Pharmaceutical Biotechnology: An introduction for pharmacists and pharmaceutical scientists, Eds Danan J.A. Crommelin and Robert D. Sindelar, Harwood Academic Publishers, 1997
2) Biotechnology and Pharmacy, eds. John M. Pezzuto, Michael E. Johnson and Henri R. Manasse, Chapman and Hall, 1993

3) Pharmaceutical Biotechnology: Fundamentals and Essentials, Melvin E. Klegerman and Michael J. Groves, Interpharm Press Inc, 1992

4. Reference

Protein and Peptide Delivery, Marcel Decker, Vincent Lee, 1997

Molecular antibody technology, Ailsa Campbell, 1984

5. Course Requirements and Grades

EXAMINATION = 70%
ASSIGNMENTS = 10%
C.A.T. = 20%

TOTAL = 100%

6. Course Calendar

Week	Main Content
1	Development of drugs and pharmaceutical industries
2	Early progress in drug development
3	Pharmacokinetics
4	Drug metabolism
5	Bulk drug Manufactures
6	Pharmaceutical manufacturing of dosage forms
7	C.A.T.
8	Tablets
9	Coating of tablets
10	Injections, gels and patches
11	Preservation of drugs
12	Therapeutic vitamins towards human system
13	STRONG ANALGESICS
14	EXAMINATION