PHARMACEUTICAL BIOTECHNOLOGY AND HEALTH CARE

STRUCTURE

STUDY PROGRAMME	Master_BE
Study year	I
Semester	2
Study subject regime	DOS
Total number of hours per week	Course - 2 ore; L/S/P - 2 ore
Total number of hours according to the curriculum	Course - 28 ore; L/S/P - 28 ore
Number of credits	9

STUDY SUBJECT OBJECTIVES

- Study of particularities of application of biotechnological principles and procedures for obtaining, industrialy, major products, drug substances and intermediates.
- Practical exemplification in laboratory experiments of representative stages of biotechnological processes applied to obtain certain substances of interest.
- Teaching the students how to develop biotechnological processes in laboratory and pilot level for obtaining biologically active compounds with pharmaceutical use in drug industry.

CONTENTS

COURSE	Remarks on the hours
Introduction. Oobjectives of discipline and overview of the main chapters of the course. The evolution of biotechnology and its impact on production and use of biologically active molecules.	2
Chapter I - Relations between chemical structure and biological activity of biologically active substances.	2
Chapter II - Characteristic elements of microbial biosynthesis technologies.	2
Chapter III - Therapeutic microbial enzymes. Obtaining processes.	4
Chapter IV - Obtaining of antibiotics by biosynthesis technologies.	6
Chapter V - Obtaining of vitamins by biosynthesis technologies.	2
Chapter VI - Intermediaries of pharmaceutical interest produced by biotechnological processes.	4
Chapter VII - Obtaining of vitamins by biosynthesis technologies.	4
Chapter VIII - Biodegradable polymers used in transport of therapeutical peptides and proteins.	2
LABORATORY	**Remarks on the hours**
1. Rules for work safety in biotechnology laboratories and pilot plants for biotechnological processes.	2
2. Preservation of the microorganisms of interest to the pharmaceutical industry.	2
3. Preparation of culture media according to nutritional and biosynthetically needs and of the strain.	4
4. Biosynthesis of asparaginase.	2
5. Post-biosynthesis processing of fermentation media. Separation of bacterial biomass with asparaginase activity. Extraction of L-asparaginase from *E. coli* biomass.	4
6. Asparaginase assay.	4
7. Partial purification of L-asparaginase with bentonite.	2
8. Purification of L-asparaginase by ammonium sulphate fractionation.	4
9. Isolation of L-asparaginase by precipitation with organic solvents.	2
10. Evaluation-test.	2

BIBLIOGRAPHY

1. M. Syed, K. Ahmadrehana, P N Kharu, *A Book of Biotechnology*, University Book House, 2010.
2. M.I. Page, *Chemistry of Beta-Lactams*, Springer, 1992.
3. William G. Flynne, Biotechnology and Bioengineering, Nova Publishers, 2008.
4. J.G. Chirikjian, Biotechnology: *Plant biotechnology, animal cell culture, immunobiotechnology*, Jones & Bartlett Publishers, 1995.

EVALUATION

Activity type	Evaluation criteria	Evaluation methods	Share in the final grade (%)
Course	Individual performance (level of mastery of theoretical knowledge).	Multiple choice exam	80
L/P/S	Individual performance: level of mastery of theoretical and practical knowledge.	Multiple choice test	20

Course titular's signature: Şef lucrări dr. Gropoşilă-Constantinescu Diana

Laboratory titular's signature L/S/P: Şef lucrări dr. Gropoşilă-Constantinescu Diana