ECTS CREDIT TEACHING SYSTEM

SUBJECT	Exam / Semester	Total	Lectures	Practice	1st year		2nd year		3rd year		4th year		5th year	Credits
			Semester		I	II	III	IV	V	VI	VII	VIII	IX	
1.Mathematics	I	**60**	30	30	2/2	-	-	-	-	-	-	-	-	**4**
2.Biology	I	**60**	30	30	2/2	-	-	-	-	-	-	-	-	**4**
3.History of pharmacy	I	**30**	30	0	2/0	-	-	-	-	-	-	-	-	**2**
4.General and inorganic chemistry	II	**120**	45	75	2/3	1/2	-	-	-	-	-	-	-	**8**
5.Physics and biophysics	II	**90**	30	60	1/2	1/2	-	-	-	-	-	-	-	**6**
6. Latin language	II*	**60**	0	60	0/2	0/2	-	-	-	-	-	-	-	**4**
7. Foreign language	II*	**120**	0	120	0/4	0/4	-	-	-	-	-	-	-	**8**
8. Sports	IV*	**120**	0	120	0/2	0/2	0/2	0/2	-	-	-	-	-	**8**
9. Applied mathematics	II	**45**	15	30	-	1/2	-	-	-	-	-	-	-	**3**
10. Human anatomy	II	**45**	30	15	-	2/1	-	-	-	-	-	-	-	**3**
11. Human physiology	III	**90**	60	30	-	2/0	2/2	-	-	-	-	-	-	**6**
12. Pathoanatomy	III	**30**	15	15	-	-	1/1							**2**
13. Computer technologies	III*	**30**	0	30	-	-	0/2	-	-	-	-	-	-	**2**
14. Pathophysiology	IV	**60**	30	30	-	-	-	2/2	-	-	-	-	-	**4**
15. Analytical chemistry	IV	**180**	60	120	-	-	2/4	2/4	-	-	-	-	-	**12**
16. Organic chemistry	IV	**180**	60	120	-	-	2/4	2/4	-	-	-	-	-	**12**
17. Microbiology with virusology	IV	**120**	60	60	-	-	2/2	2/2	-	-	-	-	-	**8**
18. Physical chemistry with colloid chemistry	V	**90**	45	45	-	-	-	2/2	1/1	-	-	-	-	**6**
19. Pharmaceutical botany	V	**120**	60	60	-	-	-	2/2	2/2	-	-	-	-	**8**
20. Medical devices	V*	**30**	0	30	-	-	-	-	0/2	-	-	-	-	**2**
21. Biochemistry	V	**90**	45	45	-	-	-	-	3/3	-	-	-	-	**6**
22. Pharmaceutical chemistry	VI	**225**	90	135	-	-	-	-	3/2/2	3/2/3	-	-	-	**15**
23. Pharmaceutical technology – part 1	VI	**210**	60	150	-	-	-	-	2/5	2/5	-	-	-	**14**
24. Clinical chemistry	VI	**60**	15	45	-	-	-	-	-	1/3	-	-	-	**4**
25. Pharmacognosy – part 1	VII	**210**	60	150	-	-	-	-	-	2/5	2/5	-	-	**14**
26. Pharmacology	VII	**180**	60	120	-	-	-	-	-	2/4	2/4	-	-	**12**
27. Social pharmacy and pharmaceutical legislation	VII	**150**	60	90	-	-	-	-	-	2/3	2/3	-	-	**10**
28. Hygiene and ecology	VII	**45**	30	15	-	-	-	-	-	-	2/1	-	-	**3**
29. Pharmaceutical technology – part 2	VIII	**225**	60	165	-	-	-	-	-	-	2/5	2/6	-	**15**
30. Pharmaceutical analysis	VIII	**225**	60	165	-	-	-	-	-	-	2/5	2/6	-	**15**
31. Pharmacoeconomy	VIII	**75**	30	45	-	-	-	-	-	-	-	2/3	-	**5**
32. Toxicology	VIII	**90**	30	60	-	-	-	-	-	-	-	2/4	-	**6**
33. Medical genetics	VIII	**30**	15	15	-	-	-	-	-	-	-	1/1	-	**2**
34. Pharmacotherapy	IX	**150**	60	90	-	-	-	-	-	-	-	2/3	2/3	**10**
35. Biopharmacy and pharmacokinetics	IX	**120**	30	90	-	-	-	-	-	-	-	-	2/6	**8**
36. Bromatology	IX	**60**	30	30	-	-	-	-	-	-	-	-	2/2	**4**
37 Pharmacognosy – part 2	IX	**90**	30	60	-	-	-	-	-	-	-	-	2/4	**6**
38. Pharmaceutical care	IX	**75**	30	45	-	-	-	-	-	-	-	-	2/3	**5**
39. Optional course	IX	**60**	30	30	-	-	-	-	-	-	-	-	2/2	**4**
Total		**4050**	**1425**	**2625**										**270**

*** - Continuous assessment**

MATHEMATICS

ECTS CREDITS: 4

HORARIUM: Lectures	Hours per week - 2	Weeks – 15
practicals	Hours per week - 2	Weeks - 15

SEMESTER: I

CONTENTS: Elements of linear algebra and analytical geometry, elements of the theory of numerical series and numerical functions of one or two variables, elements of differential and integral calculus, elements of the theory of ordinary differential equations.

OBJECTS: Gaining of knowledge of the basic fields of higher mathematics necessary for the understanding of the quantitative methods and models in physical chemistry, biochemistry and pharmacology, and of capability of unaided solution of some of the often encountered problems in pharmaceutical research.

ASSESSMENT: Examination in two stages - practical and theoretical parts.

BIOLOGY

ECTS CREDITS: 4

HORARIUM: Lectures	Hours per week - 2	Weeks - 15
Practicals	Hours per week - 2	Weeks - 15

SEMESTER: I

CONTENTS: The following basic units are covered: material basis of life, organization of the living systems, heredity and variety, the organism as a unified system – immunological homeostasis, sexual reproduction and individual development, biological evolution and population genetics, anthropogenesis, ecology, poisonous plants and animals with medical significance.

OBJECTIVES: Obtaining knowledge on the basic principles of organization and function of the living systems, the cellular and molecular bases of life, the human as a product of the biological and social evolution, ecology and the role of humans in the biosphere.

ASSESSMENT: Continuous assessment during the practical, colloquium and theoretical examination in the end of the semester, including work in written.

HISTORY OF PHARMACY

ECTS CREDITS: 2

HORARIUM: Lectures Hours per week - 2 Weeks - 15

SEMESTER: I

CONTENTS: Development of the pharmaceutical knowledge and practice based on society and cultural history of nations. The development of Bulgarian pharmacy is considered in the context of world pharmacy.

OBJECTS: To provoke respect of the pharmaceutical profession by the presentation of the contribution of various countries to the development of world pharmacy as well as to elucidate the activities of famous old schools.

ASSESSMENT: examination in the end of the semester.

GENERAL AND INORGANIC CHEMISTRY

ECTS CREDITS: 8

HORARIUM:	Lectures	Hours per week – 2/1	Weeks - 30
	Practicals	Hours per week 3/2	Weeks - 30

SEMESTER: I and II

CONTENTS: The most important problems of the general theory as well as the systematic material of inorganic chemistry are included in the lecturing course. Particular attention is given to the macro- and microbiogenic elements and their substances which are of decisive importance for the existence and functioning of biosystems. The laboratory exercises are preceded by a course of stoichiometric calculations. The practical training includes the solution of theoretical problems.

OBJECTS: Training in the basic manipulations in a chemical laboratory. Creation of a basis for the future education in all other chemical subjects.

ASSESSMENT: Practical examination, written examination, oral examination.

PHYSICS AND BIOPHYSICS

ECTS CREDITS: 6

HORARIUM: Lectures	Hours per week - 1	Weeks - 30
Practicals	Hours per week - 2	Weeks - 30

SEMESTER: I and II

CONTENTS: Structure and properties of liquids and solids. Optics - basics of refractometry, dioptrometry, photocolorimetry, spectrophotometry, nephelometry, polarimetry, microscopy. Spectroscopy - atomic, molecular, X-ray, mass, NMR, EPR, Moessbauer. Ionization radiations - X-rays, radioactivity, dosimetry.

Rheology of simple liquids and heterogeneous systems, haemorheology. Thermodynamics and Biothermodynamics. Biological and man-made membranes - functions, types, chemical composition, structure. Free-radical lipid peroxidation in biomembranes. Transport of substances through porous and semipermeable membranes, facilitated diffusion, active transport. Electrical properties of cells and tissues - biopotentials: static and dynamic, surface electrical charge, electrical conductivity.

OBJECTS: Knowledge necessary for the study of Analytical Chemistry, Physical Chemistry, Organic Chemistry, Pharmaceutical Chemistry, Technology of Medicinal Substances, Processes and Apparatuses, Chemical-Pharmaceutical Technology. Skills acquired by laboratory training.

ASSESSMENT: Examination in written with oral explanations.

APPLIED MATHEMATICS

ECTS CREDITS: 3

HORARIUM: Lectures	Hours per week - 1	Weeks - 15
Practicals	Hours per week - 2	Weeks - 15

SEMESTER: II

CONTENTS: Elements of combinatorics and classical probability theory - random experiments and events; statistical, classical and geometrical probability, basic formulae for the probability of a random event; sequences of independent experiments; random quantities and their numerical characteristics; theorem of Chebishev, Bernouli law for big numbers and theorem of Liapunov; elements of the mathematical statistics; elements of the mathematical modelling.

OBJECTS: Knowledge of the basic sections of the probability theory, mathematical statistics and mathematical modelling that are necessary for the understanding of the quantitative methods and models of Physical Chemistry, Biochemistry, Biology, Medicine, Pharmacology and for the unaided solution of some of the problems often encountered in pharmaceutical research.

ASSESSMENT: examination

LATIN

ECTS CREDITS: 4

PREREQUISITES: None

HORARIUM:

Seminars Hours per week - 2 Weeks - 30

SEMESTER: I and II

CONTENTS: Notion of the Latin verb and the use of the imperative mood and some verbal forms in pharmaceutical terminology.
Noun, adjective and numeral and their use in the specialized pharmaceutical language. Word-building: prefixes, suffixes, term elements of Latin and Greek origin by means of which the complex medical and pharmaceutical terms have been created and are created at present. General rules in chemical nomenclature and in the formation of the denomination of drugs.

Basics of the botanical nomenclature.

Basic terms in pharmacognosy. Prescription - principles in making out a prescription, specific formulae in Latin and generally accepted abbreviations.

OBJECTS: Formation of a stable terminological basis in the beginning of the education in pharmacy which would facilitate the gaining of knowledge on the other objects foreseen in the teaching program.

ASSESSMENT: Current control - oral and written, semester works in written, examination.

FOREIGN LANGUAGE

ECTS CREDITS: 8

HORARIUM:

Seminars Hours per week - 4 Weeks - 30

SEMESTER: I and II

CONTENTS: Human anatomy; disease: its symptoms and treatments; history of pharmacy; the scope of pharmacy today; basic botanical terms, basic drug formulations; topical corticoids, antibiotics, neurotropic and phsychotropic agents, antirheumatic, anti-inflamatory, antipyretic, etc., drugs.

OBJECTS: Ability to get basic information from a specialized text, work with key words, ability to construct a structure-sense diagram of the text, compression of the content, preparation of summaries and annotations, work with tables, schemes and plots.

ASSESSMENT: Current control, oral and written; semester work in written. Check of an unaided translation of a specialized text from English to Bulgarian.

HUMAN PHYSIOLOGY

ECTS CREDITS: 6

HORARIUM: Lectures	Hours per week - 4	Weeks - 15
Practicals	Hours per week - 2	Weeks - 15

SEMESTER: IV

CONTENTS: Structure and function of cells, organs and systems building up the human organism. Mechanism, regulation and adaptation of physiological functions. Physiological methods for the investigation with applications in clinical and experimental practice.

OBJECTS: Understanding of the mechanism of action of medicinal substances

ASSESSMENT: Oral and written examination at the end of the third semester.

HUMAN ANATOMY

ECTS CREDITS: 3

HORARIUM: Lectures	Hours per week - 2	Weeks - 15
Practicals	Hours per week - 1	Weeks - 15

SEMESTER: III

CONTENTS: Structure and function of cells, organs and systems building up the human organism. Mechanism, regulation and adaptation of physiological functions. Physiological methods for the investigation with applications in clinical and experimental practice.

OBJECTS: Understanding of the mechanism of action of medicinal substances

ASSESSMENT: Oral and written examination at the end of the third semester.

PATHOANATOMY

ECTS CREDITS: 2

HORARIUM: Lectures	Hours per week - 1	Weeks - 15
Seminars	Hours per week - 1	Weeks - 15

SEMESTER: III

CONTENTS: Processes of general pathoanatomy: necrosis and atrophy; disorders in the metabolism of tissues and cells, disorders in the development of the organism (teratology); drug injuries (drug disease), etc.

OBJECTS: Basic theoretical knowledge in the field of medicine in order to facilitate the understanding of other teaching subjects.

ASSESSMENT: examination

COMPUTER TECHNOLOGIES

ECTS CREDITS: 2

HORARIUM: Practicals Hours per week - 2 Weeks - 15

SEMESTER: III

CONTENTS: Lay-out and principle of action of contemporary personal computers and related operation systems; contemporary text-processing, graphical, tabular, editing and communicative possibilities of computer systems - practical usage of the basic Internet and e-mail services.

OBJECTS: Gaining of knowledge on the lay-out and principle of action of contemporary personal computers and related operation systems; development of capabilities for the practical usage of contemporary computer systems and information technologies.

ASSESSMENT: examination

PATHOPHYSIOLOGY

ECTS CREDITS: 4

HORARIUM: Lectures	Hours per week - 2	Weeks - 15
Seminars	Hours per week – 2	Weeks - 15

SEMESTER: VII

CONTENTS: Processes of general pathology: disorders in the circulation; forms of inflammation; recreative growth and tumors; disorders in the development of the organism (teratology); drug injuries (drug disease), etc.

OBJECTS: Basic theoretical knowledge in the field of medicine in order to facilitate the understanding of other teaching subjects.

ASSESSMENT: examination

ANALYTICAL CHEMISTRY

ECTS CREDITS: 12

HORARIUM: Lectures	Hours per week - 2	Weeks - 30
Practicals	Hours per week - 4	Weeks - 30

SEMESTER: III and IV

CONTENTS: Qualitative analysis of cations and anions. Basic parts in the quantitative titrimetric analysis: acid-base equilibria, slightly soluble substances, complexometric equilibria, redox equilibria. Instrumental methods of analysis - potentiometry, spectrophotometry, chromatography (thin-layer chromatography and high-efficiency liquid chromatography).

OBJECTS: Gaining knowledge on the basic principles and methods of chemical analysis.

ASSESSMENT: Written and oral examination.

ORGANIC CHEMISTRY

ECTS CREDITS: 12

HORARIUM: Lectures Hours per week – 2 Weeks - 30
Practicals Hours per week - 4 Weeks - 30

SEMESTER: III and IV

CONTENTS: Nomenclature of organic compounds; structure of substances from the quantum-mechanical point of view; basics of stereochemistry; relationship between structure and reactivity; mechanisms of organic reactions; spectral methods of analysis (infrared spectroscopy, nuclear magnetic resonance, mass spectroscopy, electron spectroscopy); fatty and aromatic, saturated and unsaturated hydrocarbons; halogen derivatives, hydroxyl derivatives, aldehydes and ketones, carboxylic acids and their functional derivatives; fatty and aromatic amines; heterocyclic compounds with three- to six-atom cycles and one or two heteroatoms - oxygen, nitrogen and sulfur; purines and pteridines; organic compounds with biological activity; medicinal substances.

OBJECTS: Fundamental knowledge of organic chemistry necessary for the training in pharmaceutical chemistry, pharmacognosy, biochemistry, technology of drug forms, chemical-pharmaceutical technology and other specialized subjects.

ASSESSMENT: Written and oral examination

MICROBIOLOGY WITH VIRUSOLOGY

ECTS CREDITS: 8

HORARIUM: Lectures	Hours per week - 2	Weeks – 30
Practicals	Hours per week - 2	Weeks - 30

SEMESTERS: III and IV

CONTENTS: General microbiology, infection and immunity, special microbiology

OBJECTS: Knowledge of the morphology, structure and physiology of microorganisms causing contagious diseases; the principles and means of the treatment of contagious diseases using chemotherapy and bio preparations; the contagious process and the immunity of the organism; causes of various infections and principles of microbiological diagnostics as well as the significance of the normal human micro flora. Knowledge of the significance and application of microbiology for the specialty “Pharmacy”; modern biotechnologies using microorganisms for the preparation of antibiotics and other contemporary medicines; methods of microbiological analysis and control of medicines and bio preparations.

ASSESSMENT: Continuous assessment, written tests, colloquium, examination.

PHYSICAL CHEMISTRY WITH COLOID CHEMISTRY

ECTS CREDITS: 6

HORARIUM:	Lectures	Hours per week – 2/1	Weeks - 30
	Practicals	Hours per week – 2/1	Weeks - 30

SEMESTER: IV and V

CONTENTS: During the course the physical chemical principles in the pharmaceutical science are studied. The course includes: thermodynamics, solutions of electrolytes and nonelectrolytes, solubility and distribution phenomena, interfacial phenomena, colloids and rheology, kinetics – transition - state theory, catalysis, enzyme kinetics, pharmacokinetics, quantum-mechanical principles in description of the chemical structure, drug-biomacromolecule interactions.

OBJECTS: The physical chemical principles applied to the physical pharmacy, pharmacokinetics and pharmacodynamics.

ASSESSMENT: Written and oral examination.

PHARMACEUTICAL BOTANY

ECTS CREDITS: 8

HORARIUM: Lectures	Hours per week - 2	Weeks - 30
Practicals	Hours per week - 2	Weeks - 30

SEMESTER: IV and V

CONTENTS: Pharmaceutical botany includes anatomy of plants (cytology, histology, organography), morphology, physiology of plants, phytogeography and ecology. The natural resources of medical plants, the methods of their effective use, protection and reproduction are studied together with their importance as sources of biologically active substances.

OBJECTS: Knowledge, from the point of view of botany, of the medical plants in order to serve as a basis for the study of pharmacognosy.

ASSESSMENT: Current control, practical and theoretical examination

MEDICAL DEVICES

ECTS CREDITS: 2

HORARIUM:

Practicals Hours per week - 2 Weeks - 15

SEMESTER: V

CONTENTS: The facilities used in medical practice for conducting diagnostic, curative, etc., manipulation are studied. The nomenclature, type and function of medical appliances, apparatuses and instruments, their structural characteristics, the respective manner and conditions of operation, the changes that could occur upon their use and storage, the quality requirements they should suit, the methods of testing their qualities and fitness, the manner and rules for their approval are discussed.

OBJECTS: To provide information of the nomenclature, the methods of testing the quality and fitness of medical facilities, the regulations for their packing, transportation and storage.

ASSESSMENT: Colloquium.

PHARMACEUTICAL CHEMISTRY

ECTS CREDITS: 15

HORARIUM: Lectures	Hours per week - 3	Weeks - 30
Practicals	Hours per week – 4/5	Weeks - 30

SEMESTER: V and VI

CONTENTS: Classical and modern medicinal substances are studied on the basis of a combined pharmacotherapeutic and chemical classification. Each part includes characteristics, structure, chemical denomination, properties, methods of preparation, biotransformation, relationship between structure and activity. Possibilities are considered of alteration of properties, toxicity, etc.

OBJECTS: In-depth knowledge of the items listed above.

ASSESSMENT: Current control and written and oral examination.

BIOCHEMISTRY

ECTS CREDITS: 8

PRE-REQUISITES: Successfully passed examinations on Inorganic Chemistry, Analytical Chemistry and Organic Chemistry

HORARIUM: Lectures	Hours per week - 3	Weeks - 15
Practicals	Hours per week - 3	Weeks - 15

SEMESTER: V

CONTENTS: Structure and function of proteins and nucleic acids. Application of knowledge on polymers in the clinical practice. Enzymes. Clinical significance of enzymes. Antimetabolites. Bioenergetics. Citric acid cycle. Metabolism if carbohydrates. Metabolism of lipids. Metabolism of amino acids. Metabolism of nucleotides. Enzymopathies, related to metabolism. Integration and interrelations between metabolism of carbohydrates, lipids, amino acids and nucleotides. Metabolism of DNA, RNA and proteins. Carcinogenesis. Regulation of metabolism. Signal transduction. Hormones. Diabetes Mellitus. Biochemistry and functions of liver. Degradation and synthesis of porphyrins. Jaundices. Biochemistry of nutrition. Computer presentations are used at each lecture - Power Point illustrations and animations (molecular graphics) and other interactive programs.

This course is being now developed also for distance learning, appropriate for under- and post-graduates. The Web-based version of the course consists of lectures, interactive tests and simulations of clinical cases. Part of it is in the Internet: http://www.medfac.acad.bg/c&b/biochimia/content.html or http://biochemistry.dir.bg, or http://sites.portal.ngorc.net/biochemistry/egb/content.html

OBJECTS: As biochemistry is the study of the molecular basis of life, the goals of the unit are:

(i) to provide theoretical knowledge on the content, structure and functions of the cell components, on the chemical reactions and processes occurring in cells and their regulation, and to explain their significance for organisms in norm and in disease, giving in each category examples about the application of theory in the clinical practice;

(ii) to pass from passive teaching to active regular or distance problem-based learning via application of theory for solving interactive Web-based computer-simulated cases and to provide self-assessment of knowledge via tests;

to assure practical instruction and training in basic laboratory biochemical methods and professional teamwork.

ASSESSMENT: Oral and written examinations.

CLINICAL CHEMISTRY

ECTS CREDITS:4

HORARIUM: Lectures	Hours per week - 1	Weeks - 15
Practicals	Hours per week - 3	Weeks - 15

SEMESTER: VI

CONTENTS: Theoretical aspects of clinical chemistry in the following sections - general problems concerning the materials used for investigation, types of errors in laboratory diagnostics, reference limits and values, analytical reliability of the methods, assurance of quality in clinical laboratories; basic knowledge on the methods used for the study of electrolytes, oligoelements, indices of the alkali-acidic state of blood, carbohydrates, proteins, enzymes, non-protein nitrogen-containing substances, lipids, hormones, drugs and drug monitoring. During the exercises, the students get skilled in the clinical chemistry practice, the interpretation of the results and their clinical significance.

OBJECTS: Skills for work in clinical laboratories as specialists in clinical chemistry
ASSESSMENT: Oral examination

PHARMACEUTICAL TECHNOLOGY, Part 1

ECTS CREDITS: 14

HORARIUM: Lectures	Hours per week - 2	Weeks - 30
Practicals	Hours per week - 5	Weeks - 30

SEMESTER: V and VI

CONTENTS: Conventional drug dosage forms - pulveres, liquida, unguenta, suppositoria, etc., pharmaceutical operations and pharmacopoeal characteristics.

OBJECTS: Providing the basic knowledge and practical skills in the preparation and characterization of conventional drug dosage forms.

ASSESSMENT: Tests, practical exams, written and oral examinations.

PHARMACOGNOSY, Part 1

ECTS CREDITS: 14

HORARIUM: Lectures	Hours per week - 2	Weeks - 30
Practicals	Hours per week - 5	Weeks - 30

SEMESTER: VI and VII

CONTENTS: The curative raw materials of animal and vegetal origin are studied using physical, chemical, physicochemical and biological methods.

OBJECTS: Identification, elucidation of the qualitative and quantitative content of biologically active compounds in drugs.

ASSESSMENT: Current control, practical and theoretical examinations.

PHARMACOLOGY

ECTS CREDITS: 12

HORARIUM: Lectures	Hours per week - 2	Weeks - 15
Practicals	Hours per week - 4	Weeks - 15

SEMESTER: VI and VII

CONTENTS: During the sixth semester, the basic concepts of general pharmacology, necessary for the accumulation of fundamental information concerning the medicinal effect are studied. During this semester, the study of the special pharmacology, in its parts on the central and autonomous neural systems is also starting. During the seventh semester, the drugs affecting the cardio-vascular system, the cell-mediated systems, the endocrine system are studied. Furthermore, the course includes the study of the microbiological, pharmacodynamic, pharmacokinetic and healing aspects of the clinically applied antiinfectious drugs; the principles of chimiotherapy for the selective toxicity with respect to bacterial, viral and fungal infectious causes are considered together with the chimiotherapy of malignant tumors and chemoblastoses.

OBJECTS: On the basis of the already acquired knowledge on the essence of the physiological and pathophysiological processes in the organism, to focus on the medicinal effects of the various pharmacological remedies, with good knowledge of their pharmacodynamics, pharmacokinetics, therapeutic indications and undesired reactions.

ASSESSMENT: Oral and written examination; practical examination based on tests; colloquia during the exercises; preparation of a thesis during the seminars.

SOCIAL PHARMACY AND PHARMACEUTICAL LEGISLATION

ECTS CREDITS: 10

HORARIUM: General Profile

Lectures	Hours per week - 2	Weeks - 30
Practicals	Hours per week - 3	Weeks – 30

SEMESTER: VI and VII,

CONTENTS: Possibility of harmonization of the problems of pharmaceutical legislation, management and marketing, and the good pharmaceutical practice in Bulgaria with those of the European countries.

OBJECTS: To create an overall concept on the stages from the investigation of drugs to their effective application to patients.

ASSESSMENT: Practical examination and oral examination.

HYGIENE AND ECOLOGY

ECTS CREDITS: 3

HORARIUM: Lectures	Hours per week - 2	Weeks - 15
Seminars	Hours per week - 1	Weeks - 15

SEMESTER: VII

CONTENTS: Basic ecological problems of pollution, protection and control of atmospheric air, waters and soils; effect on human health; physiology of nutrition; biological and chemical safety of foods; nutritional diseases; hygienic requirements to the design and exploitation of pharmacies; safety in the production of medicinal substances; physical, chemical and biological factors of the working environment and related professional diseases with emphasize on the specific pathology in the cases of pharmacy personnel and workers in the chemical-pharmaceutical industry; infection and epidemic processes, antiepidemic measures, ecological and antiepidemiological regularities of the infections of the respiratory system, intestinal, transmitive and coating infections.

OBJECTS: Possibilities of participation in the system for the monitoring of environment, incl. biomonitoring; sanitary control in pharmacies; participation in the development of prophylactic programs, in antiepidemic activities.

ASSESSMENT: Test and theoretical examination (oral and written).

PHARMACEUTICAL TECHNOLOGY RMACY, Part 2

ECTS CREDITS: 15

HORARIUM: Lectures	Hours per week - 2	Weeks - 30
Practicals	Hours per week – 5/6	Weeks - 30

SEMESTER: VII and VIII

CONTENTS: Classical and modern approaches to the development and characterization of drug dosage forms: solid - (granules, capsules, tablets), sterile - (Parenteralia, Ophthalmica) and phytotherapeutica. Modern requirements for effective and safe dosage forms.

OBJECTS: Basic theoretical and practical knowledge of the formulation, production and control of dosage forms.

ASSESSMENT: Tests, practical examination, written and oral examinations.

PHARMACEUTICAL ANALYSIS

ECTS CREDITS: 15

HORARIUM: Lectures	Hours per week - 2	Weeks - 30
Practicals	Hours per week – 5/6	Weeks - 30

SEMESTER: VII and VIII

CONTENTS: Possibilities of functional analysis and instrumental methods of analysis (spectroscopy in the UV, visible and IR spectral regions, chromatography, etc.) for the identification and assessment of the amount and purity of the medicinal substances are considered.

OBJECTS: To assure knowledge and skills in the quality control of medicinal substances.

ASSESSMENT: Written and oral examinations.

PHARMACOECONOMY

ECTS CREDITS: 5

HORARIUM: Lectures	Hours per week - 2	Weeks - 15
Practicals	Hours per week - 3	Weeks - 15

SEMESTER: VIII

CONTENTS: It compares the value of one pharmaceutical drug or drug therapy to another. It is a sub-discipline of health economics. A pharmacoeconomic study evaluates the cost (expressed in monetary terms) and effects (expressed in terms of monetary value, efficacy or enhanced quality of life) of a pharmaceutical product. There are several types of pharmacoeconomic evaluation: cost-minimization analysis, cost-benefit analysis, cost-effectiveness analysis and cost-utility analysis. Pharmacoeconomic studies serve to guide optimal healthcare resource allocation, in a standardized and scientifically grounded manner.

OBJECTS: Knowledge of the basic theoretical requirements and practical skills related to this teaching subject.

ASSESSMENT: written and oral examination

TOXICOLOGY

ECTS CREDITS: 8

HORARIUM: Lectures	Hours per week - 2	Weeks - 15
Practicals	Hours per week - 4	Weeks - 15

SEMESTER: VIII

CONTENTS:

(a) General toxicology - basic modern principles of medicinal toxicology, toxicokinetics and toxicodynamics, mechanisms of toxic action, undesired effects of drugs, drug safety - monitoring of the undesired effects of drugs, genetoxic, mutagenic, cancerogenic, teratogenic, immunotoxic action, biotransformation - enzyme mechanisms, cytochrome P450, factors affecting toxicity (endogenic and exogenic), toxicological aspects of medicinal interactions, misuse of drugs, drug dependence, toxicomanias.

(b) Special toxicology - texicological characterization of basic pharmacological groups, mechanisms of the medicinal injuries of organs and systems, injuries by nonmedicinal agents - alcohol and nicotine, interaction with drugs, toxic substances from the environment: pesticides, heavy metals, organic solvents, industrial and domestic gases, etc., - effect on the biotransformation processes, toxicologic characteristics of medical plants and nutritive additives, acute medicinal intoxications - modern antidotes, detoxicants.

OBJECTS: On the basis of the already acquired knowledge in the field of medicinal toxicology, to provide a possibility of effective participation in the process of optimization and safety of medicinal therapy as well as of prevention of drug misuse.

ASSESSMENT: Oral and written examination, colloquia during the practicals, preparation of a thesis during the seminars, current control by tests.

MEDICAL GENETICS

ECTS CREDITS: 2

HORARIUM: Lectures	Hours per week - 1	Weeks - 15
Seminars	Hours per week - 1	Weeks - 15

SEMESTER: VIII

CONTENTS: The etiology of inherited diseases, chromosome diseases and differential diagnosis with the teratogene effects of drugs and other exogenic factors in the etiology and pathogenesis of innate malformations are considered. Basic classes molecular diseases with emphasize on the pharmacogenetic defects, enzymopathies, defects in the connective tissue and the role of genetic factors in the oncogenesis as well as approaches to genetic prophylaxis and therapy, and principles of gene therapy are also included.

OBJECTS: Basic knowledge of the problems of inherited pathology.

ASSESSMENT: examination

PHARMACOTHERAPY

ECTS CREDITS: 10

HORARIUM: Lectures	Hours per week - 2	Weeks - 30
Practicals	Hours per week - 3	Weeks - 30

SEMESTER: VIII and IX

CONTENTS: The clinics and medical treatment of the following syndromes and diseases are considered: the infectious-inflammatory syndrome with lung localization, incl. bronchial asthma as well as the bronchiospastic syndrome; the syndrome of cardiac insufficiency, the thromboembolic syndrome and dislipidemias, hypertonia; the syndrome of cardiac inhemia, cardiac arythmia; hyperacidic syndrome; noninfectious-inflammatory syndrome; malignant tumors and chemoblastoses; hyperglycemia and other endocrine disorders; dermatologic diseases; cerebral-vascular disease; undesired reactions caused by prolonged pharmacotherapy are studied.

OBJECTS: To provide information on the clinics of various syndromes and diseases of internal medicine, on the mechanisms of the pathologic process and on the pharmacotherapeutical approaches to their effective healing.

ASSESSMENT: Written and oral examinations, colloquia during the practicals.

BIOPHARMACY AND PHARMACOKINETICS

ECTS CREDITS: 8

HORARIUM: Lectures	Hours per week - 2	Weeks - 15
Practicals	Hours per week - 6	Weeks - 15

SEMESTER: IX

CONTENTS: Drug delivery systems - development and characterization; stability and stabilization of drugs, methods of assessment of the drug stability and of prediction of the drug shelf-life. Methods for the biopharmaceutical study of dosage forms; in vitro release and dissolution - mathematical evaluation and modes of presentation of the results. Pharmaceutical and bio-equivalence of drug preparations.

OBJECTS: To provide knowledge on modern drug delivery systems; basic methods for the evaluation of drug stability and stabilization, biopharmaceutical characterization of drug dosage forms.

ASSESSMENT: Tests, practical examinations, written and oral examinations.

PHARMACOGNOSY, Part 2

ECTS CREDITS: 8

HORARIUM: Lectures	Hours per week - 2	Weeks - 15
Practicals	Hours per week - 4	Weeks - 15

SEMESTER: IX

CONTENTS: Extraction of drugs from freely growing and cultivated medicinal plants - advantages and drawbacks. Standardization of drugs and standard documents. Methods of isolation, identification, qualitative and quantitative analysis of biologically active substances of vegetal origin. Types of phytopreparations and stages of their manufacturing. Phytopreparations from various groups naturally occurring substances. Chemotaxonomy and significance for pharmacy.

OBJECTS: On the basis of the theoretical knowledge acquired from Pharmacognosy, Part 1, to provide the students with practical skills in this respect.

ASSESSMENT: Examination oral and written.

BROMATOLOGY

ECTS CREDITS: 4

HORARIUM:	Lectures	Hours per week - 2	Weeks - 15
	Practicals	Hours per week - 2	Weeks - 15

SEMESTER: IX

CONTENTS: Composition of foods - proteins, fats, carbohydrates, vitamins, mineral salts, nutrient additives; drug-food interactions on the level of resorption, distribution, metabolism, excretion; food-poisonings of chemical and microbiological origins.

OBJECTS: To assure knowledge of the methods of food analysis and of the drug-food interactions.

ASSESSMENT: Colloquium, written and oral examinations.

PHARMACEUTICAL CARE

ECTS CREDITS: 5

HORARIUM: Lectures	Hours per week - 2	Weeks - 15
Seminars	Hours per week - 3	Weeks - 15

SEMESTER: IX

CONTENTS: Scientific principles and international requirements at every stage of drug therapy for the purpose of achieving the elimination or reduction of a patient's symptomatology; arresting or slowing of a disease process; or preventing a disease or symptomatology. This process requires a review of patient's medication with reference to the doctor's diagnoses, laboratory tests and patient's information. It teaches good communication skills in order to gain a correct understanding of the relevance and impact of the various medications on the patient's pathology.

OBJECTS: Knowledge of the modern strategies in providing quality and safety at every stage of drug treatment.

ASSESSMENT: Examination.

OPTIONAL COURSE

ECTS CREDITS: 4

HORARIUM: Lectures	Hours per week - 2	Weeks - 15
Practicals	Hours per week - 2	Weeks - 15

SEMESTER: IX

CONTENTS: depends on the course

OBJECTS: Knowledge of the basic theoretical requirements and practical skills related to this teaching subject.

ASSESSMENT: Examination in written