**Fächer und Kursinhalte, FB16 (Stand: 2012) / Subjects and course contents, Faculty of Pharmacy (Status: 2012)**

Link zum Vorlesungsverzeichnis / Link to course lists: <https://qis.verwaltung.uni-marburg.de/qisserver/rds?state=wtree&search=1&category=veranstaltung.browse&navigationPosition=lectures%2Clectureindex&breadcrumb=lectureindex&topitem=lectures&subitem=lectureindex> 🡪 **Choose ‘Department 16 – Pharmacy’** or ‘Fachbereich 16 Pharmazie’ + Choose **Language (upper right side of the page)**

For semester 5-7 see also table „lecture series“, page 35

| **Nr. / No.** | **Sem****ester** | **Kursnr. / Course number** | **Kursname / Course title (German title)**  | **Kursbeschreibung / Course description** | **h pro Wo./ Sem. /** **h per** **week/****semester** | **Kurstyp / Course type** | **ECTS / ECTS points** | **Prüfung (Klausur, Kolloquium…) / Examination (written exam, colloquium…)** | **Nummer d. zugehörigen Vorlesung/Praktikums (falls vorhanden)Number of associated lecture/practical course (if applicable)** | **Schein (nur bei Teilnahme am dazugehörigen Praktikum) / German title of the certificate awarded at the end of the course (only at participation in the associated practical course)** | **Verantwortlicher / Name of the person/people responsible for the course** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 1 | 16 133 10010 | Chemie für Pharmazeuten / Chemistry for Pharmacists  | Introductory course in general chemistry | 4 h /56 h | Vorlesung / Lecture | 4 | - | 16 133 10020 | Allgemeine und analytische Chemie der anorganischen Arznei-, Hilfs- und Schadstoffe | Steinmetzer |
|  | 1 | 16 133 10020 | Allgemeine und analytische Chemie der anorganischen Arznei-, Hilfs- und Schadstoffe / Qualitative inorganic analysis  | The student should learn to identify inorganic ions in a mixture of various compounds. Therefore a sample is given to the student, which has to perform several chemical reactions in the laboratory, which lead to conclusions concerning the actual content of the provided sample.This laboratory practice is a very good first lesson, how to work properly in a lab and how to deal responsibly with chemical substances. It teaches students, how and why compounds react like they do and trains the comprehension of inorganic chemistry. | 12 h / 168 h | Praktikum / Lab | 12 | Klausur / Written Exam | 16 133 10010 | Allgemeine und analytische Chemie der anorganischen Arznei-, Hilfs- und Schadstoffe | Steinmetzer |
|  | 1 | 16 125 50010 | Pharmazeutische und medizinische Terminologie / Pharmaceutical and medical terminology  | In these lectures students learn the vocabulary to understand and deal with a prescription including technical terms and abbreviations, pharmaceutical terms for chemical substances and to understand and use medical terms of pathology, pharmacology and anatomy. The lectures contain vocabulary in Greek as well as in Latin and a short synopsis of Latin grammar. The course is completed by writing an examination, which only counts as passed when the student also passes the examination in History of Sciences (number 18 in this list). | 2 h / 26 h | Seminar | 2 | Klausur / Written Exam | - | Pharmazeutische und medizinische Terminologie | Friedrich/Anagnostou |
|  | 1 / 2 | 16 131 30010 | Allgemeine Biologie für Pharmazeuten: Systematik der Mikroorganis­men und Arzneipflanzen (nur im SoSe)/ Basic biology for pharmacists: systematic of microorgan­isms and medicinal plants (only in summer term) | All living organisms can be sorted into a system according to their relationship and their evolution. The lecture introduces the classification of microorganisms and plants with special emphasis on those that are important for pharmacists as pathogens or producers of pharmaceutical compounds. | 2 h /28 h | Vorlesung / Lecture | 2 | - | 16 125 3004016 125 30045 | 16 125 3004016 125 303045 | Petersen |
|  | 1 / 2 | 16 131 30011 | Allgemeine Biologie für Pharmazeuten: Cytologie und Virologie (nur im WS)/ Basic biology for pharmacists: cytology and virology (only in winter term) | This lecture deals with the internal anatomy of living prokaryotic (bacteria) and eukaryotic (plants, fungi, animals) cells. The structures and functions of all cellular organelles are explained. In the last part of the lecture, the students get an introduction to viruses and other sub-cellular pathogens. | 2 h / 28 h | Vorlesung / Lecture | 2 | - | 16 131 3004116 131 30042 | 16 131 3004116 131 30042 | Petersen |
|  | 12 | 16 125 30040(1. Semester)16 125 30045(2. Semester)only summer term | Bestimmungs­übungen und Arzneipflanzenexkursionen / Plant classification and excursions(only summer term) | The students learn how to classify plants with help of field guides. The characteristics of important plant families are introduced. This knowledge can be applied and improved in two field excursions | 2 h / 28 h | Praktikum und Exkursionen / Practical course and excursions | 2 | Klausur / Written Exam | 16 131 30010 | Zytologische und histologische Grundlagen der Biologie / Arznei­pflanzenexkursio­nen und Bestim­mungs­übungen / Pharmazeutische Biologie I: Unter­suchung arznei­stoffproduzierender Organismen des Stoffgebiets D Grundlagen der Biologie und Humanbiologie | Petersen |
|  | 1 2 | 16 131 30041(1. Semester)16 131 30042(2. Semester)(only winter term) | Cytologische und histologische Übungen / Cytology and histology  | In this course the students learn to look at plant and animal tissues with help of a microscope. They apply specific staining techniques to detect specific compounds and structures of the cells. The observations are documented in drawings. | 2 h / 28 h | Praktikum / Practical course | 2 | Klausur / Written Exam | 16 131 30011 | Zytologische und histologische Grundlagen der Biologie / Arznei­pflanzenexkursio­nen und Bestim­mungs­übungen / Pharmazeutische Biologie I: Unter­suchung arznei­stoffproduzieren­der Organismen des Stoffgebiets D Grundlagen der Biologie und Humanbiologie | Petersen |
|  | 1 | 16 125 40035  | Toxikologie der Hilfs- und Schadstoffe / Toxicology for pharmacists | In this course, students receive a basic introduction into toxicology, including the mechanisms, symptoms and treatments of some common intoxications such as poisoning with Atropa Belladonna, cyanide or heavy metals. | 2 h/ 22 h | Seminar | 2 | Klausur / Written exam | - | Toxikologie der Hilfs- und Schadstoffe des Stoffgebiets A: Allgemeine Chemie der Arzneistoffe, Hilfsstoffe und Schadstoffe | Bünemann, Culmsee, Krasel |
|  | 1 / 2 | 13 132 80030summer term only | Einführung in die Physik I für Pharmazeuten (nur im WS) / Physics for students of Pharmacy (only in winter term) | These lectures include experiments and explanations about mechanics, thermodynamics, acoustics and radioactivity as well as clarification of magnetism and optics. In the last 20 minutes, example problems on the lecture subject are posed and enumerated as they occur in the examinations that accompany the practical course. |  2 h / 42 h  | Vorlesung / Lecture | 2 | Klausur zusammen mit / Exam together with 13 132 80173 | 13 132 80173 = Übungen in Physik und Physikalischer Chemie / Exercises in physics andphysical chemistry | Physikalische und Physikalisch-Chemische Übungen für Studierende der Pharmazie (Praktikum) | Einhäuser-Treyer |
|  | 1 | 12 119 10102 | Mathematische und statistische Methoden für Pharmazeuten / Mathematics for Pharmacists | To evaluate a chemical and pharmaceutical laboratory test-run one needs some mathematical formulas. These formulas are practised and illustrated quite clearly in examples in step with actual practice. This Coursework includes weekly homework which trains the skills of handling scientific results as presented in everyday problems. | 2 h / 28 h | Seminar und Übungen / Seminar and exercises | 3  | Klausur / Written exam | - | Mathematische und statistische Methoden für Pharmazeuten | Strauer |
|  | 1 | **16 125 40010****summer term only**(winter term see 16 125 40011) | Grundlagen der Anatomie und Physiologie I / Anatomy and Physiology for Pharmacists I | In these lecture sessions, the anatomy and physiology of the human body is explained comprehensibly by a clear division into the following topics: 1) Cell physiology; 2) Blood; 3) The heart; 4) The circulation; 5) The lung; 6) The kidneys. Major diseases and drugs relevant for the respective organs are also briefly discussed. | 3 h / 42 h | Vorlesung / Lecture | 3 | - | 16 125 40040 | - | Kockskämper |
|  | 2 | 16 125 10030 | Quantitative Bestimmung von Arznei-, Hilfs- und Schadstoffen / Quantitative inorganic analysis | These lectures provide the theoretical background to the Quantitative inorganic analysis (number 13 in this list). The lectures discuss and consider critically different kinds of qualitative qua**nt**itative analyses such as argentometry according to Vol**l**hardt Volhardt, Mohr, Liebig and Fajans, volumetric analysis which includes acid/base titration, titration in non-aqueous solutions, preparation and calibration of standard solutions as well as the correct evaluation and calculation of the analysis results. | 3 h / 42 h | Vorlesung / Lecture | 3 | - | 16 125 10040 | - | Reuter |
|  | 2 | 16 125 10040 | Quantitative Bestimmung von Arznei-, Hilfs- und Schadstoffen (Praktikum) / Quantitative inorganic analysis (Lab) | In the first semester student s are confronted with the task to find out what kind of inorganic chemical element their probe contains. Now in continuation to that, the student definitely knows what is in the probe but has to find out how much is in it. The student does this via titration by using burettes, gravimetric analyses or elektrolyses. All these tasks are in consideration of the Pharmacopoea Europaea. It is also goood training in Teamwork, because students have to work in couples. | 10 h / 140 h | Praktikum / Lab | 10 | Kolloquium und Klausur / Oral and written exam | 16 125 10030 | Quantitative Bestimmung von Arznei-, Hilfs- und Schadstoffen | Reuter |
|  | 2 | 13 132 80173 | Physikalische Übungen für Pharmazeuten / Exercises in physics | 5 physical experiments are performed in each of the fields of mechanics, optics, electricity and nuclear physics.Students work in groups of two. For each experiment, a protocol is written which includes calculations, diagrams and evaluations presented as tables. | 2 h / 28 h | Praktikum und Übungen / Exercises/Lab | 2 | Klausur / Written exam in physics | 13 132 80030(lecture winter term)13 132 80040(lecture winter term) | Physikalische Übungen für Studierende der Pharmazie (Praktikum) | Feuser |
|  | 2 | 13 132 80173 | Physikalisch-chemische Übungen für Pharmazeuten/Exercises in physical chemistry | 5 physical-chemical experiments are performed in each of the fields of fluids, thermodynamics and electrolytical electricity.Students work in groups of two. For each experiment, a protocol is written which includes calculations, diagrams and evaluations presented as tables. | 2 h / 28 h | Praktikum und Übungen / Exercises/Lab | 2 | Klausur / Written exam (for physico-chemical exercises) | 13 132 80030(lecture winter term)13 132 80040(lecture winter term) | Physikalisch-Chemische Übungen für Studierende der Pharmazie (Praktikum) | Feuser |
|  | 2 | 16 125 40040 | Kursus der Physiologie / Physiology  | In these practical courses, students do experiments on the following topics: 1) The heart – Recording and analysis of the ECG; 2) The cardiovascular system – Blood pressure regulation; 3) Skeletal muscle – Simulation studies on skeletal muscle function; 4) The neuron – Simulation studies on the neuronal action potential; 5) The lung – Determination of lung function; 6) The senses – Vision and hearing. Each practical course starts with an introduction to the field and is finished with a discussion of the results. | 5 h / 30 h | Übungen / Exercises | 3 | Klausur / Written exam | 16 125 40010 +16 125 40011 | Kursus der Physiologie | Kockskämper |
|  | 1 / 2 | 13 132 80040winter term only | Einführung in die Physik II für Pharmazeuten (nur im SoSe) / Physics for students of Pharmacy II (only in summer term) | These lectures include experiments and explanations about mechanics, thermodynamics, acoustics and radioactivity as well as clarification of magnetism and optics. In the last 20 minutes, example problems on the lecture subject are posed and enumerated as they occur in the examinations that accompany the practical course. | 2 h / 42 h | Vorlesung / Lecture | 2 | Klausur zusammen mit / Exam together with 13 132 80173 | 13 132 80173 = Übungen in Physik und Physikalischer Chemie / Exercises in physics andphysical chemistry |  | Parak |
|  | 2 | 16 125 50020 | Geschichte der Naturwissenschaften unter besonderer Berücksichtigung der Pharmazie / History of the Sciences(with emphasis on pharmacy) | The Institute for the History of Pharmacy is a distinctive feature of the faculty of pharmacy of the Philipps-University in Marburg. It is an independent institution and is therefore unique in the German-speaking world. The course of lectures provides an overview starting with the beginnings of pharmacy up to the 20th century. Teaching and research are concerned with the development and problems of Sciences, and in particular with pharmacy and its basic subjects of Chemistry and Botany, all within the larger framework of the History of Science. The main periods of time to be looked at are the Middle Ages, the Renaissance and the 18th to 20th centuries.  | 2 h / 26 h | Lecture | 2 | Klausur / Written Exam | - | Geschichte der Naturwissenschaften unter besonderer Berücksichtigung der Pharmazie | Friedrich |
|  | 2 | 16 125 20010 | Grundlagen der Arzneiformenlehre / Basics of pharmaceutical technology | In this series of lectures, the student is made familiar for the first time with methods of preparation of medications. Basic concepts such as the GMP guidelines and the differences between single-part production and industrial scale production are clarified. Furthermore, various machines and appliances that are used mainly in the pharmaceutical industry are presented. Homoeopathy and Traditional Chinese Medicine are also briefly introduced. | 2 h / 28 h | Vorlesung / Lecture | 2 | - | - | - | Bakowsky / Schäfer |
|  | 2 | 16 125 40011only winter termsummer term see16 125 40010 | Grundlagen der Anatomie und Physiologie II / Anatomy and Physiology for Pharmacists II | In these lecture sessions, the anatomy and physiology of the human body is explained comprehensively by a clear division into the following topics: 1) Cell physiology; 2) The gastrointestinal system; 3) The endocrine system; 4) Skeletal muscle; 5) The nervous system. Major diseases and drugs relevant for the respective organs are also briefly discussed. | 3 h / 42 h | Vorlesung / Lecture | **3** | - | 16 125 40040 | - | Kockskämper |
|  | 3 | 16 125 10050  | Pharmazeutische und medizinische Chemie / Pharmaceutical and medical chemistry  | The lecture teaches the fundamentals of organic chemistry with special emphasis on pharmaceutical application and drugs. After covering the basics like molecular orbital theory, chemical binding, polarisation, thermodynamics and kinetics, reaction mechanisms are explained in detail. Relevant classes of organic compounds are explained in terms of structure, properties and typical reactions. Special emphasis is placed on the dependence of properties (e.g. pKa) and reactivity (stability) on substituent effects. Pharmaceutical applications and relevance for biochemical pathways is demonstrated whenever possible.  | 5 h / 70 h | Vorlesung / Lecture | 5 | - | 16 125 1008016 125 10075 | Chemische Nomenklatur einschließlich Chemie der Analytik der organischen Arzneistoffe, Hilfsstoffe und Schadstoffe(auch ohne Belegung der Vorlesung / also without assignment to the lecture) | Schlitzer |
|  | 3 | 16 125 10075  | Chemische Nomenklatur / Nomenclature of organic chemistry | This seminar teaches the basics of organic nomenclature. IUPAC rules are explained and practised with different examples as well as the Cahn-Ingold-Prelog-System. Learning success is evaluated in course of the written examination in Organic Chemistry. | 1 h / 14 h | Seminar | 1 | Klausurwritten exam(same as 16 125 10080) | 16 125 10080 | Chemische Nomenklatur einschließlich Chemie der Analytik der organischen Arzneistoffe, Hilfsstoffe und Schadstoffe | Schlitzer |
|  | 3 | 16 125 10080  | 1. Chemie der organischen Arznei-, Hilfs- und Schadstoffe

/ Organic chemistry, drug substance synthesis | Basic techniques in preparative organic chemistry (e.g. refluxing, moisture exclusion, solvent drying, solvent extraction, distillation, recrystallization etc.) are demonstrated and applied by the students with the synthesis of different drugs or analytically important drug derivatives. Products are characterized in terms of yield and purity. | 12h / 168h | Praktikum / Lab | 12 | Klausur / Written exam(same as 16 125 10075) | 16 125 10050  | Chemische Nomenklatur einschließlich Chemie der Analytik der organischen Arzneistoffe, Hilfsstoffe und Schadstoffe | Schlitzer |
|  | 3 | 16 125 30050  | Pharmazeuti­sche Biologie I: Untersu­chung arznei­stoff­pro­du­zie­render Orga­nis­men / Pharmaceutical Biology I: drug-producing organisms  | With help of the light microscope the students learn how different plant organs are built up from differentiated cells. Plant organs and tissues are prepared and stained for microscopic inspection and the microscopic aspects drawn. | 3 h / 42 h | Praktikum / Practical course | 3 | Klausur / Written Exam | 16 131 30030  | Zytologische und histologische Grundlagen der Biologie / Arznei­pflanzenexkursio­nen und Bestim­mungs­übungen / Pharmazeutische Biologie I: Unter­suchung arznei­stoffproduzieren­der Organismen des Stoffgebiets D Grundlagen der Biologie und Humanbiologie | Petersen |
|  | 3 | 16 131 30030  | Allgemeine Biologie für Pharmazeuten: Morphologie und Anatomie / Basic biology for pharma­cists: anatomy and morphology  | How is a plant built and how does it live? This lecture deals with the structure of plants, their organs and their different tissues. | 2 h / 28 h | Vorlesung / Lecture | 2 | - | 16 125 30050  | 16 125 30050 | Petersen |
|  | 3 | 16 131 30025  | Allgemeine Biologie für Pharmazeuten: Grundlagen der Biochemie, Physiologie und Genetik / Basic biology for pharmacists: biochemistry, physiology and genetics  | Which molecules are essential for life? How does an organism gain energy? How do plants use light to synthesise sugars? How is the information of life stored and encoded?These are only some of the questions that will be answered in a detailed overview on the biochemistry, physiology and genetics of living organisms in this lecture. | 3 h / 42 h | Vorlesung / Lecture | 3 | - | 16 125 30050 | 16 125 30050 | Petersen |
|  | 3 | 16 125 20030 just possible in combination with seminar16 125 20030 | Arzneiformenlehre / Pharmaceutical Technology I | In these practical laboratory exercises, students work in teams. On the basis of the lectures which introduce the students to technical production methods in the pharmaceutical industry, various dosage forms are recreated and declared in accordance with industrial standards. Dosage forms include suppositories, dilutions, ointments and capsules. | 5 h / 70 h | Praktikum / Lab | 5 | Klausur / Written exam | 16 125 20010 | Arzneiformenlehre einschließlich physikalischer und physikalisch-chemischer Übungen | Bakowsky / Schäfer |
|  | 4 | 16 125 10110  | Instrumentelle Analytik (Praktikum) / Instrumental analysis (laboratory) | This Laboratory work is teamwork based and includes experiments in chromatographical analyses, for example thin layer chromatography , gas chromatography and high performance chromatography, as well as electrochemical experiments (Dead Stop, potentiometry), optical experiments such as polarimetry, fluorescent and spectroscopic experiments for example UV, visible and IR spectrometry. Since 2009 the methods of structure elucidation (mass spectrometry and nuclear resonance spectroscopy) are part of the laboratory. | 12h / 168h(Praktikum wird als 3-wöchiger Block durchgeführt / Lab is organized as a 3 week course block) | Praktikum / Lab | 12 | Zwischenkolloq nach der Hälfte der Versuche / Intermediate testing after the first half of experiments | 16 125 10090 | Instrumentelle Analytik | Keusgen |
|  | 4 | 20 121 80006 until sommer term 2011**16** 121 80006since winter term 11/12 | Einführung in die medizinische Mikrobiologie, Hygiene und Immunologie für Pharmazeuten / Introduction to medical microbiology, hygienics and immunolgy for Pharmacists | This lecture treats various symptoms that are caused by bacteria, viruses, worms and fungi. Also discussed is how far it is possible to influence the development and course of the illness, for example by inoculation of change of life style. Epidemiological considerations are also treated.  | 2 h / 28 h | Vorlesung / Lecture | 2 | Klausur / Written exam | 16 121 80007 | Medizinische Mikrobiologie für Pharmazeuten | [Cherkasov](https://qis.verwaltung.uni-marburg.de/qisserver/rds?state=verpublish&status=init&vmfile=no&moduleCall=webInfo&publishConfFile=webInfoPerson&publishSubDir=personal&keep=y&personal.pid=46412) |
|  | 4 | 20 121 80007until sommer term 2011**16** 121 80007since winter term 11/12 | Praktikum der Medizinischen Mikrobiologie für Pharmazeuten / Practical course of medical microbiology for Pharmacists | Various kinds of bacteria are studied more closely under the microscope and Gram stains performed. Optionally, a blood sample may be taken and the student's own blood group determined as well as the tetanus and German measles titre values. During a longer period, a sample colony of bacteria taken by students from the floor or from a non-disinfected hand is bred on a agar dish. The same is done with a throat swab. | 3 h / 42 h | Praktikum / Lab | 3 | - | 16 121 80006 | - | [Cherkasov](https://qis.verwaltung.uni-marburg.de/qisserver/rds?state=verpublish&status=init&vmfile=no&moduleCall=webInfo&publishConfFile=webInfoPerson&publishSubDir=personal&keep=y&personal.pid=46412) |
|  | 4 | 16 125 10100  | Stereochemie / Stereochemistry | Important and indispensable molecules such as carbohydrates and enzymes can possess various spatial orientations. These can have a dicisive effect on the whole circulation throughout the body. Using modern computer presentations, the diversity of these structures is presented and the students' attention is drawn to the fact that it is of evident importance to recognise exactly these structures because otherwise a poison may be made from a medication, such as , for example, the active agent thalidomide. Various methodologies for the separation and recognition of two different isomers are treated and the spatial powers of imagination sharpened. Furthermore, the “key and lock” principle as in the effect of, for example, enzymes and substrates, is mentioned.  | 1 h / 14 h | Seminar | 1 | Klausur / Written exam | - | Stereochemie | Klebe |
|  | 4 | 16 125 10090 | Einführung in die Instrumentelle Analyse / Introduction into instrumental analyses | These lectures do not only give the theoretical background information to the above mentioned laboratory work (number 28 on this list) but also draw a line to other more complex instrumental analysis methods, for example mass spectrometry and nuclear magnetic resonance spectroscopy. These lectures also go into further detail in the topic of electro-chemistry, for example conductometry and polarography are considered. Furthermore, the lectures deal with the wide range of chromatography and the common use of it in industry as well as in pharmacies open to the to public, because the instrumental analyses play a major role in the Pharmacopoeia Europa. In this course the necessity of correctly prepared and accomplished experiments in order to fulfill a proper validation is demonstrated. | 4h / 50h | Vorlesung / lecture | 4 | Nach Bestehen des Praktikums: Klasur / After passing the pracical course: written exam | 16 125 10110  | Instrumentelle Analytik | Keusgen |
|  | 4 | 16 125 30035  | Grundlagen der Ernährungslehre / Introduction to nutrition science  | The lecture introduces the most important food ingredients (carbohydrates, fats, proteins, water, vitamins and minerals). Their occurrence in foodstuff, their digestion and absorption as well as diseases resulting from malnutrition are discussed. | 1 h / 14 h | Vorlesung / Lecture | 1 | - | - | - | Petersen |
|  | 4 | 16 125 30060  | Pharmazeutische Biologie II (makro- und mikroskopische Analyse pflanzlicher Drogen und Analyse von Teedrogenmischungen) / Pharmaceutical Biology II(macro- and microscopic analysis of herb drugs and analysis of tea mixtures) | In the [scheduled](http://www.dict.cc/englisch-deutsch/scheduled.html) course days, approximate 80 herbal drugs are chosen and investigated. They are classified by indications for illnesses that can be treated phytotherapeutically, e.g. coughing, gastro-intestinal disorders and urinary complaints as well as cardiac and circulation problems. Every course day starts with a short introduction for respective herbal drugs including their macro- and microscopic features, chemical constituents and therapeutic indications. Application forms and duration of administration will also be mentioned. After the theoretical introduction, single herbal drugs are analysed by their macro- and microscopic features. In addition, mixtures consisting of five herbal drugs are investigated by macro- and microscopic analysis. The roles of the individual drugs in the mixtures will be discussed. | 3 h / 42 h | Praktikum / Lab | 3 | Klausur / Written exam | - | Pharmazeutische Biologie II: Pflanzliche Drogen | Li |
|  | 5 | 16 125 10160 | Arzneistoffanalytik unter besonderer Berücksichtigung der Arzneibücher (Qualitätssicherung und Kontrolle bei Arzneistoffen)/ Pharmaceutical Chemistry II(methods of analysis according to the European pharmacopoeia) | Within the framework of the laboratory practice, the students have to determine whether an active ingredient fulfils the requirements of the European Pharmacopoeia, mainly using various wet chemical methods. Furthermore, the students have to validate an analytical procedure according to the ICH guidelines.This course can be regarded as a continuation of the instrumental analysis course in the fourth semester, in which also methods of analysis according to the pharmacopoeia are discussed and practised. The difference is evident in the use of methods. In the fourth semester, the focus is on the instrumental analysis whereas now the student performs wet chemical analysis. | 8 h/ 112 h | Praktikum / Lab | 8 | Kolloquium und Klausur / Oral and written exam | 16 125 10145 | -Hier gibt es doch einen Schein„Arzneistoffanalytik unter besonderer Berücksichtigung der Arzneibücher (Qualitätssicherung und Kontrolle bei Arzneistoffen) entsprechend Normen für Medizinprodukte“ | Diederich |
|  | 5 | 16 125 10145 | Arzneistoffanalytik unter besonderer Berücksichtigung der Arzneibücher (Qualitätssicherung und Kontrolle bei Arzneistoffen) (Einführung)/ Pharmaceutical Chemistry II(methods of analysis according to the European pharmacopoeia) (Introduction) | These lectures do not only provide the theoretical background information to the above mentioned laboratory but also introduces the students to scientific literature search. Commonly used databases such as Medline, SciFinder, the protein data base, Reaxys, and the visualisation program Pymol are presented. The course also offers a first insight into the legal regulation of the drug market, such as e.g. the German Medicine act. | 3 h / 39 h | Seminar | 3 | - | 16 125 10160 | Certificate only available in combination with 16 125 10160 | Diederich |
|  | 5 | 16 125 30090 | Biogene Arzneimittel (Phytopharmaka, Antibiotika, gentechnisch hergestellte Arzneimittel) / Drugs with natural origin (herbal drugs, antiinfectives, drugs produced by methods of gene technology) | This is the first part of the seminar drugs with natural origin. The seminars will be presented by student groups. The contents of the seminars include basic [knowledge](http://www.dict.cc/englisch-deutsch/knowledge.html) of antiinfectives including antibiotics, antifungal and antimalarial agents. The chemical structures, biosynthesis, production, indications of the clinically used important antiinfectives will be treated in the seminars.  | 1 h / 14 h | Seminar | 1 | - | - | Pharmazeutische Biologie III (Biologische und phytochemische Untersuchungen)Biogene Arzneimittel (Antiinfektiva, Gentechnisch hergestellte Arzneimittel, Phytopharmaka) | Li |
|  | 5 | 16 125 40055 | Krankheitslehre / Pathology for pharmacists | Guest lecturers (clinicians and general practitioners) discuss frequent disorders and illnesses useful for daily practice in the pharmacy. They report on symptoms, clinical pathways and evidence based therapies e.g. of diabetes, mental disorders or cardiovascular diseases | 2 h / 28 h | Lecture | 2 | - | 16 125 40131 | Klinische Pharmazie | Becker |
|  | 6 | 16 125 30120  | Pharmazeutische Biologie III (Biologische und phytochemische Untersuchungen / Pharmaceutical Biology III(Biological and phytochemical investigations | In a block course, approximate 40 herbal drugs are planned for investigation. They contain constituents of about 13 natural product groups. Every course day starts with a short lecture presented by students. The lectures are referred to selected substance groups with focus on their chemical structures, biosynthesis, occurrence in herbal drugs and mode of action as well as their use in the phytotherapy. The indications of the selected substances are the respiratory tract, the digestive tract, the urinary tract, and the blood vessel system as well as the heart. Practical parts after the short lecture are to identify and distinguish herbal drugs by chemical analysis of the metabolite pattern, quantification of the effective constituents. | 6 h / 84 h | Praktikum / Lab | 6 | Klausur / Written exam | 16 125 30100 | Pharmazeutische Biologie III (Biologische und phytochemische Untersuchungen)Biogene Arzneimittel (Antiinfektiva, Gentechnisch hergestellte Arzneimittel, Phytopharmaka) | Li |
|  | 6 | 16 125 10220 | Biochemische Untersuchungsmethoden einschl. klin. Chemie / Methods of biochemical analysis(including clinical chemistry) | Biochemical analysis methods including clinical chemistry; Protein concentration determination, SDS-PAGE, Western Blot, Urine and blood analysis, Hemoglobin/gel filtration, Proteases, Xanthinoxidase, Enzyme kinetics, Isoenzymes, PCR, Bioinformatics | 7 h / 98 h | Vorlesung / Lecture | 7 | Klausur / Written Exam | 16 125 1020016 125 10210 | Biochemische Untersuchungsmethoden einschließlich klinischer Chemie | Hartmann, Grünweller |
|  | 6 | 16 125 10200 | Biochemie und Molekularbiologie/ Biochemistry and molecular biology | Organisms, Biomolecules, Water as biomolecule, Amino acids, Proteins, Enzymes, Enzyme kinetics, Carbohydrate metabolism (pathways, regulation and signal transduction), Lipid metabolism (Lipid classes and structures, biological membranes, fatty acid oxidation and synthesis, isoprene derivatives and cholesterol), Amino acid and nucleotide metabolism, RNA/DNA, Helix structures, Hyperchromicity, Intercalation, DNA supercoiling, Topoisomerases, Histones, Histone modification, DNA packaging, Protamine, DNA replication, Telomerase, DNA damage and repair, DNA recombination, Transposition, Genome structure, Repetitive elements, Genetic Fingerprint, DNA methylation, Protein biosynthesis and antibiotics, Transcription, RNA processing, splicing and editing, RNA interference, Nuclear transport of RNA, RNA decay | 3 h / 36 h  | Vorlesung / Lecture | 2 | Klausur / Written Exam | 16 125 10220 | Biochemische Untersuchungsmethoden einschließlich klinischer Chemie | Hartmann, Grünweller |
|  | 6 | 16 125 20050 | Biopharmazie einschließlich arzeniformen bezogener Pharmakokinetik / Biopharmacy and pharmaco-kinetics | This introduces the principles of general and special pharmacokinetics and respiration barriers. Part of the course is a 3 days “hands-on” computer workshop looking at pharmacological and bioequivalence computations.  | 7 h / 98 h | Praktikum / Lab | 7 | - | 16 125 20050 | Biopharmazie einschließlich arzneiformbezogener Pharmakokinetik und Qualitätssicherung bei Herstellung und Prüfung von Arzneimitteln | Bakowsky |
|  | 6 | 16 125 10210 | Grundlagen der Klinischen Chemie und Pathobiochemie / Introduction into clinical chemistry and patho-biochemistr | Protein concentration determination, Measured clinical-chemical values, Biochemical separation techniques, Immunochemical analysis techniques, Blood analysis, Diagnostic marker enzymes, DNA analysis, Blood analysis in the pharmacy | 2 h / 28 h | Vorlesung / Lecture | 2 | Klausur / Written Exam | 16 125 10220 | Biochemische Untersuchungsmethoden einschließlich klinischer Chemie | Hartmann, Grünweller |
|  | 6 | 16 125 30100  | Biogene Arzeneimittel (Phytopharmaka, Antibiotika, gentechnisch hergestellte Arzneimittel) / Drugs with natural origin (herbal drugs, antiinfectives, drugs produced by methods of gene technology) | This is the second part of the seminar drugs with natural origin. The seminars will be presented by student groups. The contents of the seminars include basic [knowledge](http://www.dict.cc/englisch-deutsch/knowledge.html) of molecular biology and production of recombinant drugs by genetic manipulation. The nature, production and indications of the clinically used important recombinant drugs, e.g. insulin and analoga, antibodies, growth factors and antitumor agents will be treated in the seminars.  | 1 h / 14 h | Seminar | 1 | - | 16 125 30120 | Pharmazeutische Biologie III (Biologische und phytochemische Untersuchungen)Biogene Arzneimittel (Antiinfektiva, Gentechnisch hergestellte Arzneimittel, Phytopharmaka) | Li |
|  | 6 | 16 125 20040 | Pharmazeutische Technologie einschließlich Medizinprodukte / Pharmaceutical Technology and Medicinal Products II  | Acquisition of expertise in the fields of classical and modern dosage forms, particularly themanufacture, testing and assessment, evaluation and properties of excipients andadditives, incompatibilities, stabilities of medicines and the essential foundations ofhomoeopathic pharmaceuticals, medical devices, sera and vaccines. | 4 h/ 14 h | Vorlesung / Lecture | 3 | - | - | - | Bakowsky |
|  | 7 | 16 125 20080  | Pharmazeutische Technologie (Arzneiformenlehre II) / Pharmaceutical Technology (II) | In these practical laboratory exercises, students work in teams. On the basis of the lectures which introduce the students to technical production methods in the pharmaceutical industry, various dosage forms are recreated and declared in accordance with industrial standards. Dosage forms include suppositories, dilutions, ointments and capsules. | 14 h / 196 h | Praktikum / Lab | 14 | Klausur / Written Exam | 1612520040 | Pharmazeutische Technologie | Bakowsky/Schäfer |
|  | 7 | 16 125 20060  | Qualitätssicherung bei Herstellung und Prüfung von Arzneimitteln / Quality management in the production and control of drugs | This course clarifies the GMP guidelines as well as production practices in industry and the pharmacy. You learn how to best ensure the hygienic standards exigencies set on a medicinal product in industry as well as in a pharmacy. | 2 h/ 28 h | Seminar | 2 | - | - | Biopharmazie einschließlich arzneiformbezogener Pharmakokinetik und Qualitätssicherung bei Herstellung und Prüfung von Arzneimitteln | Bakowsky /Schäfer |
|  | 7 | 16 125 20050 | Biopharmazie einschließlich arzeniformen bezogener Pharmakokinetik / Biopharmacy and pharmaco-kinetics | This introduces the principles of general and special pharmacokinetics and respiration barriers. Part of the course is a 3 days “hands-on” computer workshop looking at pharmacological and bioequivalence computations | 2 h/ 28 h | Praktikum / Lab | 2 | Praktische Übung / Practical Exercise | - | Biopharmazie einschließlich arzneiformbezogener Pharmakokinetik und Qualitätssicherung bei Herstellung und Prüfung von Arzneimitteln | Bakowswky/Schäfer |
|  | 7 | 16 125 40130  | Klinische Pharmazie I / Clinical Pharmacy I | This course covers a variety of topics of Clinical Pharmacy and Clinical Pharmacology: Problem oriented learning: Patient cases and in particular cases of multimorbidity are presented and discussed in order to identify and solve pharmaceutical problems, to demonstrate side effects and interaction potential of various pharmaceuticals. Pharmaceutical care: Everyday consulting in the pharmacy and clinic. Includes the option of touring a ward in the Fulda clinic (Klinikum Fulda).Special pharmacokinetics and dosage individualization. Design and assessment of clinical studies | 3 h / 42 h | Seminar | 3 | - | Teil der Klinischen Pharmazie I + II / Part of Clinical Pharmacy I + II 16 125 40130 + 16 125 40131 | - | Culmsee |
|  | 7 | 16 125 40090  | Pharmakotherapie (einschließlich Übungen) / Pharmacotherapy (including exercises) | This seminar discusses the therapy concepts and available drugs for the treatment of major diseases, e.g. diabetes, hypertension, hyperthyroidism, psychiatric diseases, epilepsy etc. Treatment guidelines are presented for the most common diseases that are highly relevant in the daily routine in the pharmacy.Exercises include case studies presenting prescriptions for common diseases where knowledge on therapy guidelines is required to identify pharmaceutical problems and drug interactions. | 2 h / 28 h | Seminar |  2  | Written exam | - | - | Culmsee |
|  | 7 | 16 125 30110  | Biogene Arzneimittel: Phytopharmaka / Biogenic drugs: herbal medicinal products | Important herbal medicinal products on the market are introduced in students’ presentations. | 1 h / 14 h | Seminar | 1 | Mündliche Präsentation / oral presentation | - | Praktikum: Pharmazeutische Biologie III – Biologische und phytochemische UntersuchungenSeminar: Biogene ~~16 125 40070~~Arzneimittel – Antiinfektiva, gentechnisch hergestellte Arzneimittel, Phytopharmakades Stoffgebiets G Biogene Arzneistoffe | Petersen |
|  | 7 | 16 125 20040  | Pharmazeutische Technologie einschließlich Medizinprodukte / Pharmaceutical Technology and Medicinal Products I  | Acquisition of expertise in the fields of classical and modern dosage forms, particularly themanufacture, testing and assessment, evaluation and properties of excipients andadditives, incompatibilities, stabilities of medicines and the essential foundations ofhomoeopathic pharmaceuticals, medical devices, sera and vaccines. | 4 h/ 14 h | Vorlesung / Lecture | 3 | - | - | - | Bakowsky / Schäfer |
|  | 8 | 16 125 10170  | Arzneimittelanalytik (Drugmonitoring, toxikologische und umweltrelevante Untersuchungen) / Drug analysis, drug monitoring, toxicological and environmental analysis | This course is divided into a theoretical and a practical part.The students are introduced to the fundamental basics of metabolism, structure-activity-relationships (QSAR), ADME, and pro drugs as well as biotransformation and stability of drugs. Students perform qualitative and quantitative analysis of drugs. Stability testing of APIs as well as the examination of potentially counterfeit drugs is also offered. | 9 h / 126 h | Praktikum / Lab | 9 | Klausur / Written exam | - | Arzneimittelanalytik (Drugmonitoring, toxikologische und umweltrelevante Untersuchungen) | DiederichKlebeSchlitzer |
|  | 8 | 16 125 40120  | Pharmakologischer-toxikolo-gischer Demonstrationskurs / Pharmacology and ToxicologyDemonstrations | Experimental demonstrations and presentations dealing with the effects of pharmaceuticals are introduced, discussed and critically assessed.  | 8 h / 88 h | Praktikumn (Demonstration) / Lab (Demonstration) | 8 | Klausur / Written exam | - | Pharmakologisch-toxikologischer Demonstrationskurs | Bünemann, Krasel |
|  | 8 | 16 125 40131  | Klinische Pharmazie II / Clinical Pharmacy II | This course covers a variety of topics of Clinical Pharmacy and Clinical Pharmacology: Problem oriented learning: Patient cases and in particular cases of multimorbidity are presented and discussed in order to identify and solve pharmaceutical problems, to demonstrate side effects and interaction potential of various pharmaceuticals. Pharmaceutical care: Everyday consulting in the pharmacy and clinic. . Includes the option of touring a ward of the Fulda clinic (Klinikum Fulda). Special pharmacokinetics and dosage individualization. Design and assessment of clinical studies  | 3 h / 42 h | Seminar | 3 | Klausur / Written exam | Teil der Klinischen Pharmazie I + II / Part of Clinical Pharmacy I + II 16 125 40130 + 16 125 40131 | Klinische Pharmazie | Culmsee |
|  | 8 | 16 125 50225  | Spezielle Rechtsgebeite für Apotheker (nur im SoSe)/ Law for pharmacists (only in summer term) | These specialist areas include the requirements for the approval of drugs, drug registration and administration laws, and GMPfundamentals (this latter is relevant for and close to industry) | 1 h / 14 h | Vorlesung / Lecture | 1 | - | - | - | Friedrich/Binger |
|  | 8 | 16 125 10260 | Wahlpflichtfach – Pharmazeutische Chemie / Specialization of choice - Pharmaceutical Chemistry: Structural biology and active substance design | This specialization of choice offers the unique possibility within a 3 week lab-course during the semester holidays - to join a current working group at the University of Marburg. Depending on the student's personal major areas of interest, a working group is chosen that is currently operating in that area of research. The student is assigned to a postgraduate with whom the student then personally and practically collaborates and supports. | 37.5 h / 112 h | Labor (Bibliothek) / Lab (Library) | 8 | - | - | - | Klebe |
|  | 8 | 16 125 10225  | Wahlpflichtfach – Pharmazeutische Chemie / Specialization of choice - Pharmaceutical Chemistry: Structure-based design and synthesis of enzyme inhibitors | This specialization of choice offers the unique possibility within a 3 week lab-course during the semester holidays - to join a current working group at the University of Marburg. Depending on the student's personal major areas of interest, a working group is chosen that is currently operating in that area of research. The student is assigned to a postgraduate with whom the student then personally and practically collaborates and supports. | 37.5 h / 112 h | Labor (Bibliothek) / Lab (Library) | 8 | - | - | Wahlpflichtfach Medizinische Chemie - Wirkstoffsynthese | Diederich |
|  | 8 | 16 125 10235  | Wahlpflichtfach – Pharmazeutische Chemie / Specialization of choice - Pharmaceutical Chemistry: Synthesis and characterization of active substances | This specialization of choice offers the unique possibility within a 3 week lab-course during the semester holidays - to join a current working group at the University of Marburg. Depending on the student's personal major areas of interest, a working group is chosen that is currently operating in that area of research. The student is assigned to a postgraduate with whom the student then personally and practically collaborates and supports. The Steinmetzer-group is mainly dealing with the structure based design and synthesis of new protease inhibitors, including their analytical and enzyme kinetic characterization.  | 37.5 h / 112 h | Labor (Bibliothek) / Lab (Library) | 8 | - | - | - | Steinmetzer |
|  | 8 | 16 125 10250  | Wahlpflichtfach – Pharmazeutische Chemie / Specialization of choice - Pharmaceutical Chemistry: Bioanalytic | This specialization of choice offers the unique possibility within a 3 week lab-course during the semester holidays - to join a current working group at the University of Marburg. Depending on the student's personal major areas of interest, a working group is chosen that is currently operating in that area of research. The student is assigned to a postgraduate with whom the student then personally and practically collaborates and supports.  | 37.5 h / 112 h | Labor (Bibliothek) / Lab (Library) | 8 | - | - | - | Keusgen |
|  | 8 | 16 125 10240 | Wahlpflichtfach – Pharmazeutische Chemie / Specialization of choice - Pharmaceutical Chemistry: Molecular Biology | Recombinant expression, Partial purification and activity measurements of enzymes acting on DNA and RNA (e.g. T7 RNA polymerase, Taq and Pfu DNA polymerases) | 37.5 h / 112 h | Labor (Bibliothek) / Lab (Library) | 8 | Teilnahme und Protokoll / participation and protocol | - | Isolierung und Charakterisierung rekombinanter RNA- und DNA-Polymerasen | Hartmann |
|  | 8 | 16 125 10230  | Wahlpflichtfach – Pharmazeutische Chemie / Specialization of choice - Pharmaceutical Chemistry:Active substance design - synthesis, optimization and drug and active substance information | This specialization of choice offers the unique possibility within a 3 week lab-course during the semester holidays - to join a current working group at the University of Marburg. Depending on the student's personal major areas of interest, a working group is chosen that is currently operating in that area of research. The student is assigned to a postgraduate with whom the student then personally and practically collaborates and supports. | 37.5 h / 112 h | Labor (Bibliothek) / Lab (Library) | 8 | - | - | - | Schlitzer |
|  | 8 | 16 125 30130  | Wahlpflichtfach – Pharmazeutische Biologie / Specialization of choice - Pharmaceutical Biology:Biochemistry and molecular biology of the secondary fungal metabolism | This specialization of choice offers the unique possibility within a 3 week lab-course during the semester holidays - to join a current working group at the University of Marburg. Depending on the student's personal major areas of interest, a working group is chosen that is currently operating in that area of research. The student is assigned to a postgraduate with whom the student then personally and practically collaborates and supports. | 37.5 h / 112 h | Labor (Bibliothek) / Lab (Library) | 8 | - | - | - | Li |
|  | 8 | 16 125 30140  | Wahlpflicht­praktikum -Pharmazeuti­sche Biologie / Specialization of choice – Pharmaceutical biology: Compulsory optional lab work  | The students work in our current research in the field of biochemistry and molecular biology of plant secondary metabolism | 37.5 h / 112 h | Labor / Lab | 8 | Protokoll und mündliche Presentation / protocol and oral presentation | - | Biochemie und Molekularbiologie des pflanzlichen Sekundärstoff­wechsels des Wahlpflichtfaches der Pharmazeuti­schen Biologie des Stoffgebiets K Wahlpflichtfach | Petersen |
|  | 8 | 16 125 50030 | Wahlpflichtfach – Geschichte der Pharmazie / Specialization of choice - History of Pharmacy | This specialization of choice offers the unique possibility within the framework of a 2 week “hands-on” experience - that can well take place during the semester holidays - to join a current working group at the University of Marburg. Depending on the student's personal major areas of interest, a working group is chosen that is currently operating in that area of research. The student is assigned to a postgraduate with whom the student then personally and practically collaborates and who gives support. | 37.5 h / 112 h | Bibliothek der GeschPH / Lab (Library at the Institute for the History of Pharmacy) | 8 | - | - | Pharmazeutische Biographik / Historische Arzneipflanzenmonographien | Friedrich/Anagnostou |
|  | 8 | 16 125 20110  | Wahlpflichtfach – Pharmazeutische Technologie und Biopharmazie / Specialization of choice – Pharmaceutical technology and biopharmacy | This “specialization of choice” offers the unique possibility within the framework of a 2 week “hands-on” experience - that can well take place during the semester holidays - to join a current working group at the University of Marburg. Depending on the student's personal major areas of interest, a working group is chosen that is currently operating in that area of research. The student is assigned to a postgraduate with whom the student then personally and practically collaborates and supports.  | 37.5 h / 112 h | Labor (Bibliothek) / Lab (Library) | 8 | - | - | - | Bakowsky |
|  | 8 | 16 125 40150 | Wahlpflichtfach -Klinische Pharmazie/ Specialization of choice - Clinical Pharmacy :Neurodegenerative diseases | This “specialization of choice” offers the unique possibility within the framework of a 2 week “hands-on” experience - that can well take place during the semester holidays - to join a current working group at the University of Marburg. Depending on the student's personal major areas of interest, a working group is chosen that is currently operating in that area of research. The student is assigned to a postgraduate with whom the student then personally and practically collaborates and supports.  | 37.5 h / 112 h | Labor (Bibliothek) / Lab (Library) | 8 | - | - | - | Culmsee |
|  | 8 |  | Wahlpflichtfach - Pharmakologie / Specialization of choice -Pharmacology:G-Protein coupled receptor signalling | This “specialization of choice” offers the unique possibility within the framework of a 2 week “hands-on” experience - that can well take place during the semester holidays - to join a current working group at the University of Marburg. Depending on the student's personal major areas of interest, a working group is chosen that is currently operating in that area of research. The student is assigned to a postgraduate with whom the student then personally and practically collaborates and supports.  | 37.5 h / 112 h | Labor (Bibliothek) / Lab (Library) | 8 | - | - | - | Bünemann |
|  | 8 | 16 125 40141 | Wahlpflichtfach - Pharmakologie / Specialization of choice - Pharmacology :Cardiovascular pharmacology | This “specialization of choice” offers the unique possibility within the framework of a 2 week “hands-on” experience - that can well take place during the semester holidays - to join a current working group at the University of Marburg. Depending on the student's personal major areas of interest, a working group is chosen that is currently operating in that area of research. The student is assigned to a postgraduate with whom the student then personally and practically collaborates and supports.  | 37.5 h / 112 h | Labor (Bibliothek) / Lab (Library) | 8 | - | - | - | Kockskämper |

**Lecture Series 5.-7. Semester: For the actual number please have a look into the course overview** <https://qis.verwaltung.uni-marburg.de/qisserver/rds?state=wtree&search=1&category=veranstaltung.browse&navigationPosition=lectures%2Clectureindex&breadcrumb=lectureindex&topitem=lectures&subitem=lectureindex> 🡪 Choose ‘Department 16 – Pharmacy’ or ‘Fachbereich 16 Pharmazie’

| **Nr. / No.** | **Sem****ester** | **Kursnr. / Course number** | **Kursname / Course title (German title)**  | **Kursbeschreibung / Course description** | **h pro Wo./ Sem. /** **h per** **week/****semester** | **Kurstyp / Course type** | **ECTS / ECTS points** | **Prüfung (Klausur, Kolloquium…) / Examination (written exam, colloquium…)** | **Nummer d. zugehörigen Vorlesung/Praktikums (falls vorhanden)Number of associated lecture/practical course (if applicable)** | **Schein (nur bei Teilnahme am dazugehörigen Praktikum) / German title of the certificate awarded at the end of the course (only at participation in the associated practical course)** | **Verantwortlicher / Name of the person/people responsible for the course** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 5 - 7 | **Part I =** 16 125 30081**Part I**I = 16 125 30082**Part III** = 16 125 30083 | Pharmazeutische Biologie I: Arzneipflanzen / Pharmaceutical Biology I: Medicinal plants Pharmazeutische Biologie : Phytopharmaka und Antiinfektiva / Pharmaceutical Biology II: preparations from plants and antiinfectives from microorganisms and PlantsPharmazeutische Biologie III= Immunologie und Gentechnologie / Pharmaceutical Biology III= Immunology and Gene technology | The main focuses of the lecture are medicinal plants. In the first part, the chemical structures, detection reactions, biosynthesis as well as biological and pharmacological activities of the important plant metabolite groups will be discussed. In the second part, the details of important medicinal plants will be presented. This includes short description of the plant and drugs derived thereof, the main and effective constituents of the drugs and indications in the phytotherapyThe first part of the lecture deals with preparations from medicinal plants: the extraction procedures and quality controls, their use in the modern medicine for diverse indication fields.The focuses of the second parts are drugs from microorganisms and plants, which are used for treatment of infection diseases. They include antibiotics, antifungal and antimalarial agents. The chemical structures, technical production, mode of actions, biosynthesis and applications will be summarized. In addition, the resistance problem, mechanisms as well as prevention will also be discussedThe basic knowledge of immunology will be treated. This includes the immune system, immune cells, activation of T- and B-lymphocytes, antibody production and memory cells. The importance and principle of immunization with diverse vaccines as well as production and quality control of vaccines will also be discussed.The part of Gene technology deals with the new trends of pharmaceutical biology, i.e. production of recombinant drugs including insulin, growth factors, antibodies and cytokines. After introduction for basic knowledge and technology for protein production, the different classes of recombinant drugs for different indications with representatives will be discussed in the lecture | 3 h / 42 h | Vorlesung / Lecture | 3 for each part | - | - | - | Li |
|  | 5 -7 | Part A = 16 125 10191Part B = 16 125 10192Part C =16 125 10193 | Pharmazeutisch medizinische Chemie III Part A,B,C / Pharmaceutical medical ChemistryPart A,B,C | This part of the course discusses the molecular fundamentals on the interactions between ligands and pharmaceutical constituents (such as, for example, enzymes and receptors). It also looks thoroughly at the synthesis of pharmaceuticals and pharmaceutical analysis and the chemical properties of pharmaceuticals and their development in detail. | 3 h/ 42 h | Vorlesung / Lecture  | 3 for each part | - |  | - | Hartmann, Keusgen, Steinmetzer, **Klebe**, Schlitzer, Morck |
|  | 6-7 | **Part I** = 16 125 20041**Part II** =16 125 20042 | Pharmazeutische Technologie einschließlich Medizinprodukte / Pharmaceutical Technology and Medicinal Products I  | Acquisition of expertise in the fields of classical and modern dosage forms, particularly themanufacture, testing and assessment, evaluation and properties of excipients andadditives, incompatibilities, stabilities of medicines and the essential foundations ofhomoeopathic pharmaceuticals, medical devices, sera and vaccines | 4 h/ 54 h | Vorlesung / Lecture | 4 for each part | - | - | - | Bakowsky |
| General explanation: The **Lecture Series** below consists of **3 lectures**. Each lecture has 3 parts (I-III). **In every semester**, one part of each lecture is taught; Example: **winterterm 2011/2012**: **Pharmakologie und Toxikologie** (16 125 400**83**)**, part III, Pathophysiology and pathobiochemistry** ((16 125 400**73**) **part III,** Introduction in medicinal foundations (16 125 400**63**) **part III.** |
|  | 5-7 | **Part I =** 16 125 40081**Part I**I = 16 125 40082**Part III** = 16 125 40083: | **Pharmakologie und ToxikologieI-III /**Pharmacology and Toxicology I -III **combined with** Pathophysiologie und Phathobiochemie /Pathophysiology and patho-biochemistryPart I, II, IIIand Einführung in die medizinischen Grundlagen I - III / Introduction in medicinal foundations I-III I-III / | This lecture is distributed over three semesters and covers both the principles of pharmacology and toxicology as well as the pharma-cology and toxicology of various organ systems. The emphasis is on the foundations of disease treatment | 2 h / 28 h | Lecture series | 2 for each part | - | Teil der Ringvorlesung / Part of lecture-series16 125 4008216 125 4006216 125 40083 | - | Bünemann |
|  | 5-7 | **Part I =** 16 125 40071Part II = 16 125 40072Part III = 16 125 40073:Part I = …81Part II = …82Part III = …83 | **Pathophysiologie und Pathobiochemie** / Pathophysiology and patho-biochemistry**combined with** Pharmakologie und ToxikologieI-III /Pharmacology and Toxicology I-III and Einführung in die medizinischen Grundlagen I - III / Introduction in medicinal foundations I-III  | This lecture is distributed over three semesters and covers the foundations of pathophysiological and pathobiochemical changes in disease.  | 1 h / 14 h | Vorlesung / Lecture | 1 for each part | - | Teil der Ringvorlesung / Part of lecture-series16 125 4008116 125 4008216 125 40083 | - | Bünemann |
|  | 5-7 | Part I = 16 125 40061Part II = 16 125 40062Part III = 16 125 40063: | Einführung in die medizinischen Grundlagen I - III / Introduction in medicinal foundations I-III **combined with** Pharmakologie und ToxikologieI-III /Pharmacology and Toxicology I-III and Pathophysiologie und Pathobiochemie / Pathophysiology and patho-biochemistry | This lecture is distributed over three semesters and gives an introduction to the medicinal foundations  | 1 h / 14 h | Vorlesung / Lecture | 1 for each part | - | Teil der Ringvorlesung / Part of lecture-series16 125 4008116 125 4008216 125 40083and16 125 4007116 125 4007216 125 40073 | - | Bünemann |