THIRD YEAR

INTAKE 2007

ACADEMIC YEAR 2009/10
UNITCODE: PHR 3107*  UNIT TITLE: PHARMACY PRACTICE III

TYPE
Lectures, seminars, practicals and tutorials, placement

NUMBER OF ECTS CREDITS: 8

LEARNING OBJECTIVES
To provide students with examples of knowledge required to practice disease management. To reinforce amongst students an awareness that they are to become members of a prestigious profession and to develop further within them a professional attitude, a sense of responsibility and a comprehensive knowledge of the requirements for an efficient and accurate pharmaceutical service. Opportunities are given for the students to interact with patients, to assess and identify a problem and to give advice to patients. Practical experience in community pharmacy and in practical settings of pharmacy.

CONTENT
Designing and Recommending a Pharmacist’s Care Plan
Pharmacist Prescribing
Quality Standards in pharmacy practice
Cardiovascular Disorders:
  - Testing for Cardiovascular Disorders, Hypertension, Hyperlipidemia, Congestive Heart Failure, Ischaemic Heart Disease, Thrombosis
Dispensing Drugs acting on the Autonomic Nervous System:
  - Cholinergic Drugs & Cholinergic Blocking agents
  - Adrenergic and Adrenergic Blocking agents
Skin Disorders:
  - Allergy and drug-induced skin disease
  - Acne and Psoriasis
Histamine and Antihistamine drugs
Dementia and Alzheimer’s Disease
Psychiatric Disorders:
  - Schizophrenia, Mood disorders, Anxiety disorders, Sleep disorders, Obesity and Eating disorders
Obstetrics, Gynaecology and Genito-urinary Disorders:
  - Hormone Replacement Therapy, Menstrual disorders, Contraception and infertility problems, Drugs for genito-urinary disorders
Infectious diseases:
  - HIV, Hepatitis
Medication Errors
Pharmacy Practice Research: Observational Methods, Surveys, Questionnaire construction
Qualitative research, Secondary data analysis, Data preparation, Statistical methods, Practical experience in a community pharmacy and practical attachment
Participation at the yearly symposium.

ASSESSMENT
Assessment is aimed to evaluate students’ knowledge and understanding of topics that form the core of knowledge required for effective professional practice.

- Written test (Duration of 2 hours) 95%
  - 14 compulsory short questions (5 marks each)
  - 3 questions (10 marks each)
  - No marks will be allocated to partially correct answers.
  - Held at the end of the second semester.

- Log Book 5%. The marks obtained from all practical sessions presented will be considered for the assessment.
RESULT
Percentage mark and grade

LECTURERS/DEMONSTRATORS
Lilian M. Azzopardi (Co-ordinator)  Anthony Serracino Inglott
Michael Calleja Daniel Calleja
Conrad Buttigieg Scicluna

GENERAL BIBLIOGRAPHY FOR PHARMACY PRACTICE MODULE
- Medical Dictionary
- Monthly Index of Medical Specialties (MIMS) Haymarket Medical Ltd: London (latest edn)
- Code of Ethics, Pharmacy Board, Malta.
- ABPI: Data Sheet Compendium, Walker G. Datapharm Publication: UK (latest ed.)

READING LIST
- McKay, AB, Hepler, CD, Knapp, DA. How to evaluate progressive pharmaceutical services. 1987. Bethesda: ASHP.
- Koda-Kimble M.A, Young LY, Kradjan WA. Handbook of Applied Therapeutics. 2006. USA: Lippincott Williams & Wilkins

+ Refer to Guidelines for Community Pharmacy Practice

* Pre-requisites: PHR 1101 and PHR 2103.
UNITCODE: PHR 3108  UNIT TITLE: PHARMACOTHERAPEUTICS

TYPE
Lectures, practicals and seminars

NUMBER OF ECTS CREDITS: 4

LEARNING OBJECTIVES
To provide information on the aetiology, clinical signs and symptoms, investigations and principles of treatment of diseases important to pharmacists in their development of a patient-oriented practice. Particular emphasis is given to the selection of appropriate drug treatment regimens, a balance of benefits to risks for patients under treatment and patient monitoring. Problem solving is carried out using case studies.
To enable the student to extract relevant information from clinical case notes and to identify and discuss pharmaceutical care issues.

CONTENT
Clinical investigations:
- Renal function tests, liver function tests, blood tests
- Serum electrolytes, acid base balance, cardiac enzymes, electrocardiograms
Therapeutic principles of selected disease states:
- Respiratory disorders: asthma, chronic obstructive airways disease
- Cardiovascular disorders: hypertension, angina, myocardial infarction, cardiac failure, atrial fibrillation, stroke
- GI disorders: peptic ulceration, Crohn's disease, ulcerative colitis
Clinical case studies on the ward:
- Understanding case notes, medical terminology, medical abbreviations, patient profiling, case presentation format
- Familiarization with clinical case notes of a selected patient and compilation of patient profile
- Interaction with multidisciplinary health care team and patients during ward round
- Oral presentation of clinical case study

ASSESSMENT
- Written test of 2 hours: 80%
- Case presentation: 20%

RESULT
Percentage mark and grade

LECTURERS/Demonstrators
Lilian M. Azzopardi (Co-ordinator)    Anthony Serracino Inglott
Marise Gauci    Lilian Wismayer
Angela Borg Barthet    Aaron Camilleri
Ann Camilleri    Simone Caruana
Angelo Psaila    Elaine Vella
Emma Marduca    Kristen Buhagiar
Ian Mifsud

READING LIST
Young LY, Koda-Kimble MA. Handbook of applied therapeutics. Lippincott Williams & Wilkins.


Koda-Kimble M.A, Young LY, Kradjan WA. Handbook of Applied Therapeutics. 2006. USA: Lippincott Williams & Wilkins
UNIT CODE: PHR 3115*  
UNIT TITLE: PHARMACY PRACTICE PROJECT II

TYPE  
Project

NUMBER OF ECTS CREDITS: 6

LEARNING OBJECTIVES  
This unit introduces the student to research methodology, applying the knowledge from previous units with special reference to planning, selection of data and following a protocol

CONTENT  
Protocol feasibility, discussion and approval
Starting of field work

ASSESSMENT  
- Protocol 50%
- Poster presentation 30%
- Participation at project presentations 20%

RESULT  
Percentage mark and grade

LECTURERS  
Anthony Serracino Inglott (Co-ordinator)
Lilian M. Azzopardi
Maurice Zarb Adami
Claire Shoemake

READING LIST  

* Pre-requisite: PHR 2018.
UNITCODE: PHR 3205*  UNIT TITLE: PHARMACEUTICAL ANALYSIS AND MEDICINAL CHEMISTRY II

TYPE
Lectures and seminars

NUMBER OF ECTS CREDITS: 6

LEARNING OBJECTIVES
To review legislative aspects behind the running of analytical laboratories.
To introduce further principles applied to drug design in various drug classes.

CONTENT
This Unit will deal with the Medicinal Chemistry (including the Structure – Activity relationships (SAR) of:
- Tricyclic and related psychotherapeutic drugs; atypical antipsychotics; pro-drug approach to depot antipsychotics.
- Monoamine Oxidase Inhibitors (MAOIs) and reversible MAOIs; Selective Serotonin reuptake inhibitors (SSRIs) and other antidepressants.
- Benzodiazepines and the first benzodiazepine competitive antagonist. Buspirone, zolpidem.
- Antibacterial drugs including tetracyclines, aminoglycosides, macrolides, sulphonamides, quinolones
- Drugs acting on the cardiovascular system
- Drugs acting on the endocrine system
- Steroids including cutaneous applications

ASSESSMENT
☐ Written test of 3 hours: 95%
☐ Assignment: 5%

RESULT
Percentage mark and grade

LECTURERS
Claire Shoemake (Co-ordinator)
Mary Ann Sant-Fournier

READING LIST
☐ Publications of the Pharmaceutical Inspection Convention (PIC). EFTA, Switzerland
☐ Publications of the Commission of the European Communities. Luxembourg
☐ The Pharmaceutical Codex (incorporating The British Pharmaceutical Codex),


* Pre-requisites: PHR 2203 and PHR 2026.
UNIT CODE:  PHR 3307*  UNIT TITLE:  PHARMACEUTICAL FORMULATIONS

TYPE
Lectures and practicals

NUMBER OF ECTS CREDITS: 4

LEARNING OBJECTIVES
To expose the student to the various aspects which have to be considered when formulating preparations for use as medicines, how these aspects of formulation are influenced by the proposed route of administration, as well as how these same aspects effect the therapeutic profile of the drugs in use.
To expose the student to the hands on application of principles of pharmaceutical formulation.
To consider special features of controlled release dosage forms and factors influencing their formulation.

CONTENT
Sterilised products
Total parenteral nutrition
Sterilisation processes and methods
Controlled release dosage forms
Relevant calculations

Demonstration of hands-on application of principles underlying bulk properties of powders, dry granulation and angle of repose, flow factor, grinding and sieving, microscopical methods and the Andreason pipette method to determine particle size.

ASSESSMENT
☐ Written test of 1.5 hours  75 %
☐ Practicals  25 %

RESULT
Percentage mark and grade

LECTURER/Demonstrators
Maurice Zarb Adami (Co-Ordinator)
Clarissa Captur
Renata Cutajar
Mark Mercieca

READING LIST

*Pre-requisites: PHR 1301 and PHR 2304
UNIT CODE: CPH 3011*  UNIT TITLE: PHARMACOLOGY D

TYPE
Lectures and seminars

NUMBER OF ECTS CREDITS: 4

LEARNING OBJECTIVES
i. to understand the basic pharmacology and mode of action of drugs used in immunopharmacology, oncology and hormones
ii. to present an overview of the molecular pharmacology of specific drugs, and to discuss the molecular-based research methodology and tools.

CONTENT
Cell differentiation and Antigen presenting cells
Immune defence mechanisms: T cells and B cells
Cytokines and Methods of immunosuppression
Basic principles of chemotherapy and drugs used in oncology
Oral and injectable hypoglycaemic agents
Thyroid hormones
Male and female sex hormones, contraceptives, HRT
Vitamin D and parathyroid hormone and Calcitonin
Recombinant drugs and Gene therapy
Bioinformatics, online databases, data mining
Specific receptor subtypes e.g. opioid receptors, histamine receptors, insulin receptor, cytokine receptors
Molecular modes of action of enzyme modifiers e.g. COX-inhibitors, cholinesterase inhibitors
Molecular aspects of discovery of novel drugs and drug targets: The Human Genome database
Research tools for studying pharmacological actions and pathways: overview of laboratory tools including PCR, electrophoresis, sequencing, genotyping, molecular cloning, cell culturing, transfections, expression analysis, microarray technology, transgenic animals

ASSESSMENT
Written test of 2 hours held at end of study unit.

RESULT
Percentage mark and grade

LECTURERS
Roger Ellul Micallef  Janet Mifsud
J J Borg  Anthony Fenech
Frederick Fenech  Mark Micallef

READING LIST
- Rowland and Tozer.  Clinical Pharmacokinetics: concepts and applications. Lippincott, Williams & Wilkins.

* Pre-requisites: CPH 2010, CPH 2011 and CPH 3010
UNIT CODE: PHR 3208
UNIT TITLE: PHARMACOGNOSY AND NATURAL PRODUCTS

TYPE
Lectures

NUMBER OF ECTS CREDITS: 4

LEARNING OBJECTIVES
To impart biological, biochemical and agronomic background information relating to natural drugs and to introduce the student to the locally available crude drugs.

CONTENT
An introduction to the history of the utilization of medicinal plants
The principles and applications of Ethnobotany and Ethnopharmacology
A comprehensive introduction to secondary metabolites mainly terpenoids, alkaloids flavonoids, tannins, coumarins, glycosides
In vitro and in vivo testing of secondary metabolites from Plants
Phytomedicines used in Modern Therapies
Alternative medicine: Herbal Medicine, Aromatherapy, Apitherapy and Homeopathy
Nutraceuticals
Legislation: Medicine or Food?
Poisonous Plants

ASSESSMENT
☐ Written test of 1 hour 60%
☐ Assignment 40%

RESULT
Percentage mark and grade

LECTURERS
Maurice Zarb Adami (Co-ordinator)
Everaldo Attard

READING LIST
☐ LECTURE NOTES: http://staff.um.edu.mt/eatt1/pharmacy.html
UNIT CODE: CHE 3141  UNIT TITLE: SEPARATION TECHNIQUES

TYPE
Lectures

NUMBER OF ECTS: 2

LEARNING OBJECTIVES
Identify traditional and modern methods of separation
Distinguish between techniques for analysis and preparation
Apply the techniques for qualitative and quantitative purposes
Be able to select the appropriate technique for specific pharmaceutical laboratory measurements

CONTENT
Gas Chromatography: Separation efficiency and resolution; Instrumentation Columns and stationary phases; Universal detectors; Applications.
Liquid Chromatography: Instrumentation; The mobile phase; Columns and stationary phases; Universal detectors; Applications.

ASSESSMENT
The mode of assessment for the unit was based on an open book session of written questions to be answered in an hour.

LECTURER
Claire Shoemake (Co-ordinator)
George Peplow

READING LIST (recommended)

Supplementary reading
- Analytical Chemistry by Douglas A Skoog and Donald M West. 6th Edn.
UNIT CODE: PAT 3322  UNIT TITLE: GENERAL AND PHARMACEUTICAL MICROBIOLOGY III

TYPE: Lectures
NUMBER OF ECTS: 4
PRE-REQUISITE General and Pharmaceutical Microbiology I and II
ASSESSMENT Written, at the end of the first semester
RESULT Percentage mark and grade

LECTURERS
Prof. Paul Cuschieri (PVC)
Dr. Christopher Barbara (CB)
Dr Michael A. Borg (MB)

Description
This study covers:
Immunisation (Bacterial Preparations) – Prof. Paul Cuschieri (PVC)
Immunisation (Viral Preparations) – Dr Christopher Barbara (CB)
Infection control – Dr Michael A. Borg (MB)

Lectures:
- Invasive pneumococcal disease and pneumococcal vaccines
- Typhoid and typhoid vaccines
- Meningococcal disease and meningococcal vaccines
- Invasive *Haemophilus influenzae* capsular type b infections and HIB vaccines
- Diphtheria and diphtheria toxoid preparations
- Tetanus and tetanus toxoid preparations
- Whooping cough and *Bordetella pertussis* vaccines
- The routine immunisation schedule
- Hepatitis A vaccine
- Hepatitis B vaccine
- Measles vaccines
- Mumps vaccines
- Rubella vaccines
- Principles of transmission of infectious diseases
- Infection control – methods and cost effectiveness
- Hand hygiene
- Multiresistant organisms and their control
- Prevention of multiresistance & judicious use of antibiotics in hospitals
- Prevention of travel associated infections

LEARNING OBJECTIVES
To continue to deal with systematic microbiology where the biological characteristics of the major genera and species are described, together with the clinical infections that these organisms cause.
To describe the theoretical and practical aspects of active and passive immunisation against infectious diseases. Particular attention will be paid to locally endemic infections and to vaccination programmes.
The basic principles of infection control in the hospital setting are also covered.
Reading List

Recommended Textbooks:

Medical Microbiology by David Greenwood et al; 17th Ed. 2007, ISBN04443102090, Churchill Livingstone

Lectures:

- Invasive pneumococcal disease and pneumococcal vaccines (2 lectures, PVC)
- Typhoid and typhoid vaccines (2 lectures, PVC)
- Meningococcal disease and meningococcal vaccines (2 lectures, PVC)
- Invasive *Haemophilus influenzae* capsular type b infections and HIB vaccines (1 lecture, PVC)
- Diptheria and diphtheria toxoid preparations (2 lectures, PVC)
- Tetanus and tetanus toxoid preparations (2 lectures, PVC)
- Whooping cough and *Bordetella pertussis* vaccines (2 lectures, PVC)
- The routine immunisation schedule (1 lecture, PVC)
- Hepatitis A vaccine (1 lecture, CB)
- Hepatitis B vaccine (1 lecture, CB)
- Measles vaccines (1 lecture, CB)
- Mumps vaccines (1 lecture, CB)
- Rubella vaccines (1 lecture, CB)
- Principles of transmission of infectious diseases (1 lecture, MA)
- Infection control – methods and cost effectiveness (1 lecture, MA)
- Hand hygiene (1 lecture, MA)
- Multiresistant organisms and their control (1 lecture, MA)
- Prevention of multiresistance & judicious use of antibiotics in hospitals (1 lecture, MA)
- Prevention of travel associated infections (1 lecture, MA)
UNIT CODE: CPH 3010*  UNIT TITLE: PHARMACOLOGY C

TYPE
Lectures and seminars

NUMBER OF ECTS: 4

LEARNING OBJECTIVES
I. To understand the disposition of drugs in the body and the effects of drug metabolising enzymes, and organ clearance mechanisms in PK/PD
II. To understand the basic pharmacology and mode of action of drugs used to treat neurological and respiratory disorders; pharmacology of steroids

CONTENT
Multi compartment models
Metabolism and biotransformation: Phase I and phase II reactions
Physiological models in pharmacokinetics: Hepatic and renal clearance
Pharmacokinetic principles in oral multiple dosage drug regimens
Infusion drug regimens pharmacokinetics
Basic principles in epilepsy and classification in epilepsy
Traditional antiepileptic drugs and new antiepileptic drugs
Pharmacokinetic principles in prescribing antiepileptic drugs
Drugs used in other chronic neurological and movement disorders;
Parkinson’s disease and Alzheimer’s disease
Drugs affecting the Nitric Oxide pathways
Inflammatory processes in asthma
Drugs used in asthma: beta-adrenergic receptor agonists, anticholinergic agents, methylxanthines, antileukotriene agents
Drugs used in allergies
Glucocorticoids: models of action at cellular level, regulation of synthesis, Structure activity relationships, adverse effects

ASSESSMENT
Written test of 2 hours held at end of study unit.

RESULT
Percentage mark and grade

LECTURERS
Roger Ellul-Micallef  Janet Mifsud
Anthony Fenech  Charles Scerri

READING LIST
- Laurence and Bennett. Clinical Pharmacology. Churchill Livingston
- Rowland and Tozer. Clinical Pharmacokinetics: concepts and applications. Lippincott, Williams & Wilkins.

* Pre-requisites: CPH 2010 and CPH 2011.
UNIT NO: PHR 3030  UNIT TITLE: TOTAL QUALITY SYSTEMS I

TYPE
Lectures

NUMBER OF ECTS: 2

LEARNING OBJECTIVES
To provide the student with the ability to formulate strategies for assessing the performance of processes and the conformance of food to specifications and legislation and to contribute directly to quality assurance to ensure that production of food conforms with legal requirements. On successful completion the student will be able to participate in the development and management of quality assurance systems in the food industry; assess the value of the various techniques used in quality assurance; participate in the application of total quality systems; and establish appropriate controls for assessing the conformance of products to specifications and the performance of production processes.

CONTENT

ASSESSMENT
□ Written test of 1 hour held at the end of the second semester

LECTURERS
Claire Shoemake (Co-ordinator)
Stephen Ferrito
UNIT CODE: PHR 3306*  UNIT TITLE: PHARMACEUTICS III

TYPE
Lectures, Tutorials

NUMBER OF ECTS CREDITS: 4

LEARNING OBJECTIVES
To describe tablet and capsule formulation and manufacturing processes needed to produce tablets and capsules of high standard in accordance with the specifications laid down by the BP, USP etc. Problems arising during manufacture and storage will be discussed.
To highlight value of the dissolution test as a method of tablet quality control, including the effect of various formulation and processing parameters on the dissolution of tablets. The students will learn the effect of various formulation and processing parameters on the dissolution of tablets. The unit will also introduce the student to the rationale behind pharmaceutical quality assurance.
To introduce Good Manufacturing Practice Principles.

CONTENT
Tablet and Capsule Manufacturing
Tablet formulation: diluents, adsorbants, binding agents, disintegrants, colouring and flavouring
Granulation: dry granulation, slugging, moist granulation, granule drying, lubricants and glidants
Tablet design: route of administration, dose uniformity, stability and storage, acceptability, excipients, interactions
Compressed tablets: types of tablets, manufacture of tablets - direct compression, problems associated with the manufacture of tablets, tablet strength, capping, prevention of capping, tablet standards - Pharmacopoeial considerations
Coating: reasons for coating tablets, sugar coating, problems of sugar coating, film coating, problems associated with film coating, fluid bed coating, sustained release coating, enteric coating
Capsules: raw material, hard gelatin capsules, soft gelatin capsules, advantages of soft gelatin capsules, formulation, bioavailability aspect, packaging techniques

Dissolution and Quality Control
Physical process of dissolution, Fick’s laws, mathematical description of dissolution, test parameters.
Effect of processing parameters (compression, mixing, coating) and formulation parameters (diluents, glidants, disintegrants) on tablet dissolution.

Introducing Good Manufacturing Practice: The importance of Quality Control and Quality assurance in the pharmaceutical industry. A site visit to a pharmaceutical company.

ASSESSMENT
Written test of 2 hours held at the end of the second semester.

RESULT
Percentage mark and grade

LECTURERS
Maurice Zarb-Adami (Co-ordinator)
Edwina Brejza
READING LIST


* Pre-requisites: PHR 1301 and PHR 2304.
UNIT CODE: PAT 3323  UNIT TITLE: ANTIMICROBIAL CHEMOTHERAPY I

TYPE Lectures

NUMBER OF ECTS CREDITS 4

PREREQUISITES PAT1322, PAT2322 and PAT3322

ASSESSMENT Written, at the end of the second semester

RESULT Percentage mark and grade

LECTURERS Prof. Paul Cuschieri (PVC) Coordinator
Dr Paul Caruana (PFC)

DESCRIPTION This study unit covers Antibiotics.

Lectures:

- Introduction: definitions; historical perspectives; properties of therapeutically useful antibiotics; classification of antibiotics
- Drug combinations, isobolograms
- Fusidanes
- Nitroimidazoles – metronidazole
- Sulphonamides and the diaminopyrimidines
- Aminoglycosides
- Lincosamides
- Macrolides
- Tetracyclines
- Chloramphenicol

LEARNING OBJECTIVES

These credits are intended to outline the properties of the major groups of antimicrobial agents on key drugs, discuss their indications, understand antibiotic selectivity by identifying enzymes, modes of action and apply the principles underlying their correct usage in treatment and prophylaxis.

READING LIST

Recommended Textbooks:

Medical Microbiology by David Greenwood et al; 17th Ed. 2007, ISBN04443102090, Churchill Livingstone

Goodman and Gillman's The Pharmacological Basis of Therapeutics

Lectures:

- Introduction: definitions; historical perspectives; the development of antibiotics; sources of naturally occurring compounds; the concept of selective toxicity; properties of therapeutically useful antibiotics; microbicidal and microbistatic effects; classification of antibiotics; competitive and non-competitive inhibition; lethal synthesis (2 lectures, PVC)
• Drug combinations, isobolograms (1 lecture, PVC)
• Fusidanes (1 lecture, PVC)
• Nitroimidazoles – metronidazole (2 lectures, PVC)
• Sulphonamides and the diaminopyrimidines (2 lectures, PVC)
• Aminoglycosides (3 lectures, PFC)
• Lincosamides (1 lecture, PFC)
• Macrolides (2 lectures, PFC)
• Tetracyclines (1 lecture, PFC)
• Chloramphenicol (1 lecture, PFC)
UNIT CODE: PHR3340
UNIT TITLE: PHARMACOECONOMICS AND MANAGEMENT IN PHARMACY

TYPE Lectures and Seminars

NUMBER OF ECTS CREDITS: 2

LEARNING OBJECTIVES
To obtain an appreciation of the impact of medication costs on the financial resources of the patient and of the country.

To understand the role of management in the efficient provision of pharmacy services, and the tools that can be used to achieve such efficiency.

CONTENT
The impact of disease on the patient, the family, society, the economy and the state.

Basic concepts of economics as applied to health in general and to pharmaceuticals in particular.

The major pharmacoeconomic tests that are available to determine the efficiency, utility of and benefits arising from the use of different medicines and how these can be minimised.

The requirement of regulation in pharmaceutical production, marketing and dispensing, and the effect that this has on the cost of therapy.

The pharmacoeconomic factors that need to be taken into account along with factors of other nature when establishing treatment protocols in particular circumstances.

Requirements for running efficient pharmacy services both in the community and in hospitals.

The link between medicines management and clinical governance, risk management, forming effective relationships between primary and secondary care and improving financial planning.

ASSESSMENT
Written test of two hours

RESULT
Percentage mark and grade

LECTURERS/DEMONSTRATORS
Maurice Zarb Adami, Lilian Wismayer, Pierre Fava

READING LIST