UNIVERSITY OF MALTA
FACULTY OF MEDICINE & SURGERY
DEPARTMENT OF PHARMACY

B. PHARM. (HONS)
PROGRAMME OF STUDIES
Intake 2009 - 2013
UNIVERSITY OF MALTA  
DEPARTMENT OF PHARMACY  
BPHARM (HONOURS) PROGRAMME OF STUDIES  
YEAR ONE – INTAKE 2009  

**Academic Year 2009 - 2010**  
*Year (These units are spread over Semester 1 and Semester 2)*

**Compulsory Units**  
(Student must register for all units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>ECTS</th>
<th>Compensatability</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHR 1101</td>
<td>Pharmacy Practice I</td>
<td>8</td>
<td>Non Compensatable</td>
</tr>
<tr>
<td>PHR 1013</td>
<td>Social Aspects of Pharmacy</td>
<td>2</td>
<td>Non Compensatable</td>
</tr>
<tr>
<td>PHR 1102</td>
<td>Pharmaceutical Chemistry</td>
<td>10</td>
<td>Non Compensatable</td>
</tr>
<tr>
<td>PHR 1301</td>
<td>Pharmaceuticals I</td>
<td>6</td>
<td>Non Compensatable</td>
</tr>
<tr>
<td>PHR 1500</td>
<td>Clinical Terminology</td>
<td>2</td>
<td>Non Compensatable</td>
</tr>
<tr>
<td>ANA 1003</td>
<td>Histology and Anatomy</td>
<td>4</td>
<td>Non Compensatable</td>
</tr>
<tr>
<td>MAT 1900</td>
<td>Elementary Calculus</td>
<td>4</td>
<td>Non Compensatable</td>
</tr>
<tr>
<td>PHB 1041</td>
<td>Physiology</td>
<td>4</td>
<td>Non Compensatable</td>
</tr>
<tr>
<td>PAT 1322</td>
<td>General and Pharmaceutical Microbiology 1</td>
<td>4</td>
<td>Non Compensatable</td>
</tr>
<tr>
<td>PHR1120</td>
<td>Pharmacy Special Topics I</td>
<td>2</td>
<td>Non Compensatable</td>
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</tbody>
</table>

Number of ECTS for Semester I and II: 46 ECTS

**Semester 1**

**Compulsory Units**  
(Student must register for all units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>ECTS</th>
<th>Compensatability</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHR 1202</td>
<td>Pharmaceutical Analysis &amp; Calculations</td>
<td>2</td>
<td>Non Compensatable</td>
</tr>
<tr>
<td>SOR 0210</td>
<td>Data Treatment and Probability</td>
<td>2</td>
<td>Non Compensatable</td>
</tr>
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Number of ECTS for Semester I: 4 ECTS

**Semester 2**

**Compulsory Units**  
(Student must register for all units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>ECTS</th>
<th>Compensatability</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHR 1026</td>
<td>Introduction to Medicinal Chemistry</td>
<td>2</td>
<td>Non Compensatable</td>
</tr>
<tr>
<td>CIS 1004</td>
<td>Computing for Chemists and Pharmacists</td>
<td>4</td>
<td>Non Compensatable</td>
</tr>
<tr>
<td><em>LIN 1081</em></td>
<td>It-Thaddim tal-Malti ghal-Ispiżjara</td>
<td>2</td>
<td>Compensatable</td>
</tr>
<tr>
<td>SOR 0220</td>
<td>Elementary Statistical Theory</td>
<td>2</td>
<td>Non Compensatable</td>
</tr>
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</table>

Number of ECTS for Semester II: 10 ECTS

Total ECTS required for Year I: 60 ECTS  
Requirement for regular progression to YEAR II: 60 ECTS

**N.B.**  * Those students who have not resided in Malta for 5 out of 10 years preceding the course may apply to the Head of Department who may accept 2 ECTS in another language instead of LIN 1081.
UNIVERSITY OF MALTA  
DEPARTMENT OF PHARMACY  

BPHARM (HONOURS) PROGRAMME OF STUDIES  
YEAR TWO – INTAKE 2009  

Academic Year 2010 - 2011  

Year (These units are spread over Semester 1 and Semester 2)

### Compulsory Units (Students must register for all units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>ECTS</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHR 2103</td>
<td>Pharmacy Practice II (pre-requisite PHR 1101)</td>
<td>8</td>
<td>Non Compensatable</td>
</tr>
<tr>
<td>PHR 2105</td>
<td>Aspects of Nutrition</td>
<td>2</td>
<td>Non Compensatable</td>
</tr>
<tr>
<td>PHR 2108</td>
<td>Regulatory Affairs and Pharmacy Ethics</td>
<td>2</td>
<td>Non Compensatable</td>
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<tr>
<td>PHR 2018</td>
<td>Pharmacy Practice Project I</td>
<td>2</td>
<td>Non Compensatable</td>
</tr>
<tr>
<td>PHR 2026</td>
<td>Medicinal Chemistry I (pre-requisite PHR 1026)</td>
<td>6</td>
<td>Non Compensatable</td>
</tr>
<tr>
<td>PHR 2304</td>
<td>Pharmaceutics II (pre-requisite PHR 1301)</td>
<td>6</td>
<td>Non Compensatable</td>
</tr>
<tr>
<td>PHB 2042</td>
<td>Biochemistry and Molecular Biology</td>
<td>4</td>
<td>Non Compensatable</td>
</tr>
<tr>
<td>PAT 2322</td>
<td>General and Pharmaceutical Microbiology II (pre-requisite PAT 1322)</td>
<td>4</td>
<td>Non Compensatable</td>
</tr>
<tr>
<td>PHR 2120</td>
<td>Pharmacy Special Topics II</td>
<td>2</td>
<td>Non Compensatable</td>
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Number of ECTS Semester I and II: **36 ECTS**

### Semester I

### Compulsory Units (Students must register for all units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>ECTS</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHR 2203</td>
<td>Pharmaceutical Analysis I</td>
<td>4</td>
<td>Non Compensatable</td>
</tr>
<tr>
<td>PHR 2036</td>
<td>Pharmaceutical Kinetics and Stability Testing</td>
<td>4</td>
<td>Non Compensatable</td>
</tr>
<tr>
<td>PAT 2121</td>
<td>Pathology</td>
<td>4</td>
<td>Non Compensatable</td>
</tr>
<tr>
<td>CPH 2010</td>
<td>Pharmacology A</td>
<td>6</td>
<td>Non Compensatable</td>
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Number of ECTS Semester I: **18 ECTS**

### Semester 2

### Compulsory Units (Students must register for all units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>ECTS</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPH 2011</td>
<td>Pharmacology B (pre-requisite CPH 2010)</td>
<td>4</td>
<td>Non Compensatable</td>
</tr>
<tr>
<td>SOR 0230</td>
<td>Statistical Analysis in Practice using SPSS (pre-requisites SOR 0210 and SOR 0220)</td>
<td>2</td>
<td>Non Compensatable</td>
</tr>
</tbody>
</table>

Number of ECTS Semester II: **6 ECTS**

Total ECTS required for Year II: **60 ECTS**

Requirement for regular progression to YEAR III: **60 credits**
**UNIVERSITY OF MALTA**  
**DEPARTMENT OF PHARMACY**  
**BPHARM (HONOURS) PROGRAMME OF STUDIES**  
**YEAR THREE – INTAKE 2009**

Academic Year 2011 - 2012  
*Year* (These units are spread over Semester 1 and Semester 2)

### Compulsory Units (Students must register for all units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>ECTS</th>
<th>Type</th>
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</thead>
<tbody>
<tr>
<td>PHR 3107</td>
<td>Pharmacy Practice III (pre-requisites PHR 1101 and PHR 2103)</td>
<td>8</td>
<td>Non Compensatable</td>
</tr>
<tr>
<td>PHR 3108</td>
<td>Pharmacotherapeutics</td>
<td>4</td>
<td>Non Compensatable</td>
</tr>
<tr>
<td>PHR 3115</td>
<td>Pharmacy Practice Project II (pre-requisite PHR 2018)</td>
<td>6</td>
<td>Non Compensatable</td>
</tr>
<tr>
<td>PHR 3205</td>
<td>Pharmaceutical Analysis &amp; Medicinal Chemistry II (pre-requisites PHR 2203 and PHR 2026)</td>
<td>6</td>
<td>Non Compensatable</td>
</tr>
<tr>
<td>PHR 3307</td>
<td>Pharmaceutical Formulations (pre-requisites PHR 1301 and PHR 2304)</td>
<td>4</td>
<td>Non Compensatable</td>
</tr>
<tr>
<td>CPH 3011</td>
<td>Pharmacology D (Pre-requisites CPH 2010, CPH 2011 and CPH 3010)</td>
<td>4</td>
<td>Non Compensatable</td>
</tr>
<tr>
<td>PHR 3208</td>
<td>Pharmacognosy and Natural Products</td>
<td>4</td>
<td>Non Compensatable</td>
</tr>
<tr>
<td>PHR 3340</td>
<td>Pharmacoeconomics and Management in Pharmacy</td>
<td>2</td>
<td>Non Compensatable</td>
</tr>
</tbody>
</table>

Number of ECTS for Semester I and II: 38 ECTS

#### Semester 1

### Compulsory Units (Students must register for all units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>ECTS</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHE 3141</td>
<td>Separation Techniques</td>
<td>2</td>
<td>Non Compensatable</td>
</tr>
<tr>
<td>PAT 3322</td>
<td>General and Pharmaceutical Microbiology III (pre-requisites PAT 1322 and PAT 2322)</td>
<td>4</td>
<td>Non Compensatable</td>
</tr>
<tr>
<td>CPH 3010</td>
<td>Pharmacology C (pre-requisites CPH 2010 and CPH 2011)</td>
<td>4</td>
<td>Non Compensatable</td>
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</table>

#### Recommended Optional Study Units

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>ECTS</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Extra Curricular</td>
<td>2</td>
<td></td>
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</table>

Number of ECTS for Semester I: 12 ECTS

#### Semester 2

### Compulsory Units (Students must register for all units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>ECTS</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHR 3030</td>
<td>Total Quality Systems I</td>
<td>2</td>
<td>Non Compensatable</td>
</tr>
<tr>
<td>PHR 3306</td>
<td>Pharmaceutics III (pre-requisites PHR 1301 and PHR 2304)</td>
<td>4</td>
<td>Non Compensatable</td>
</tr>
<tr>
<td>PAT 3323</td>
<td>Antimicrobial Chemotherapy I (Pre-requisites PAT 1322, PAT 2322, PAT 3322)</td>
<td>4</td>
<td>Non Compensatable</td>
</tr>
</tbody>
</table>

Number of ECTS for Semester II: 10 ECTS

Total ECTS required for Year III: 60 ECTS  
Requirement for Regular progression to YEAR IV: 60 ECTS

N.B * (Optional Study Units should be taken during first semester only)
### Academic Year 2012 - 2013

#### Year Four – Intake 2009

**UNIVERSITY OF MALTA**  
DEPARTMENT OF PHARMACY  
BPHARM (HONOURS) PROGRAMME OF STUDIES

<table>
<thead>
<tr>
<th>Year</th>
<th>Compulsory Unit</th>
<th>ECTS</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PHR 4120</td>
<td>Pharmacy Practice Project III (pre-requisites PHR 2018 and PHR 3115)</td>
<td>12 ECTS</td>
</tr>
</tbody>
</table>

**Number of ECTS for Semester I and II**  
12 ECTS

#### Semester 1

**Elective Units**  
(Students may Choose a study-unit to the value of **20 ECTS** from the following list)

<table>
<thead>
<tr>
<th>Unit</th>
<th>Course Title</th>
<th>ECTS</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHR 4401</td>
<td>Clinical Pharmacy</td>
<td>20 ECTS</td>
<td>Non compensatable</td>
</tr>
<tr>
<td>OR PHR 4402</td>
<td>Pharmaceutical Analysis</td>
<td>20 ECTS</td>
<td>Non compensatable</td>
</tr>
<tr>
<td>OR PHR 4404</td>
<td>Pharmacy Administration</td>
<td>20 ECTS</td>
<td>Non compensatable</td>
</tr>
<tr>
<td>OR PHR 4444</td>
<td>Hospital Pharmacy</td>
<td>20 ECTS</td>
<td>Non compensatable</td>
</tr>
<tr>
<td>OR PHR 4445</td>
<td>Clinical Analysis</td>
<td>20 ECTS</td>
<td>Non compensatable</td>
</tr>
<tr>
<td>OR PHR 4446</td>
<td>Industrial Pharmacy</td>
<td>20 ECTS</td>
<td>Non compensatable</td>
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</table>

**Number of ECTS for Semester I**  
20 ECTS

#### Semester 2

**Compulsory Units** (Students must register for all units)

<table>
<thead>
<tr>
<th>Unit</th>
<th>Course Title</th>
<th>ECTS</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHR 4112</td>
<td>Pharmacy Practice IV (pre-requisites PHR 1101, PHR 2103 and PHR 3107)</td>
<td>6 ECTS</td>
<td>Non compensatable</td>
</tr>
<tr>
<td>PHR 4308</td>
<td>Pharmaceutics IV (pre-requisites PHR 1301, PHR 2304, PHR 3306, PHR 3307, PAT 1322, PAT 2322, PAT 3323)</td>
<td>6 ECTS</td>
<td>Non compensatable</td>
</tr>
<tr>
<td>PHR 4211</td>
<td>Total Quality Systems II (pre-requisite PHR 3030)</td>
<td>2 ECTS</td>
<td>Non compensatable</td>
</tr>
<tr>
<td>PHR 4311</td>
<td>Medicinal Chemistry III (pre-requisites PHR 1026, PHR 2026, PHR 3205 and CHE 3141)</td>
<td>4 ECTS</td>
<td>Non compensatable</td>
</tr>
<tr>
<td>PHR 4110</td>
<td>The Pharmacist in Society (pre-requisites PHR 1013 and PHR 2108)</td>
<td>2 ECTS</td>
<td>Non compensatable</td>
</tr>
<tr>
<td>CPH 4020</td>
<td>Pharmacology G (pre-requisites CPH 2010, CPH 2011, CPH 3010 and CPH 3011)</td>
<td>8 ECTS</td>
<td>Non compensatable</td>
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</tbody>
</table>

**Number of ECTS for Semester II**  
28 ECTS

**Total ECTS required for Year IV:**  
60 ECTS

**Requirement for regular progression to YEAR IV:**  
60 ECTS
UNIVERSITY OF MALTA
DEPARTMENT OF PHARMACY

BPHARM (HONOURS) PROGRAMME OF STUDIES

YEAR FIVE – INTAKE 2009

Academic Year 2013 - 2014

Year (These units are spread over Semester 1 and Semester 2)

Compulsory Units (Students must register for all units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>ECTS</th>
<th>Compensatable</th>
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</thead>
<tbody>
<tr>
<td>PHR 4514</td>
<td>Pharmacy Practice V (pre-requisites PHR 1101, PHR 2103, PHR 3107 and PHR 4112) Synoptic Study Unit</td>
<td>40 ECTS</td>
<td>Non compensatable</td>
</tr>
<tr>
<td>PHR 4123</td>
<td>Pharmacy Practice Project IV (pre-requisites PHR 2018, PHR 3115 and PHR 4120)</td>
<td>20 ECTS</td>
<td>Non compensatable</td>
</tr>
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Number of ECTS for Semester I and II 60 ECTS
FIRST YEAR

INTAKE 2009

ACADEMIC YEAR 2009/2010
UNIT CODE: PHR 1101  UNIT TITLE: PHARMACY PRACTICE I

TYPE
Lectures, seminars, practicals and tutorials

NUMBER OF ECTS CREDITS: 8

LEARNING OBJECTIVES
To provide a general idea of what medicines are, how medicines are presented and classified.
To highlight safe procedures for handling medicines.
To discuss safe and effective administration of medicines.
To expose the student to real-life situations encountered at the community pharmacy.

CONTENT
History of pharmacy
Introduction to pharmacy literature and medical information
Career opportunities in pharmacy
The pharmacy course
Medicine presentation and medicine administration
Treating medicines with respect: Occurrence of side effects and drug interactions, pharmacovigilance and adverse drug reaction reporting, drug product development in the pharmaceutical industry
Community pharmacy practice
The community pharmacy
Dispensing prescriptions
Communication and counselling skills
Compliance and concordance
Diagnostic tests carried out in a community pharmacy
Medicines used in the treatment of: infections, cardiovascular disorders, hypertension, pain, respiratory system disorders, ear, nose and throat disorders, disorders of the gastrointestinal tract, skin disorders
Drugs affecting the Autonomic Nervous System
Medicine Action
Clinical Toxicology
Mathematical Principles of drug therapy
Use of reference books in pharmacy as a source of drug information
Research Methodology: References and bibliography
Participation at the yearly pharmacy symposium and discussion on the presentations
Practical experience in a community pharmacy: receiving of prescriptions and the dispensing of medicines, recording prescriptions, experience in recording purchases of narcotic and psychotropic drugs, the application of laws and regulations relating to community pharmacy, application of accepted standards of professional conduct and practice, ordering, storage and stock control of medicines, the supply of non-medical products.

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

- Part I Written Examination 95%:
  A three-hour written paper:
  Section A: 5 compulsory short questions (25 marks)
  Section B: compulsory short questions (75 marks)
  No marks will be allocated to partially correct answers.
  Held at the end of the second semester after first year

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

LECTURERS/DEMONSTRATORS
Lilian M. Azzopardi (Co-ordinator) Anthony Serracino Inglott
Alision Anastasi Louise Azzopardi
Denise Ellul 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


*Refer to guidelines for Community Pharmacy Practice.
UNIT CODE: PHR 1013  UNIT TITLE: SOCIAL ASPECTS OF PHARMACY

TYPE
Lectures and seminars

NUMBER OF ECTS CREDITS: 2

LEARNING OBJECTIVES
To make students conscious of the compassionate needs of the patient especially of those who need particular attention.
To give the student a basic understanding of the socio-legal aspects of pharmacy.

CONTENT
Effective communication studies
Body life and health
The concept of the human body and the embodied spirit
Moral view of the body and a bodily life
The meaning of bodily life
Responsible for health
Rehabilitation: dreams lost, dreams found (psychological view)
The meaning of death
The health care profession and the moribund patient
Moral lights and duties of the health care professionals
Ordinary and extraordinary treatments
The health care professional’s role following the patient’s death
Legal aspects: introduction to legal terms, discussion of case-law
Social aspects: introduction to sociological terms, sociological meaning of “profession” and “role”, sociology of medicine
Specific topics with legal and social implications: alcoholism, drug addiction, protection of medical data, AIDS, hepatitis

ASSESSMENT
Two assignments carrying 50% of the total mark each.

RESULT
Percentage mark and grade

LECTURERS
Lilian M. Azzopardi (Co-ordinator) Anthony Serracino-Inglott
Sandra Mifsud Bonnici Lilian Wismayer

READING LIST
☐ Laws of Malta for Pharmacy
UNIT CODE: PHR 1102
UNIT TITLE: PHARMACEUTICAL CHEMISTRY

TYPE
Lectures, Tutorials

NUMBER OF ECTS CREDITS: 10

LEARNING OBJECTIVES
To understand:
the types of chemical and physical bonding and their relation to structure, shape and reactivity of molecules
the basis of pharmaceutical and medicinal chemistry by introducing the more important mechanisms of organic reactions and the chemistry of functional groups and influence of different moieties on molecular stability and detection
the 3-dimensional nature of organic molecules and the nomenclature of stereochemistry in preparation for its application to drug design and its importance in biological activity
the chemistry of aromatic & heterocyclic compounds, carbohydrates, proteins, peptides, nucleotides and nucleic acids of special importance in pharmaceutical chemistry
To provide knowledge and understanding of the principles and concepts of chemical thermodynamics and chemical kinetics and their application to pharmacy

CONTENT
Consideration of the types of chemical bonding and their relationship to the structure and shape of molecules
Physical bonding, inter-molecular and intra-molecular forces, donor-acceptor concepts, complex formation
Stereochemistry of organic molecules
Introduction, including bond lengths and angles, constitution, configuration and confirmation
Optical isomerism including chirality
Geometric isomerism
Stereochemistry of reactions and conformations
The relevance of molecular geometry to biological activity
Projection formulae: Fischer, Newmann, sawhorse
Properties of organic compounds:
An introduction to the more important mechanisms of organic reactions and the influence of electronic effects on their reactions (induction and mesomerism)
The chemistry of the functional groups and the influence of aliphatic, aromatic and heterocyclic moieties, particularly with reference to molecular stability and detection
The chemistry of:
Polynuclear hydrocarbons such as naphthalene, anthracene etc.
The 5-membered and 6-membered heterocyclic aromatic compound e.g. furan, thiophen, pyrrole, pyridine
The diazines and the triazines
The fused ring systems e.g. indoles, purines etc.
Carbohydrates: mono-, di- and polysaccharides
Amino acids, proteins, peptides
Nucleotides and nucleic acid
Fats and oils

The First, Second, Third Law of Thermodynamics
Thermochemistry: work and heat
Chemical Equilibrium: entropy, gases
Free energy relation between equilibrium constant and free energy change
Equilibrium in solution
Order of reaction, 1st and 2nd order, rate constants, 1/2, drug stability studies, Arrhenius, shelf-life
ASSESSMENT
Written Examination of 3 hours held at the end of the second semester after the first year of the course.

RESULT
Percentage mark and grade

LECTURERS
Claire Shoemake (Co-ordinator)
Victor Ferrito

READING LIST
- The European Pharmacopoeia. The Pharmaceutical Press, London
- Ahuja S. Pharmaceutical Analysis, Chromatography in Molecular Biology and Biotechnology. Meyers R. ed. VCH publishers, New York
UNIT CODE: PHR 1301
UNIT TITLE: PHARMACEUTICS I

TYPE
Lectures and practicals

NUMBER OF ECTS CREDITS: 6

LEARNING OBJECTIVES
To introduce the student to the use of drugs to treat disease as well as to the dangers emanating from the use of these materials by society. The importance of giving the appropriate drug of the right quality at the right dose to the right patient at the right time will be emphasised.
To expose the students to the physicochemical principles concerned with the properties of the three states of matter, and interactions between these states. The knowledge of these properties can then be applied when discussing various aspects of formulation of pharmaceutical products.
To expose the students to the various types of dosage forms and to introduce the concept and basic aspects of drug formulation.
To expose the students to the various aspects of powder behaviour during pharmaceutical procedures such as powder particle size classification, size reduction, compressibility, mixing and segregation.

CONTENT
Introduction to pharmaceutics
The use of drugs
The conversion of drugs into medicines
Therapeutic drugs, social drugs and drugs of abuse
Pharmacopoeia, Codex, Formulary and other books of reference
Weights, measures and calculations
Dosage Forms including packaging and labelling
Therapeutic effects, toxic effects, side effects
Methods of administration
The importance of physical properties of drug substances on their efficacy and safety
Basic aspects of formulations

Pharmaceutical physics
Solids, Liquids and Gases: Physical properties of these states of matter, the gas laws, the liquid crystalline state.
Phase rule: the triphasic diagram of water, rules governing diphasic and triphasic mixtures of partially miscible liquids, or liquids/solids
Interfacial phenomena: surface tension, zeta potential; their measurement and their application to suspensions and emulsions.
Colloids: properties, types of detergents, micelle formation, critical micelle concentration
Basic principles of dissolution: Fick’s laws
Rheology: Newton’s relationship between force and displacement, Newtonian and non-Newtonian flow, thixotropy

Powders
Comminution: mechanisms of size reduction, grinding machines, validation of grinding
Classification of particle size: microscope method, sedimentation method, coulter counter, sieving
Bulk properties of powders: factors effecting packing properties, static angle of repose, dynamic angle of repose, flow meter, factors effecting flow rate, improving particle flow
Mixing: positive, negative and neutral mixing, perfect and random mix, economic time mixtures, mixing mechanisms, types of mixers
Segregation: factors promoting segregation, mechanisms of segregation, effect of mixing time on segregation.
Pharmaceutical calculations: expressions of concentration, triturations, calculations relating to dosage, conversions

Demonstration of application of principles of pharmaceutical physics in the areas of effect of solute concentration on viscosity, investigation of partition coefficient, buffering of pharmaceutical preparations, surface tension in pharmacy, three component phase diagrams

ASSESSMENT
Written Test of 2 hours.

RESULT
Percentage mark and grade

LECTURERS
Maurice Zarb Adami (Co-ordinator)
Edwina V Brejza

READING LIST
- Ansel HC, Stoklosa MJ. Pharmaceutical Calculations, 11th Edition- Lippincott, Williams and Wilkins,
UNIT CODE: PHR 1500
UNIT TITLE: CLINICAL TERMINOLOGY

TYPE:
Lectures, practicals and tutorials

NUMBER OF ECTS CREDITS: 2

LEARNING OBJECTIVES
To introduce students to patient care.
To help students to understand basic medical terminology.
To enable students to appreciate communication techniques with the patient.
To make it possible for students to adjust to the clinical environment.

CONTENTS
General introduction
Cardiovascular system 1
Cardiovascular system 2
Cardiovascular system 3
Cardiovascular system 4
Cardiovascular system 5
Respiratory system 1
Respiratory system 2
Gastrointestinal system
Hepatobiliary system
Nephrology system
Haematology system
Endocrinology system
Rheumatology system
Neurology system
Miscellaneous including infectious disease and psychiatry.
Practical Sessions at Clinical Sessions – Discussion of Case Studies

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

RESULT
Percentage mark and grade

LECTURERS/DEMONSTRATORS
Anthony Serracino-Inglott (Co-ordinator) Lilian M. Azzopardi
Bernard Coleiro Angelo Psaila
UNIT CODE: ANA 1003  UNIT TITLE: ANATOMY & HISTOLOGY

TYPE
Lectures

NUMBER OF ECTS CREDITS: 4

LEARNING OBJECTIVES
To understand the basic concepts of histology
To apply them to the study of organs and systems

CONTENT
Anatomy content
Epithelial Tissues
Connective Tissues
Cartilage and Bone
Muscular Tissues
Nervous Tissues
Skin
Blood and Blood Vessels
Lymphatic System
Digestive System
Urinary System
Reproductive System

Basic Histology content
This one credit course will consist of seven 2-hour sessions and is designed to provide a basic understanding of the structural organization of cells, tissues and organ systems at the microscopic level. Emphasis will be given to the dynamic relationships between normal structure and function, at cellular, tissue and organ level. To add interest to the course, clinical relevance will be highlighted at various points during the course, especially where this relates to abnormal structure at microscopic level.

ASSESSMENT
☐ Anatomy 2 hours written test  50% (first semester)
☐ Histology 1 hour written test   50% (second semester)

RESULT
Percentage mark and grade

LECTURERS
Michael Asciak        Ben Vella Briffa

READING LIST
Anatomy:
☐ Ellis, Harold, Clinical Anatomy
☐ Grant’s Atlas of Anatomy.
☐ Last, R.J. Anatomy
Histology:

A more advanced textbook, better intended for reference use is:
UNIT CODE: MAT 1900
UNIT TITLE: ELEMENTARY CALCULUS

TYPE
Lectures

NUMBER OF ECTS CREDITS: 4

LEARNING OBJECTIVES
This study unit is of A-level standard, and is suitable for First Year science students not majoring in Mathematics. Students who have Mathematics as a principal subject area cannot take this study unit.

CONTENT
Cartesian Coordinates;
Equations of lines and curves;
The derivative;
Rates of change;
Partial Differentiation;
Integration and applications;
Coordinate geometry;
   The circle,
   The ellipse.
   The hyperbola

ASSESSMENT
Written test of 2.5 hours held at the end of the study unit.

RESULT
Percentage mark and grade

LECTURERS/Demonstrators
Grace Galea

READING LIST
UNIT CODE: PHB 1041  UNIT TITLE: PHYSIOLOGY

TYPE
Lectures

NUMBER OF ECTS CREDITS: 4

LEARNING OBJECTIVES
To appreciate the scope of human physiology
To understand the fundamental concepts of organ function and interaction
To understand basic physiological homeostatic mechanisms
To appreciate the adaptations to stress and the environment
To study in some detail selected physiological functions more relevant to pharmacists

CONTENT
Cardiovascular physiology
Respiratory physiology
Renal physiology
Acid-base balance
Blood and the immune system
Gastrointestinal physiology
Endocrinology
Neuroscience
Bone, muscle, exercise

ASSESSMENT
Written test of three hours with 60 MCQs held at the end of the second semester.

RESULT
Percentage mark and grade

LECTURERS
Neville Vassallo (Co-ordinator)
Kirill Micallef-Stafrace

READING LIST
Main recommended:


Alternatives:


Supplementary/Reference:

UNIT CODE: PAT1322

UNIT TITLE: GENERAL AND PHARMACEUTICAL MICROBIOLOGY I

TYPE: Lectures

NUMBER OF ECTS CREDITS: 4

ASSESSMENT
Written, one paper, at the end of the 2nd semester

RESULT
Percentage mark and grade

LECTURERS
Prof Paul Cuschieri (Co-ordinator)
Dr. Christopher Barbara
Dr. A. McElhatton

Description
This study unit comprises
Introduction to Microbiology (Bacteriology) – Prof. Paul Cuschieri (PVC)
Introduction to Microbiology (Virology and Bacteriology) – Dr Christopher Barbara (CB)
Introduction and Principles of Sterilisation and Disinfection - Dr Anna McElhatton (AM)

Lectures:

Introduction to Microbiology (Bacteriology):
- Introduction to microbiology
- Microscopical morphology
- Basic microscopy
- Principles of bacterial taxonomy
- Organisation and structure of a ‘typical’ bacterial cell
- Intracellular organelles and storage granules - nature and functions
- Structure of cell walls - clinical importance; sphaeroplasts and protoplasts - clinical significance
- Structure of murein – therapeutic implications, the basis of resistance in MRSA
- Endotoxins and exotoxins – production and use of toxoids in immunisation, clinical applications
- The structure and role of the cytoplasmic membrane
- Bacterial capsules – structure, functions, roles in virulence
- Pigmentation
- Flagella
- Common fimbriae and sex pili
- Mutations, plasmids, transduction, transformation, transposons - therapeutic implications
- Bacterial spores - properties and biological importance

Introduction to Microbiology (Virology)
- Viral morphology and laboratory diagnosis
- Viral taxonomy
- Chlamydia, Mycoplasma and Rickettsia
- Influenza viruses
- HIV diagnostics
- Rotavirus
- Pox viruses
- Blood-borne infections
Principles of Sterilisation and Disinfection:
• Introduction, definition of terms, basic concepts
• Principles and methods of sterilisation; sterilisation controls
• Principles of disinfection, classes of disinfectants, modes of action

LEARNING OBJECTIVES
To deal with the principles of general microbiology, microbial structure, taxonomy, growth, replication, and the laboratory examination of micro-organisms, including basic virological techniques.
To expose the student to the theory on which common pharmaceutical microbiology practice is based. The unit content will also provide the student with hands-on experience on the theoretical aspects covered in the lectures.

Reading List
Recommended Textbooks:
Medical Microbiology and Infection, Tom Elliott et al, 4th Ed, ISBN 1405129329, Blackwell
Pharmaceutical Microbiology, W.B. Hugo and A.D. Russell, 7th Ed, 2007

Introduction to Microbiology (Bacteriology):
• Introduction to microbiology; differences between prokaryotic and eukaryotic cells; pathogenic and chemotherapeutic implications (2 lectures, PVC)
• Microscopical morphology as seen in a Gram-stained smear, including cocci, rods, filamentous bacteria, spirochaetes and spirilla (when relevant with regards to Gram-staining); commonly encountered bacteria in clinical, nursing, midwifery and pharmaceutical situations (4 lectures, PVC)
• Basic microscopy, the preparation and fixing of smears, direct and indirect staining techniques, their value in clinical practice, simple description and significance of the major staining methods and their clinical importance (3 lectures, PVC)
• Principles of bacterial taxonomy – the three subdivisions including: nomenclature, classification and identification (1 lecture, PVC)
• Organisation and structure of a ‘typical’ bacterial cell (1 lecture, PVC)
• Intracellular organelles and storage granules – structure, nature and functions; the basis of the selective properties of the antibiotics that inhibit protein synthesis (1 lecture, PVC)
• Structure of the cell walls of Gram-positive and Gram-negative bacteria; the role and importance of the murein component with clinical and therapeutic implications; sphaeroplasts and protoplasts – their clinical significance in relapsing infection with appropriate chemotherapeutic solutions (1 lecture, PVC)
• Structure of murein – therapeutic implications, the basis of resistance in MRSA (1 lecture, PVC)
• Endotoxins and exotoxins – differences, significance and role in the virulence of bacteria, relevant host-immune mechanisms, applications of our knowledge in the production and use of toxoids in immunisation, clinical applications (1 lecture, PVC)
• The structure and role of the cytoplasmic membrane, diffusion vs active transport; mesosomes – structure and function, chemotherapeutic implications (1 lecture, PVC)
• Bacterial capsules and micro-capsules – structure, functions, roles in virulence, visualisation; implications in immunity, immunisation and chemotherapy; appropriate examples of common capsulated pathogenic organisms (2 lectures, PVC)
• Pigmentation – examples and bacteriological/clinical significance (1 lecture, PVC)
• Flagella – their nature, basic structure, functions and arrangement; significance and role in survival of bacteria; clinical implications (1 lecture, PVC)
• Common fimbriæ and sex pilî – differences in structure and function, their roles in virulence and bacterial conjugation, clinical and chemotherapeutic implications (2 lectures, PVC)
• Mutations, plasmids, the transfer of genetic information by transduction and transformation, transposons; evolutionary, clinical, virulence and chemotherapeutic implications (2 lectures, PVC)

• Bacterial spores – Biological importance; properties including basic structure, microscopical visualisation, significance in high level disinfection and heat sterilisation; clinical implications with appropriate examples of common/dangerous pathogens and infections caused by them; the use of the hyperbaric chamber in the management of clostridial gas gangrene; their uses as biological controls for heat, ionising radiation and chemical processes for sterilisation of surgical instruments, disposables etc in industry, hospitals/clinics and laboratories (2 lectures, PVC)

Introduction to Microbiology (Virology)

• Viral morphology and laboratory diagnosis (1 lecture, CB)
• Viral taxonomy (1 lecture, CB)
• *Chlamydia, Mycoplasma* and *Rickettsia* (1 lecture, CB)
• Influenza viruses (1 lecture, CB)
• HIV diagnostics (1 lecture, CB)
• Rotavirus (1 lecture, CB)
• Pox viruses (1 lecture, CB)
• Blood-borne infections (1 lecture, CB)

Principles of Sterilisation and Disinfection:

• Introduction, definition of terms, basic concepts (5 lectures, AM)
• Principles and methods of sterilisation; sterilisation controls (5 lectures, AM)
• Principles of disinfection, classes of disinfectants, modes of action (5 lectures, AM)
UNIT CODE: PHR 1202  
UNIT TITLE: PHARMACEUTICAL ANALYSIS & CALCULATIONS

TYPE
Lectures, Tutorials

NUMBER OF ECTS CREDITS: 2

LEARNING OBJECTIVES
To provide knowledge and understanding of the principles and objectives of pharmaceutical analysis together with consideration of the fundamentals of measurement and separation science and of general theory of quantitative analysis emphasising concepts of accuracy and precision. To expose the student to the principles of pharmaceutical calculations as applied to drug delivery and formulation.

CONTENT
Data Handling:
Accuracy and precision; determinate and indeterminate errors; reproducibility and repeatability; propagation of errors and their calculations; confidence limits; confidence levels; control charts; validation of analytical methods; null hypothesis; sample and population parameters; the t- and F tests; rejection of results; regression analysis.

Theory of acids and bases:
Dissociation constants of weak acids and bases; calculation of theoretical titration curves of strong acid versus strong base, weak acid versus strong base, and weak base versus strong acid; hydrolysis of salts; buffers and calculations involved in the preparation of buffers; theory of indicators; choice of indicators.

Wet methods of analysis:
Principles of volumetric and gravimetric analysis; calculations involved in the preparation of stock and standard solutions and dilutions; solubility and solubility product; ionic product; common ion effect and precipitation.

Chromatography:
Basic principles of chromatography; mechanisms involved in separation; thin layer chromatography; column chromatography; gas liquid chromatography (GLC); high performance chromatography (HPLC); dead volume; retention times; net retention times; capacity factor; resolution; Number of theoretical Plates; Height equivalent of theoretical plate; band broadening and factors affecting band width; capillary columns; flow cells.

ASSESSMENT
Written test of 2 hours.

RESULT
Percentage mark and grade

LECTURERS
Maurice Zarb Adami (Co-Ordinator)
Victor Ferrito
RECOMMENDED READING

- PRICHARD E. Selecting the Method, Selecting the Equipment and Consumables in Quality Control in the Analytical Laboratory. John Wiley & Sons, Chichester (1997)
UNIT CODE: SOR 0210
UNIT TITLE: DATA TREATMENT AND PROBABILITY

TYPE
Lectures

NUMBER OF ECTS CREDITS: 2

CONTENTS
- Basic Ideas on Treatment of Data
  - Types of Data
  - Data collection
  - Coding and Sorting of Data
  - Presentation of Data
- Descriptive Statistics
  - Frequency Tables and Percentiles
  - Measures of Central Tendency
  - Measures of Dispersion
- Elementary Probability
  - Permutations and Combinations
  - Venn Diagrams and Simple Applications
  - Addition and Multiplication Rules
  - Conditional Probability
  - Mutually Exclusive and Independent Events
- Probability Distributions
  - Discrete Distributions: Uniform, Poisson, Binomial
  - Continuous Distributions: Exponential, Normal
  - Means, Variances and Standard Deviations

Suitable arrangements will be made for time and space to be allocated to the instruction and use in practice of elementary modules in statistical software, time and human resources permitting. The package/s, which will be used, would preferably form part of some widely used software like readily available spreadsheet applications.

ASSESSMENT
Written test of 1.5 hours held at the end of the course work.

LECTURERS
Various

READING LIST:
UNIT CODE: PHR 1026  
UNIT TITLE: INTRODUCTION TO MEDICINAL CHEMISTRY

TYPE  
Lectures, tutorials, demonstrations

NUMBER OF ECTS CREDITS: 2

LEARNING OBJECTIVES  
To introduce the basic concepts of medicinal chemistry  
To lay the foundations that will be made in reference to over the next 3 years of the Medicinal Chemistry Course.  
To establish the principles of what makes organic molecules “drug-like”

CONTENT  
Drug discovery by design – historical notions  
Drug design – schematics  
Combinatorial chemistry  
Computer modeling techniques  
Stereochemical consideration of lead compounds  
Principles of QSAR  
The contribution of different functional to biological function

ASSESSMENT  
Written test of 3 hours held at the end of the second semester.

RESULT  
Percentage mark and grade

LECTURER  
Claire Shoemake

READING LIST  
UNIT CODE: CIS 1004  UNIT TITLE: COMPUTING FOR CHEMISTS & PHARMACISTS

TYPE
Lectures

NUMBER OF ECTS CREDITS: 4

LEARNING OBJECTIVES
The aim of this unit is to give students the opportunity to gain practical experience in the use of word processors, spreadsheets, presentation software, basic web-page design and databases in a normal office environment, also including a basic introduction to computer terminology like computer definition terms.

CONTENT
Concepts presented will be those of using word-processing tools to create scientific reports. Use of presentation tools and presentation concepts by displaying suitable data., equations and formulae.

Use of spreadsheets to represent data tables, equations, formulae and data manipulation techniques, calculations and row operations. Use of spreadsheets for basic statistics processing like regression analysis, standard deviation least squares method, curve fitting, correlation theory production of graphs for scientific data analysis etc.

Basic data embedding concepts like OLE, DDE and their practical use, basic data exchange between different products. Introduction to databases and their use for scientific information storage access.

ASSESSMENT
- Written test of 2.5 hours  80%
- Assignment  20%

RESULT
Percentage mark and grade

LECTURER
Tony Spiteri Staines

READING LIST
UNIT CODE: LIN 1081
UNIT TITLE: IT-THADDIM TAL-MALTI GHALL-ISPJARA

TYPE
Lectures

NUMBER OF ECTS CREDITS: 2

CONTENT

ASSESSMENT
☐ Test 60%
☐ Tema assenjata 40%

RESULT
Marka u Grad

LECTURER
Michael Spagnol

READING LIST:
Qari rrakkomandat
UNIT CODE: SOR 0220*  UNIT TITLE: ELEMENTARY STATISTICAL THEORY

TYPE
Lectures

NUMBER OF ECTS CREDITS: 2

- Sampling
  - Populations and Samples
  - Selection of a Sample
  - Sampling Schemes and Designs: simple random, systematic, stratified, cluster and non-probability sampling
- Estimation
  - Estimators
  - Sample Mean, Proportion and Variance
  - Sampling Distributions
  - Sample size
  - Confidence Intervals
- Hypothesis Testing
  - Introduction
  - Tests on means, proportions, difference of means and difference of proportions of large samples
  - Contingency Tables
- Correlation and Regression
  - Linear Regression
  - Correlation

There will be time dedicated to the use of statistical software, preferably as part of some widely used software like the Excel Spreadsheet package, with reference to the material above.

ASSESSMENT:
Test of 1.5 hours held at the end of the second semester.

LECTURERS:
Various

READING LIST:

* Pre-requisite: SOR 0210 or equivalent.
UNIT CODE: PHR1120  UNIT TITLE: PHARMACY SPECIAL TOPICS I

TYPE
Practicals, Seminars, tutorials

NUMBER OF ECTS CREDITS: 2

LEARNING OBJECTIVES
This study unit enables the student to identify the processes for design, drafting and writing of scientific documents.

CONTENT
• Literature review techniques
• Accessing scientific documents and critical appraisal
• Handling data
• Report writing skills

ASSESSMENT
• Identification of study areas – 10%
• Critical appraisal of documents – 20%
• Literature search – 20%
• Collating the material in a methodical, scientific and evidence-based manner – 25%
• Participation – 25%

RESULT
Percentage mark and grade

LECTURERS
Lilian M. Azzopardi (Co-ordinator)  Maurice Zarb Adami
Anthony Serracino Inglott  Imelda Serracino Inglott
Lilian Wismayer
SECOND YEAR

INTAKE 2009

ACADEMIC YEAR 2010/2011
TYPE:
Lectures, seminars, practicals and tutorials

NUMBER OF ECTS CREDITS: 8

LEARNING OBJECTIVES
Introduction to minor disorders and their treatment
To give experience in presenting data and material in the form of posters and short oral presentation
Practical experience in Community Pharmacy

CONTENT
Geriatric Pharmacy Practice
Paediatric Pharmacy Practice
Drugs used in Pregnancy and Lactation
Symptoms presented at the Community Pharmacy: ear disorders, abdominal disorders, perianal and perivulval pruritus, musculoskeletal disorders, skin disorders: face and scalp, dandruff, eczema, dermatitis and fungal skin infections.
Foot Care
Eye Care
Oral and Dental Care
Sleep
Travel medicine and first aid
Parapharmaceuticals and medical devices
Wound management
Primary care health services
Community Pharmacy Management: principles of management of a community pharmacy, purchasing and inventory control, financial management
Introduction to hospital pharmaceutical services
Introduction to medicines regulatory affairs
Drug interactions and adverse effects
Medicine usage and patient needs
Formulary Systems: Introduction to policies and procedures involved in running a formulary
Complementary medicines
Pharmacy Practice Research: The scientific approach, basic principles of research, ethics in research, research design, psychometric evaluation, sampling, report writing
Participation at the yearly pharmacy symposium
Practical experience in a community pharmacy

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: 2 hours) 95%
  Section A: 14 compulsory short questions (5 marks each)
  Section B: 3 questions (10 marks each)
  Held at the end of the 2nd semester.
  No mark will be allocated to partially correct answers.

☐ Log Book: 5% The marks obtained from all practice sessions presented will be considered for the credit assessment. +

RESULT
Percentage mark and grade
LECTURERS/Demonstrators

Lilian M. Azzopardi (Co-ordinator)  Anthony Serracino-Inglott
Louise Azzopardi  Alison Anastasi
Adrian Busuttil  Denise Ellul
Gillian Soler  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


+ Refer to Guidelines for Community Pharmacy Practice

* Pre-requisite: PHR 1101
UNIT CODE: PHR 2105
UNIT TITLE: ASPECTS OF NUTRITION

TYPE: Lectures

NUMBER OF ECTS: 2

LEARNING OBJECTIVES
To provide students with a basic understanding of the link between biochemical pathways and nutrition. To introduce fundamental nutritional principles with particular emphasis on the pharmacy setting.

CONTENT
Carbohydrates: nutrition and metabolism
Fats: nutrition and metabolism
Proteins: nutrition and metabolism
Obesity and weight management
Vitamins: structure and function
Nutritional assessment and growth

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

RESULT
Percentage mark and grade

LECTURER
Lilian M. Azzopardi (Co-ordinator)  Anthony Serracino-Inglott
Claire Sillato-Copperstone
UNIT CODE: PHR 2108  
UNIT TITLE: REGULATORY AFFAIRS AND PHARMACY ETHICS

TYPE:
Lectures, seminars, and tutorials

NUMBER OF ECTS CREDITS: 2

LEARNING OBJECTIVES
Introduction to ethical theories, principles and norms, to analyse ethical issues and to guide ethical decision-making in pharmacy practice and pharmaceutical regulatory affairs. To identify ethical issues, discuss alternative solutions and justify decision using carefully reasoned arguments. To develop moral attitudes and character traits which can subsequently be employed in pharmacy practice.

CONTENT
**Pharmaceutical Regulatory Affairs:**
Introduction to pharmaceutical regulatory affairs
An overview of global issues, different approaches to regulation, first and second wave markets
The European Union and free movement of goods: liberalisation of trade versus restriction and control
Medicines regulation: placing a medicinal product on the market.
Good Manufacturing Practice (GMP), Good Distribution Practice (GDP) and Good Clinical Practice (GCP)
The rational use of medicinal products in terms of a regulatory framework
Pharmacovigilance and post marketing surveillance
National issues versus harmonization: current initiatives and developments in the regulatory field

**Pharmacy Ethics:**
Foundations of an ethics of character and virtue
Pharmacy as a profession
Codes of Ethics for Pharmacy and their contemporary relevance
Structure of the pharmacist-patient relationship
• patient as person
• person as patient
Pharmacist and patient: the caring relationship
Inter - and intra - professional relationships
Diagnosis, prognosis and benevolence communication and truth telling
Decision-making and respect for patient as person
Justice and access to health care
Responsibility and accountability

ASSESSMENT
☐ Written test of 2 hours 95%
☐ Assignment and case presentations 5%

RESULT
Percentage mark and grade

LECTURERS/Demonstrators
Lilian M. Azzopardi (Co-ordinator)  
Anthony Serracino-Inglott
Lilian Wismayer  
Mary Anne Ciappara
Emmanuel Agius
UNIT CODE: PHR 2018  
UNIT TITLE: PHARMACY PRACTICE
PROJECT I

TYPE: Project

NUMBER OF ECTS CREDITS: 2

LEARNING OBJECTIVES
Selection of project and presentation of written short proposal for project

CONTENT
Selection of project on an aspect of practical pharmacy as approved by the Head of Department
Proposal
Poster presentation
Participation at Project Presentations
Literature Review

ASSESSMENT
- *Proposal and Literature Review 50%
- Poster presentation 30%
- Participation at project presentation 20%

* must be presented by the beginning of the second semester of the second year

RESULT
Percentage mark and grade

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

READING LIST
UNIT CODE: PHR 2026*  
UNIT TITLE: MEDICINAL CHEMISTRY I

TYPE:  
Lectures, practicals, seminars and presentations

NUMBER OF ECTS CREDITS: 6

LEARNING OBJECTIVES
To present an introduction to medicinal chemistry by reviewing the properties of the major organic functional groups and their influences on the water and lipid solubility; in vitro and in vivo stability; and on the molecular geometry, biological activity of molecules. To proceed to understand the various principles applied to drug design with emphasis on qualitative and quantitative structure-activity and structure property relationships as exemplified by specific drugs, classified pharmacologically and/or chemically. Emphasis will also be made on the importance of pharmaceutical nomenclature.  
To introduce basic principles in chemical analysis, in particular with reference to analysis of foods and pharmaceuticals.

CONTENT
Review of organic functional groups with examples of biological and pharmaceutical importance  
The effect of geometric isomerism and stereochemistry, chirality on drug formulation, disposition, activity and toxicity  
The correlation of structure to biological activity  
Photosensitising drugs  
Rational drug design based on ionisation studies of H2-antagonists  
Bioisosterism  
The Prodrug concept and rationale  
Historical development and applications of QSAR - methods of drug design, computer aided drug design  
Drug profile – Introduction to Structure Activity Relationship (SAR) studies of various drug classes, through formal lectures, group and individual research, presentation and discussion. Drug classes include: Sympathomimetics and anticholinergic drugs; beta-lactam antibiotics and their subclasses  
The prodrug approach to antibiotics.  
Practical aspects: Calibration of glassware  
Chemical analysis in water for injections – analysis of sulphates, pH testing, conductivity testing  
Moisture content in grains – comparison of two different methods  
Analysis of active content in Calcium lactate tablets  
Determination of shelf life  
Methodology researching

ASSESSMENT
☐ Written test (Duration of 3 hours) 95%
☐ Presentation, assignment and practicals 5%

RESULT
Percentage mark and grade

LECTURERS/Demonstrators
Claire Shoemake (Co-ordinator)  
Mary Anne Sant-Fournier  
Gordon Zammit  
Simon Serge
READING LIST


* Pre-requisite PHR 1026.
UNIT CODE: PHR 2304*  UNIT TITLE: PHARMACEUTICS II

TYPE: Lectures, Tutorials

NUMBER OF ECTS CREDITS: 6

LEARNING OBJECTIVES
To expose the student to the various aspects which have to be considered when formulating preparations (apart from oral solid dosage forms) for use as medicines, how these aspects of formulation are influenced by the desired route of administration, as well as how these same aspects effect the therapeutic profile of the drugs in use.

CONTENT
Dispersed systems: advantages and disadvantages of dispersed systems, types of dispersed systems, classification of dispersed systems according to particle size
Surfactants: hydrophilic-lipophilic balance (HLB), pharmaceutical uses of surfactants, chemical classification of surfactants, HLB calculations
Suspensions: characteristics, physicochemical principles underlying the sedimentation, wetting, rheology, crystal growth and particle interaction of solids in suspension, suspension formulation, types of powders used in suspensions. Extemporaneous preparation.
Percutaneous drug delivery: mechanism of percutaneous absorption, topical dosage forms, gels, emulsion-type semisolids, formulation components and optimisation factors
Aerosols: Drug characteristics, propellants, surfactants, primary packaging, containers, valve structure and function, biophysical issues, formulation of solution and suspension aerosols, manufacture and packaging
Medicinal gases.

ASSESSMENT
Written Test of 2 hours

RESULT
Percentage mark and grade

LECTURERS
Maurice Zarb Adami (Co-ordinator)
Edwina V. Brejza

READING LIST

* Pre-requisite: PHR 1301.
UNIT CODE: PHB 2042  
UNIT TITLE: BIOCHEMISTRY & MOLECULAR BIOLOGY

TYPE
Lectures

NUMBER OF ECTS CREDITS: 4

LEARNING OBJECTIVES
An introduction to the study of Biochemistry and Molecular Biology. Emphasis is given to the application of biochemistry and molecular biology to the health sciences.

CONTENT
Molecular logic of life
Cells
Biomolecules
Water
Amino acids, peptides and proteins
3-D structure of proteins
Protein Function
Enzymes
Carbohydrates and glycobiology
Nucleotide and Nucleic acids
Lipids
Biological membranes and transport
Biosignalling
Glycolysis and catabolism of hexoses
Citric Acid Cycle
Oxidation of fatty acids
Amino acid oxidation and production of urea
Oxidation phosphorylation and photophosphorylation
Carbohydrate biosynthesis
Genes and chromosomes
DNA metabolism, DNA replication and protein metabolism
Recombinant DNA technology

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

RESULT
Percentage mark and grade

LECTURER
Renald Blundell

READING LIST
UNIT CODE: PAT2322

UNIT TITLE: GENERAL AND PHARMACEUTICAL MICROBIOLOGY II

TYPE: Lectures

Number of ECTS Credits: 4

ASSESSMENT
Written, one paper, at the end of the 2nd semester

RESULT
Percentage mark and grade

LECTURERS
Prof Paul Cuschieri (Co-ordinator)
Dr. Christopher Barbara
Dr. Anna McElhatton

Description
This study unit comprises
Advanced Microbiology (Bacteriology) – Prof. Paul Cuschieri (PVC)
Advanced Microbiology (Virology and Bacteriology) – Dr Christopher Barbara (CB)
Selected Bacterial Pathogens – (AM)

Advanced Microbiology (Bacteriology):
• Counting bacteria; principles, techniques, indications for use, importance in industry and food bacteriology
• The bacterial growth curve; clinical and chemotherapeutic applications; introduction to microbicidal and microbistatic agents
• Bacterial nutrition; growing organisms
• Oxygen requirements, clinical implications
• Principles of bacterial metabolism and respiration
• Physical conditions required for growth
• Media – classification, uses, components

Advanced Microbiology (Virology and Bacteriology):
Varicella; Japanese encephalitis virus; Cholera; Diphtheria; Haemophilus invasive disease and Pneumococcal invasive disease

Selected Bacterial Pathogens:
Staphylococcus; Streptococcus; Haemophilus;
Mycobacterium;
Neisseria and Nocardia

LEARNING OBJECTIVES

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. The principles underlying bacterial nutrition and physiology, and isolation on artificial culture media are explained.
Reading List

Recommended Textbooks:


Advanced Microbiology (Bacteriology):

- Counting bacteria – viable and total counts; principles and techniques; indications for use in clinical, nursing, midwifery, and pharmaceutical circumstances; importance in industry and food bacteriology (3 lectures, PVC)
- The bacterial growth curve; clinical and chemotherapeutic applications; introduction to microbicidal and microbistatic agents (1 lecture, PVC)
- Bacterial nutrition; growing organisms (1 lecture, PVC)
- Oxygen requirements, clinical implications in polymicrobial infections (1 lecture, PVC)
- Principles of bacterial metabolism and respiration (1 lecture, PVC)
- Physical conditions required for growth (1 lecture, PVC)
- Media – Classification and uses (2 lectures, PVC)
- Common components of media (3 lectures, PVC)

Advanced Microbiology (Virology and Bacteriology):

- Varicella (1 lecture, CB)
- Japanese encephalitis virus (1 lecture, CB)
- Cholera (1 lecture, CB)
- Diphtheria (1 lecture, CB)
- *Haemophilus* invasive disease caused by capsular type b (1 lecture, CB)
- Pneumococcal invasive disease (1 lecture, CB)

Selected Bacterial Pathogens (not otherwise dealt with in the immunisation lectures in the first semester of the third year by PVC):

- *Staphylococcus* (2 lectures, AM)
- *Streptococcus* (2 lectures, AM)
- *Haemophilus* (1 lecture, AM)
- *Mycobacterium* (3 lectures, AM)
- *Neisseria* (2 lectures, AM)
- *Nocardia* (1 lecture, AM)
UNIT CODE: PHR 2203  UNIT TITLE: PHARMACEUTICAL ANALYSIS I

TYPE:
Lectures, Tutorials

NUMBER OF CREDITS: 4

LEARNING OBJECTIVES
To reinforce and extend the knowledge and understanding of the basic principles underlying the use of electrochemical, enzymatic and other methods of analysis of drugs and their derivatives and the factors influencing the choice of method of analysis used including limits of detection, sample preparation, derivatization, interference, sample size, etc. Special attention will be given to the selection of appropriate methodologies for specific problems in the qualitative and quantitative analysis of drugs.

To reinforce and extend the knowledge and understanding of the basic principles underlying the use of spectroscopic methods and the factors influencing the choice of method of analysis used including limits of detection, sample preparation, derivatization, interference, sample size etc. Relevance to methods used to quality assurance will also be highlighted.

CONTENT
Basic principles underlying the use of various methods of analysis of drugs and their derivatives:
Electrochemistry: theoretical basis, ion-selective electrodes, potentiometric titrations, biological cell-potentials
Consideration of spectroscopic methods: Ultraviolet and visible, Fluorescence, Emission and Atomic Absorbance, Qualitative Infra-Red, Nuclear Magnetic Resonance, Mass Spectroscopy, Instrumentation, Interpretation of spectra

ASSESSMENT
Written test of 2 hours

RESULT
Percentage mark and grade

LECTURERS
Claire Shoemake (Co-ordinator)
Victor Ferrito

READING LIST
UNIT CODE: PHR 2036  UNIT TITLE: PHARMACEUTICAL KINETICS & STABILITY TESTING

TYPE
Lectures, Tutorials

NUMBER OF ECTS CREDITS: 4

LEARNING OBJECTIVES
To introduce the student to the concept of kinetics as representing a time-dependent change in a parameter. The student will become familiar with the basic concepts of kinetic processes, and the various factors that can affect the kinetics of a particular process.
To demonstrate the applications of kinetics in pharmaceutics, particularly the concept of stability of dosage forms and the methods used to monitor stability.

CONTENT
Pharmaceutical kinetics
- Aims and applications of kinetics studies
- Order of kinetic processes, rates and order of reactions, definition of law of mass action, order, molecularity, complex reactions, specific rate constant.
- Order of reactions and units of the basic rate constants for zero, first and second order, pseudo order. Determination of order, description of substitution method, graphic method and half-life method.
- Complex reactions: reversible reactions, parallel or side reactions, series or consecutive reactions, rate determining step.
- Influence of temperature on reaction rates: Arrhenius equation, determination of A and E using graphic methods.
- Classic collision theory of reaction rates: Boltzmann distribution law, comparison between the collision rate theory and the Arrhenius equation, transitional state theory, comparison of the transitional state theory with the collision rate theory and the Arrhenius Equation.
- Effects of solvent on reaction rates: rate equations in terms of the activity of species in their transition state and in terms of activity coefficients, influence of the polarity of solvents on reaction rates.
- Influence of ionic strength on reaction rates: definition of ionic strength, activity coefficient in terms of ionic strength using the Debye-Huckle equation for a bimolecular reaction, graphic relationship between reaction rates and ionic strength.
- Effect of dielectric constant on reaction rates: definition of dielectric constant, relationship between reaction rates and dielectric constant, influence of the nature of solvents, solutions and ionic strength on dielectric constant and reaction rates, pharmaceutical significance of dielectric constant.
- Catalysis: definition and types of catalysts, operation of catalysts, specific acid-base catalysis and their rate-pH profiles, general acid-base catalysis and their rate-pH profiles, enzymes as biological catalysts, co-operativity and hysteresis.

Stability testing
- Application of kinetic principles of pharmacy: shelf-life and the Q10 method.
- Stability concerns in dosage forms: physical, chemical, therapeutical and microbiological changes in a dosage form, hydrolysis and oxidation as the major reactions providing stability concerns.
- Methods for determining the stability of a dosage form: isothermal and nonisothermal accelerated stability studies, handling and plotting of data from an isothermal accelerated stability study to extract the shelf-life of a product.

ASSESSMENT
Written test of 2 hours
RESULT
Percentage mark and grade

LECTURERS
Maurice Zarb Adami (Co-ordinator)
Edwina Brejza

READING LIST
- The British Pharmacopoeia Vols I & II. The Stationery Office.
  ISBN 0113222580.
UNIT CODE: PAT 2121  UNIT TITLE: PATHOLOGY

TYPE
Lectures

NUMBER OF ECTS CREDITS: 4

Pre-requisite study units: Basic Anatomy, Physiology & Biochemistry

DESCRIPTION:
This study unit provides an introduction to the study of general and systematic pathology. General pathology topics include: the causes of disease, cell injury, disorders of cell growth and differentiation, acute and chronic inflammation, repair mechanisms, atherosclerosis, thrombosis, embolism, ischaemia, infarction, genetic disorders and neoplasia. There is an introduction to the study of fluid and electrolyte imbalance and of environmental and nutritional disorders. Systematic pathology lectures cover the major common diseases affecting the various body systems, including the blood and immune system.

LEARNING OBJECTIVES
By the end of the course the student should:
1. become familiar with pathological terminology
2. understand the basic pathological processes underlying disease
3. become familiar with pathological mechanisms in inflammation, ischaemia, genetic disorders, neoplasia, homeostasis and immunity
4. become familiar with the common medical conditions discussed
5. appreciate the role of pathology in clinical management

ASSESSMENT
Subject Test – Written Paper – MCQs

RESULT
Percentage mark and grade

Attendance: Attendance is obligatory

LECTURERS/DEMONSTRATORS
B. Ellul – CO-ORDINATOR
L. Agius, A. Aquilina, G. Buhagiar, D. Busuttil, J. Degaetano

READING LIST
UNIT CODE: CPH 2010  UNIT TITLE: PHARMACOLOGY A

TYPE: Lectures and seminars

NUMBER OF ECTS CREDITS: 6

LEARNING OBJECTIVES
i. To provide a sound understanding of the principles underlying the therapeutic action of drugs
ii. To give students a general introduction to pharmacokinetics i.e. the determinants of the time course of the drug in the body, applying pharmacokinetic principles in order to provide rational drug therapy.
iii. To understand the mechanism, modes of actions and pharmacology of NSAIDS, vitamins, and drugs used in GI tract

CONTENT
Molecular pharmacology, drug development and pharmacogenetics
Drug-drug interactions, adverse drug reactions, drug allergies
Pharmacotoxicology and drug abuse in sports
New methodologies in pharmacological therapy
Pharmacoeconomics in therapeutics
Paediatric and geriatric pharmacology
Introduction and definitions of pharmacokinetics and pharmacokinetic terms - half-life, volume of distribution, protein binding, clearance
LADME system: drug absorption mechanisms, distribution, metabolism, elimination
Compartmental pharmacokinetic models: interpretation of plasma concentration time curves; curve fitting, method of residuals, area under the curve; problem solving with use of semi-log paper
Drugs used in the GI tract: antacids and other drugs for dyspepsia, ulcer healing drugs, H2 antagonists, proton pump inhibitors, laxatives, antidiarrheals, antiemetics
NSAIDS: mode of action; clinical use and indications, COX1 and COX2 inhibitors; ADRs
Vitamins: mode of action; clinical use and indications, COX1 and COX2 inhibitors; ADRs

ASSESSMENT
In the continuous and final mode: i.e. continuous assessments and final credit test at end of study unit

☐ Written test of 3 hours: 90%
☐ Assignment: 10%

RESULT
Percentage mark and grade

LECTURERS
Roger Ellul-Micallef
Anthony Fenech
Doriette Soler
Janet Mifsud
Frederick Fenech

READING LIST
☐ Laurence and Bennett. Clinical Pharmacology. Churchill Livingston
UNIT CODE: SOR 0230*  UNIT TITLE: STATISTICAL ANALYSIS IN PRACTICE USING SPSS

TYPE: Lectures

NUMBER OF ECTS: 2

LEARNING OBJECTIVES
- Parametric Tests
  - One sample t-test
  - Independent sample t-test
  - Paired sample t-test
  - One-way ANOVA test
  - Two-way ANOVA test
- Non-Parametric Tests
  - Kolmogorov Smirnov Test
  - Sign Test
  - Mann Whitney Test
  - Wilcoxon signed rank test
  - Kniskal Wallis test
  - Friedman test
  - Runs test
- Regression Models
  - Simple Linear Regression Models
  - Multiple Linear Regression Models
  - Non-Linear Regression Models
- Generalized Linear Models
  - Analysis of Variance Models
  - Analysis of Covariance Models
- Factor Analysis by Principal Components
- Log Linear Models
  - Chi square test for independence
  - Two way log linear models
  - Three way log linear models
- Project
  - Use of some sophisticated Statistical Software package, like SPSS, in a project which will involve material treated above

The emphasis of this unit will be exclusively on the practical side. Interpretation of results rather than theoretical justification of their use forms the bulk of the material covered.

ASSESSMENT
Assignment

RESULT
Percentage mark and grade

LECTURERS
Various
READING LIST


*Pre-requisites: SOR 0210 and SOR 0220 or equivalent.*
UNIT CODE: CPH 2011*          UNIT TITLE: PHARMACOLOGY B

TYPE: Lectures and seminars

NUMBER OF ECTS CREDITS: 4

LEARNING OBJECTIVES
I. This module deals with the principles of neuropharmacology and the covers various aspects of how different classes of drugs affect the brain. Various neurotransmitter systems are discussed together with the interaction of drugs on the various neurophysiological processes involved in brain function.
II. To understand the basic pharmacology and mode of action of drugs used to treat disorders associated with the cardiovascular system
III. Review of drugs that affect blood and blood forming organs; haematopoiesis and blood coagulation; drugs used in endocrine disorders.

CONTENT
Classification of the nervous system and the role of the blood brain barrier
Nerve cells and neural communication: neurons and glial cells
Electrical properties of neurons: generation and conduction of nerve impulse
Action potential; ion channels; synaptic transmission
Receptors: ionotropic and metabotropic receptors. Drugs acting as agonists and antagonists
Neurotransmitters. Pharmacological intervention on various neurotransmitter pathways
Methods of studying the nervous system. Pharmacological methods.
Drugs affecting cholinergic transmission. The role of acetylcholine
Drugs affecting major inhibitory neural transmissions: GABA and glycine
Serotonin and dopamine. Pharmacological intervention in diseases involving higher cognitive functions; Excitatory neurotransmission: drugs acting on glutamate and the NMDA receptor
Neuropeptides
Noradrenergic transmission. Adrenergic receptor agonists and antagonists
Relevant physiology and anatomy of cardiac function and circulation
Beta and alpha blockers; calcium antagonists
Centrally acting drugs and vasodilators
Ace inhibitors; diuretics; nitrates and cardiac inotropes
Antiarrhythmic drugs and thrombolytics and anticoagulants; Lipid lowering drugs
Drugs acting on blood and blood forming organs e.g. Iron, vitamin B_{12}, folic acid
Coagulation disorders. Vitamin K, Warfarin and heparin
Anti-platelet drugs and fibrinolytic agents

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

RESULT
Percentage mark and grade

LECTURERS
Janet Mifsud       Frederick Fenech
Charles Scerri

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

Pre-requisite: CPH 2010
UNIT CODE: PHR2120
UNIT TITLE: PHARMACY SPECIAL

TOPICS II

TYPE:
Practicals, Seminars and tutorials

NUMBER OF ECTS CREDITS: 2

LEARNING OBJECTIVES
This study unit enables the student to develop the skills required for critical reading and writing.

CONTENT
• Evaluation of research-based articles
• Collation of background information
• Development of scientific articles

ASSESSMENT
• Appropriate literature search – 20%
• Critical reading – 30%
• Critical writing – 30%
• Participation – 20%

RESULT
Percentage mark and grade

LECTURERS
Lilian M. Azzopardi
Anthony Serracino Inglott
Lilian Wismayer
Maurice Zarb-Adami
Imelda Serracino Inglott
THIRD YEAR
INTAKE 2009
ACADEMIC YEAR 2011/12
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 Manduca                   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


* 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
J J Borg
Frederick Fenech
Janet Mifsud
Anthony 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

E
Lectures

NUMBER OF ECTSCREDITS: 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)
- Diphtheria 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)
- Multi-resistant 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)
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
FOURTH YEAR

INTAKE 2009

ACADEMIC YEAR 2012/2013
UNIT CODE: PHR 4120*  UNIT TITLE: PHARMACY PRACTICE
PROJECT III

TYPE
Project

NUMBER OF ECTS CREDITS: 12

LEARNING OBJECTIVES
This unit emphasises the importance of techniques used during field work

CONTENT
Field work
Collection of data and analysis

ASSESSMENT
☐ Field work and Progress Report 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-requisites: PHR 2018 and PHR 3115.
UNITCODE: PHR 4401  UNIT TITLE: CLINICAL PHARMACY

TYPE
Placement, tutorials

NUMBER OF ECTS CREDITS: 20

LEARNING OBJECTIVES
A practice-oriented approach is adopted within this module to encompass the pharmacist’s intervention in patient care at the patient’s bedside as well as at out-patient clinics.

CONTENT
Students are assigned for a clinical attachment to experience application of pharmacotherapeutics in the practical scenario. Students will experience clinical factors that influence drug use and delivery of pharmaceutical care.

ASSESSMENT
Log book

RESULT
Pass or fail

LECTURERS/DEMONSTRATORS
Lilian M. Azzopardi (Co-ordinator)  Anthony Serracino Inglott
Marise Gauci  Anton Spiteri
Owen Farrugia  Conrad Buttigieg Scicluna
UNITCODE: PHR 4402        UNIT TITLE: PHARMACEUTICAL ANALYSIS

TYPE
Placement, tutorials

NUMBER OF ECTS CREDITS: 20

LEARNING OBJECTIVES
A practice-oriented approach is adopted within this module to encompass activities of a pharmacist in the field of pharmaceutical analysis.

CONTENT
Students are assigned for a practical attachment to experience analytical skills within a practical scenario.

ASSESSMENT
Log book

RESULT
Pass or fail

LECTURERS/DEMONSTRATORS
Maurice Zarb Adami (Co-ordinator)        Claire Shoemake
Owen Farrugia                              Conrad Buttigieg Scicluna
UNITCODE: PHR 4404  UNIT TITLE: PHARMACY ADMINISTRATION

TYPE
Placement, tutorials

NUMBER OF ECTS CREDITS: 20

LEARNING OBJECTIVES
A practice-oriented approach is adopted within this module to encompass activities of a pharmacist in the field of pharmacy administration.

CONTENT
Students are assigned for a practical attachment to experience administrative skills within a practical scenario.

ASSESSMENT
Log book

RESULT
Pass or fail

LECTURERS/DEMONSTRATORS
Lilian M. Azzopardi (Co-ordinator)  Anthony Serracino Inglott
Maurice Zarb-Adami  Claire Shoemake
Owen Farrugia  Conrad Buttigieg Scicluna
UNITCODE: PHR 4444  UNIT TITLE: HOSPITAL PHARMACY

TYPE
Placement and tutorials

NUMBER OF ECTS CREDITS: 20

LEARNING OBJECTIVES
A practice-oriented approach is adopted within this module to encompass activities of a pharmacist in the field of hospital pharmacy.

CONTENT
Students are assigned for a practical attachment to experience hospital pharmacy practice within a hospital scenario.

ASSESSMENT
Log book of practice

RESULT
Pass or fail

LECTURER/Demonstrators
Lilian M. Azzopardi (Co-ordinator)  Anthony Serracino Inglott
Maurice Zarb Adami  Marise Gauci
Lilian Wismayer  Anton Spiteri
Owen Farrugia  Conrad Buttigieg Scicluna
UNITCODE: PHR 4445        UNIT TITLE: CLINICAL ANALYSIS

TYPE
Placement and tutorials

NUMBER OF ECTS CREDITS: 20

LEARNING OBJECTIVES
A practice-oriented approach is adopted within this module to compass activities of a pharmacist in the field of clinical analysis.

CONTENT
Students are assigned for a practical attachment to experience clinical analysis skills within a practical scenario.

ASSESSMENT
Log book of practice

RESULT
Pass or fail

LECTURERS/DEMONSTRATORS
Lilian M. Azzopardi (Co-ordinator)        Anthony Serracino Inglott
Maurice Zarb Adami        Owen Farrugia
Conrad Buttigieg Scicluna
UNITCODE: PHR 4446   UNIT TITLE: INDUSTRIAL PHARMACY

TYPE
Placement and tutorials

NUMBER OF ECTS CREDITS: 20

LEARNING OBJECTIVES
A practice-oriented approach is adopted within this module to compass activities of a pharmacist in the field of industrial pharmacy.

CONTENT
Students are assigned for a practical attachment to experience industrial pharmacy skills within a pharmaceutical industry.

ASSESSMENT
Log book

RESULT
Pass or fail

LECTURERS/Demonstrators
Anthony Serracino Inglott (Co-Ordinator)   Lilian M. Azzopardi
Maurice Zarb Adami                        Claire Shoemake
Owen Farrugia                            Conrad Buttigieg Scicluna
UNIT CODE: PHR 4112*  UNIT TITLE: PHARMACY PRACTICE IV

TYPE
Lectures, seminars, practicals and tutorials

NUMBER OF ECTS CREDITS: 6

LEARNING OBJECTIVES
To equip students with knowledge on classes of drugs required in patient counselling
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.

CONTENT
Drugs acting on the Gastrointestinal System:
- Control of gastric acidity and treatment of peptic ulcers
- Agents affecting gastrointestinal water flux and motility, emesis
- Inflammatory bowel disease, constipation and diarrhoea
Endocrine and Metabolic Disorders:
- Thyroid disorders, Diabetes, Anaemia
Neurologic Disorders
- Parkinsonism, Headache, Pain Management
Rheumatic disorders, Osteoarthritis and Gout
Bone disorders
Cancer Chemotherapy
Critical Care Therapeutics
Infectious Diseases
Techniques in Patient Counselling and Education
Recent advances in pharmacotherapy
Chronotherapeutics
Pharmacy Practice and the Healthcare System
Assessment of nutritional status and estimating nutritional requirements
Nutrition support- oral, enteral and parenteral feeding
Special diets- vegetarianism, allergies, modified consistency meals
Nutrition management in coronary heart disease
Nutrition management in diabetes
Menu requirements and nutrition analysis of hospital meals
Participation at the yearly symposium
Practical experience in a community pharmacy

ASSESSMENT
- □ Part II Written Examination.
  Questions will contain a spread of questions from the whole syllabus to assess students' knowledge.
  A three-hour written paper:  95%
  Section A: compulsory short questions (40 marks)
  Section B:  4 questions to choose 3 (20 marks)
  No marks will be allocated to partially correct answers.
  Held at the end of the second semester after fourth year of the course.
- □ Log Book:  5%. The marks obtained from all practice sessions presented will be considered for the assessment.

RESULT
Percentage mark and grade
LECTURERS/Demonstrators
Lilian M. Azzopardi (Co-ordinator) Anthony Serracino Inglott
Claire Sillato Copperstone Doris Baldacchino
Denise Ellul Conrad Buttigieg Scicluna

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, PHR 2103 and PHR 3107.
UNIT CODE: PHR 4308*  UNIT TITLE: PHARMACEUTICS IV

TYPE
Lectures and practicals

NUMBER OF ECTS CREDITS: 6

LEARNING OBJECTIVES
To expose the student to the particular requirements for the treatment of patients in specialised areas, and familiarise them with pharmaceutical procedures which will enable them to function effectively as members of the multidisciplinary health team.
To present a general outlook to Pharmaceutical Biotechnology, the importance of which in pharmaceutics is rapidly increasing, given the current trend of utilizing endogenous effectors rather than compounds of xenobiotic origin as pharmacological agents.
To expose the student to the particular requirements of patients in specialised areas, and familiarise them with the pharmaceutical procedures which will enable them to function effectively as members of a multidisciplinary health team.
To present a general outlook to Pharmaceutical Biotechnology, the importance of which in pharmaceutics is rapidly progressing, given the current trend of utilising endogenous effectors rather than compounds of xenobiotic origin as pharmacological agents.

CONTENT
Specialised dosage forms
Radiation medicine, radiology and other aspects of diagnostic imagery.
Consideration of radiological techniques with emphasis on radiopharmaceuticals.
Chemotherapy and treatment of neoplastic disease.
Overview of materials used in the treatment of neoplasms and the pharmaceutical manipulations involved.
Anaesthesia and Resuscitation
Pharmaceutical aspects of local and general anaesthetics and their use in medicine.
Pharmaceutical Biotechnology
Definitions, biological response modifiers, examples, classification.
Monoclonal antibodies, Recombinant DNA technology, fermentation and cell culture, formulation of biotechnology products, in particular stability issues of protein pharmaceuticals. Analytical techniques used in biotechnology.
Further aspects of antimicrobial therapy
Cephalosporins, Glycopeptides and lipoglycopeptides: vancomycin, teicoplanin Fluoroquinolones, First line anti-tuberculous agents, Penicillins, Carbapenems and the monobactams, Miscellaneous compounds, Anti-fungal agents, Anti-HIV agents, Other anti-viral agents.

ASSESSMENT
☐ Written examination of 3 hours divided into 3 sections  90 %
☐ Practicals: 10%

RESULT
Percentage mark and grade

LECTURERS/DEMONSTRATORS
Maurice Zarb Adami (Co-ordinator)
Edwina V Brejza
Paul Caruana
Paul Cuschieri
Clarissa Captur
READING LIST


* Pre-requisites: PHR 1301, PHR 2304, PHR 3306, PHR 3307, PAT 1322, PAT 2322 and PAT 3323)
UNIT NO: PHR 4211*  UNIT TITLE TOTAL QUALITY SYSTEMS II

TYPE
Lectures

NUMBER OF ECTS: 2

LEARNING OBJECTIVES
To reinforce the principles, aims and objectives introduced in PHR 3030 - Total Quality Systems I.

CONTENT

ASSESSMENT
Written Test of 3 hours held at the end of the second semester.

LECTURERS
Claire Shoemake (Co-ordinator)
Stephen Ferrito

* Pre-requisite: PHR 3030.
UNIT NO: PHR 4311*  UNIT TITLE: MEDICINAL CHEMISTRY III

TYPE
Lectures and seminars

NUMBER OF ECTS: 4

LEARNING OBJECTIVES
To reinforce, extend and integrate the knowledge and understanding of the underlying concepts principles and methods of drug design introduced in PHR2026 Medicinal Chemistry I and PHR 3205 Pharmaceutical Analysis and Medicinal Chemistry II

CONTENT
The Discovery, Design and Development, including Structure-Activity Relationships (SAR) and where relevant, the pro-drug approach as an integral part of the drug design process, of the following:
Drugs used in musculoskeletal and joint disease, including non-steroidal anti-inflammatory drugs (NSAIDS), disease modifying anti-rheumatic drugs (DMARDS), selective inhibitors of cyclo-oxygenase -2 (Cox -2 inhibitors).
Opioid Analgesics.
Drugs used in diabetes, including insulins and antidiabetic agents.
Drugs used in Parkinsonism and related disorders.
Phenytoin and other antiepileptics.
Other drug classes : catecholamines, anti-virals
Steroid biosynthesis, SAR, stereochemical considerations and nomenclature.
The development of drugs based on structural modifications to endogenous peptides: DNA recombinant drugs, e.g., human insulin, human growth hormone.
An overview of anti-cancer drugs with special reference to the structural modalities that make them effective at their particular targets.

Seminars on pain, NSAIDS toxicity and NSAID pro-drug, human growth hormone.

ASSESSMENT
Exam of 3 hours held at the end of the second semester.

RESULT
Percentage mark and grade

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

*Pre-requisites: PHR 1026, PHR 2026, PHR 3205 and CHE 3141.
UNIT CODE: PHR 4110  UNIT TITLE: THE PHARMACIST IN SOCIETY

TYPE
Lectures, seminars and tutorials

NUMBER OF ECTS CREDITS: 2

LEARNING OBJECTIVES
To familiarize the student with the laws and regulations relating to pharmacy in Malta
To become aware of the ethical dimension of the various activities in the area of pharmacy practice.
To provide a sound understanding of the principles underlying European and Maltese legislation relating to medicines regulation
To make students aware of the importance of regulation and its implications
To understand issues relating to the market authorisation of medicinal products and their post market surveillance
To understand how pharmacies, distributors and manufacturers of medicinal products are inspected

CONTENT
Pharmacy laws: Health Care Professions Act, Medicines Act.
Duties and obligations
Other general rules: General duties and obligations
Duty to the public, General obligations, Specific duties, Other general duties, Registers to be kept by managing apothecary, Stocks of medicine, Security of medicines
Dispensing of medicines: General disposition: prescription writing, labelling;
Specific provisions as regards poisons and narcotics: dispensing (The Dangerous Drugs Ordinance, Restricted drugs,
Summarized rules for the control of dangerous drugs
Ethics, Law and the Pharmacy Profession
Pharmacist-patient relationships
Inter and intra-professional relationships
Ethics in research
Ethics and the pharmaceutical industry
Introduction to pharmaceutical regulatory affairs
An overview of global issues, different approaches to regulation, first and second wave markets
The European Union and free movement of goods: liberalisation of trade versus restriction and control
Medicines regulation:-placing a medicinal product on the market.
Good Manufacturing Practice (GMP), Good Distribution Practice (GDP) and Good Clinical Practice (GCP)
The rational use of medicinal products in terms of a regulatory framework
Pharmacovigilance and post marketing surveillance
National issues versus harmonization: current initiatives and developments in the regulatory field

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

RESULT
Percentage mark and grade

LECTURERS
Lilian M. Azzopardi (Co-ordinator)
Maryanne Ciappara
Lilian Wismayer
Anthony Serracino-Inglott
Sandra Mifsud Bonnici

READING LIST
- Laws of Malta for Pharmacy
Medicines Act of 2003
UNIT CODE: CPH 4020*  UNIT TITLE: PHARMACOLOGY G

TYPE
Lectures, seminars and practicals

NUMBER OF ECTS CREDITS: 8

LEARNING OBJECTIVES
I. To review the pharmacology of drugs used in anaesthesia and analgesia.
II. To expose the students to the various neurophysiological processes involved in addiction, depression and anxiolysis. To discuss the latest developments on the various pharmacological classes used to treat and control these processes including drugs of abuse, antidepressants, neuroleptics and sedative-hypnotics.
III. Clinical concepts in the application of PK/PD in optimising regimens for the individual patient.
IV. Computer aided learning sessions (PCAL) and problem based learning interactive sessions for the clinical applications of basic pharmacological principles.

This study unit will allow the students to provide a framework for the evaluation and interpretation of reports and medical literature, and the application of these principles to the selection of effective drug therapy, with the translation of pharmacological effect into an appropriate therapeutic effect. This unit will also provide the necessary tools, using evidence based medicine and problem based learning, for the students to correctly analyse the appropriate applications of any novel drugs, as they are introduced in clinical practice.

CONTENT
Drugs of abuse and addiction; drug administration, absorption and metabolism; tolerance, withdrawal and dependence; behavioural effects of psychoactive drugs.
Drug action: CNS depressants, stimulants, tricyclic antidepressants, hallucinogens, narcotics, volatile solvents, cannabis derivatives, designer drugs.
Animal research: reward pathway; treatment strategies.
Affective disorders; depression and bipolar disorders.
Monoamine hypothesis of depression; animal models of depression.
Antidepressant drugs: MAOIs, TCAs, SSRIs, novel drugs.
Other therapies: ECT, lithium.
Neuroleptics and schizophrenia.
Sedative hypnotics and anxiolytic drugs.
Barbiturates: mode of action, abuse, toxicity, tolerance and dependence.
Benzodiazepines: structure, mode of action, receptors clinical use.
Serotonergic drugs: 5HT receptor ligands.
General anaesthetics: mode of action, classification, pharmacokinetics and side effects.
Inhaled and injectable general anaesthetics.
Local anaesthetics: mode of action at cellular level, receptor modulation, classification, pharmacokinetics and side effects.
Opioid analgesics: classification, pharmacokinetics, side effects, tolerance.
Interpatient variation in clinical pharmacokinetic and population kinetics.
Therapeutic drug monitoring and computer software in clinical pharmacokinetics.
Stereoselectivity in pharmacokinetics.
PK/PD in clinical applications and in drug development and variable drugs.
PCAL Computer added packages:
Recombinant DNA Technology in clinical drug development.
Clinical application of choice of analgesics (NSAIDS, opioids, non opioids).
Clinical applications of drugs used in chronic respiratory and neurological disorders.
Analytical pharmacology and the interpretation of chromatographic data in clinical setting.
Clinical applications of drugs used in cardiovascular disorders and hypertension.
Problem based learning in clinical gastropharmacology, oncology and endocrine therapy.
ASSESSMENT
Written assignments and final integrated and synoptic examination of 3 hours held at the end of the fourth year.

RESULT
Percentage mark and grade

LECTURERS
Roger Ellul Micallef  Janet Mifsud
Frederick Fencech  Anthony Fenech
Charles Scerri  Doriette Soler
Mariella Zammit

READING LIST
- BRODY, LARNER, MINNEMAN. Human Pharmacology - Molecular to Clinical.
- MOSBY, HARDMAN, LIMBIRD, MOLINOFF, RUDDEN and GILMAN (Eds). Goodman and Gilman's The Pharmacological Basis of Therapeutics, Pergamon Press.
- LAURENCE AND BENNETT. Clinical Pharmacology. Churchill Livingston
- ROWLAND AND TOZER. Clinical Pharmacokinetics: concepts and applications. Lippincott, Williams & Wilkins.