

**FIRST YEAR  
INTAKE 2008  
(Academic Year 2008 -2009)**

**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

Participation at the yearly pharmacy symposium and discussion on the presentations

Practical experience in a community pharmacy: receiving of prescriptions and in the dispensing of medicines, in recording prescriptions, experience in recording purchases of narcotic and psychotropic drugs, in the application of laws and regulations relating to community pharmacy, application of accepted standards of professional conduct and practice, in the ordering, storage and stock control of medicines, in 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)  
Alision Anastasi  
Denise Ellul

Anthony Serracino Inglott  
Louise Azzopardi

## GENERAL BIBLIOGRAPHY FOR PHARMACY PRACTICE MODULE

- The British National Formulary. Pharmaceutical Press: London. latest edn.
- Medical Dictionary
- AZZOPARDI, L. Validation instruments for community pharmacy: Pharmaceutical care for the third millennium. 2000. Binghamton, USA: Pharmaceutical Products Press.
- MARTINDALE, W. The Extra Pharmacopoeia,. Pharmaceutical Press: UK
- ASHP. Medication Teaching Manual: The Guide to Patient Information. Bethesda: ASHP. latest edn
- Monthly Index of Medical Specialties (MIMS) Haymarket Medical Ltd: London (latest edn)
- Royal Pharmaceutical Society of Great Britain. Medicines, ethics and practice - a guide for pharmacists. RPSGB: London. latest ed.
- Code of Ethics, Pharmacy Board, Malta.
- ABPI: Data Sheet Compendium, Walker G. Datapharm Publication: UK (latest ed.)
- MACARTHUR D. The growing influence of the pharmacist in Europe. 1995. London: Financial Times Pharmaceutical and Healthcare Publishing.
- ZAYED, H, MANNING, S. Primary Care: a profile of the major European Markets. 1995. London: Financial Times Pharmaceutical and Healthcare Publishing.

## READING LIST

- WINFIELD A.J., RICHARDS RME. Pharmaceutical Practice. 1998. Edinburgh: Churchill Livingstone.
- HENRY JA. The new guide to medicines and drugs. 4<sup>th</sup> ed. 1998. London: British Medical Association.
- STONE, P., CURTIS, S.J. Pharmacy Practice. 2002 London: Pharmaceutical Press
- SHARGEL, L. Pharmacy Review. 1989. Pennsylvania: John Wiley & Sons.
- BLENKINSOPP, A, PANTON, R, ANDERSON, C. Health Promotion for pharmacists. Oxford: Oxford University Press. 2002.
- MASON, P. Locum Pharmacy. 1998. London: Pharmaceutical Press.
- KNOWLTON, CH, PENNA, RP. Pharmaceutical Care. 1996. New York: Chapman & Hall.
- TINDALL, WN, BEARDSLEY, RS, KIMBERLIN CL. Communication skills in pharmacy practice. 1994. Pennsylvania: Lea & Febiger.
- BURNARD P. Counselling skills for health professionals. 1994. London: Chapman & Hall.
- KILEY, R. Medical information on the internet: a guide for health professionals. London: Churchill Livingstone. 2000.

\*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

Responsibility 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)

Sandra Mifsud Bonnici

Anthony Serracino-Inglott

Charles Vella

**READING LIST**

- Laws of Malta for Pharmacy

**UNIT CODE:** PHR 1102      **UNIT TITLE:** PHARMACEUTICAL CHEMISTRY

**TYPE**

Lectures

**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,  $t_{1/2}$ , 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. **Students should pass in each component.**

### RESULT

Percentage mark and grade

### LECTURERS

Claire Shoemake (Co-ordinator)

Victor Ferrito

### READING LIST

- COTTON FA, WILKINSON G. Advanced Inorganic Chemistry - A comprehensive Text, 5th r.e. Wiley John & Sons, Inc. 1988, ISBN 0-471-84997-9
- HART H, HART DJ, CRAIN LE. Organic Chemistry - A Short Course, 9th r.e. Houghton Mifflin Co., Boston, USA 1995, ISBN 0-395-70838-9
- LEMKE TL. Review of Organic Functional Groups: Introduction to Medicinal Organic Chemistry. 3rd r.e. Lea & Febiger 1991, ISBN 0-8121-1428-0
- SYKES P. A Guide Book to Mechanism in Organic Chemistry, 6th edn. Wiley John & Sons, Inc. 1986, ISBN 0-470-20663-2
- ATKINS. Physical Chemistry, 5th r.e., Oxford U.P., ISBN 0-198-55730-2
- BARROW GM. Physical Chemistry, 5th edn. McGraw-Hill, Inc. 1988, ISBN 0-07-003905-4. Solutions supplement, ISBN 0-07-003906-2
- CHRISTIAN GD. Analytical Chemistry, 5th r.e. Wiley John & Sons, Inc. 1994, ISBN 0-471-59761-9
- Florence AT, Attwood D. Physicochemical Principles of Pharmacy. Chapman & Hall 1988, ISBN 0-412-01831-4
- MARTIN AN, SWARBICK J, CAMMARATA A. Physical Chemistry, 3rd edn. Orbetter Lea & Febiger, Philadelphia 1983
- CLARKS. Isolation and Identification of Drugs. Pharmaceutical Press, London
- SILVERSTEIN RM, BASSLER G. Spectrophotometric Identification of Organic Compounds, 5th edn. Wiley John and Sons Inc., ISBN 0-471-63404-2
- SKOOG DA, WEST DM, HOLLER JF. Analytical Chemistry: An Introduction, 5th edn. Saunders College Publishing, ISBN 0-03-029924-1
- BECKETT AH, STENLAKE JB. Practical Pharmaceutical Chemistry, Part I & II, 4th edn. Humanities Press International, Inc., ISBN 0-485-11323-6
- The British Pharmacopoeia Vol. I & II. HMSO, ISBN 0-11-321543-6
- The European Pharmacopoeia. The Pharmaceutical Press, London
- CHRISTIAN GD. Analytical Chemistry, 5th edn. Wiley John & Sons, Inc., ISBN 0-471-59761-9
- The Pharmaceutical Codex (incorporating The British Pharmaceutical Codex), 11th edn. The Pharmaceutical Press 1979, ISBN 0-85369-129-0
- 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 pharmaceuticals

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**

- The British Pharmacopoeia Vols I & II. The Stationery Office. ISBN 0113222580.
- AULTON, M. *Pharmaceutics: The Science of Dosage Form Design*. 2001. Churchill Livingstone. ISBN 0443055173.
- COLLETT, D., AULTON, M. *Pharmaceutical Practice*. 1998. Churchill Livingstone. ISBN 044305729X.
- MARTIN, A., BUSTAMENTE, P., CHUN A.H.C. *Physical Pharmacy: Physical Chemical Principles in the Pharmaceutical Sciences*. 1993. Lea & Febiger. (4th edition). ISBN 0812114388.
- *Pharmaceutical Calculations* by H C Ansel and M J Stoklosa. Publishers- Lippincott, Williams and Wilkins, 11th Edition, ISBN 0-7817-3172-0

**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**

Lectures include:

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.

Students will also attend in groups at clinical sessions and will be asked to witness clinical terms through the case studies investigated.

**ASSESSMENT**

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

**RESULT**

Percentage mark and grade

**LECTURERS/DEMONSTRATORS**

Anthony Serracino-Ingloft (Co-ordinator)

Bernard Coleiro

Lilian M. Azzopardi

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**

- |                          |                               |                       |
|--------------------------|-------------------------------|-----------------------|
| <input type="checkbox"/> | Anatomy 2 hours written test  | 50% (first semester)  |
| <input type="checkbox"/> | Histology 1 hour written test | 50% (second semester) |

**RESULT**

Percentage mark and grade

**LECTURERS**

Michael Asciak

Melvin Danastasi

**READING LIST*****Anatomy:***

- Ellis, Harold, Clinical Anatomy
- Grant's Atlas of Anatomy.
- Last, R.J. Anatomy

***Histology:***

- Wheater 's Functional Histology A text & colour Atlas. Young, Lowe, Stevens, Heath.  
Publisher: Churchill Livingstone; 5Rev Ed edition (31 Mar 2006) ISBN-10: 044306850X

A more advanced textbook, better intended for reference use is:

- Basic Histology: text & atlas. Junqueira, Carneiro, Publisher: McGraw-Hill Publishing  
Co.; 11Rev Ed edition (30 April 2005) ISBN-10: 0071440917

**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**

- Bostock L. and Chandler S, The Core Course for A-Level, Stanley Thornes, The Bath Press, Avon, 1990.
- Shepperd J. A.H. and Chepperd C.J., Pure Maths for A Level, Hodder & Stoughton, 1983.

**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:**

- Berne & Levy, Principles of Physiology. 4<sup>th</sup> edition (2005). Mosby Publishers.

**Alternatives:**

- Stuart Ira Fox, Human Physiology. 9<sup>th</sup> edition (2005). McGraw-Hill.
- Seeley, Stephens and Tate. Anatomy and Physiology. 6<sup>th</sup> edition (2006). Academic Internet Publishers.

**Supplementary/Reference:**

- Roitt et al. Roitt's Essential Immunology. 11<sup>th</sup> edition (2006). Blackwell Publishers.
- Guyton & Hall. Textbook of Medical Physiology. 11<sup>th</sup> edition (2005). Saunders.

**UNIT CODE:** PAT 1322      **UNIT TITLE:** GENERAL AND  
PHARMACEUTICAL  
MICROBIOLOGY I

**TYPE**

Lectures

**NUMBER OF ECTS CREDITS:** 4**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.

**CONTENT**

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

**ASSESSMENT**

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

**RESULT**

Percentage mark and grade

**LECTURERS**

Paul Cuschieri (Co-ordinator)  
Anna McElhatton

Christopher Barbara

**READING LIST:**

- Medical Microbiology and Infection, Tom Elliott et al, 4<sup>th</sup> Ed, ISBN 1405129329, Blackwell
- Medical Microbiology, David Greenwood et al, 11<sup>th</sup> Ed, ISBN 0443102090, Churchill Livingstone
- Pharmaceutical Microbiology, W.B. Hugo and A.D. Russell, 7<sup>th</sup> Ed, 2007

**UNIT CODE:** PHR 1202      **UNIT TITLE:** PHARMACEUTICAL ANALYSIS & CALCULATIONS

**TYPE**

Lectures

**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

**READING LIST**

- COTTON FA, WILKINSON G. Advanced Inorganic Chemistry - A comprehensive Text, 5th r.e. Wiley John & Sons, Inc. 1988, ISBN 0-471-84997-9
- BARROW GM. Physical Chemistry, 5th edn. McGraw-Hill, Inc. 1988, ISBN 0-07-003905-4. Solutions supplement, ISBN 0-07-003906-2
- CHRISTIAN GD. Analytical Chemistry, 5th r.e. Wiley John & Sons, Inc. 1994, ISBN 0-471-59761-9
- Florence AT, Attwood D. Physicochemical Principles of Pharmacy. Chapman & Hall 1988, ISBN 0-412-01831-4
- MARTIN AN, SWARBICK J, CAMMARATA A. Physical Chemistry, 3rd edn. Orbetter Lea & Febiger, Philadelphia 1983
- SILVERSTEIN RM, BASSLER G. Spectrophotometric Identification of Organic Compounds, 5th edn. Wiley John and Sons Inc., ISBN 0-471-63404-2
- SKOOG DA, WEST DM, HOLLER JF. Analytical Chemistry: An Introduction, 5th edn. Saunders College Publishing, ISBN 0-03-029924-1
- BECKETT AH, STENLAKE JB. Practical Pharmaceutical Chemistry, Part I & II, 4th edn. Humanities Press International, Inc., ISBN 0-485-11323-6
- CHRISTIAN GD. Analytical Chemistry, 5th edn. Wiley John & Sons, Inc., ISBN 0-471-59761-9
- AHUJA S. Pharmaceutical Analysis, Chromatography in Molecular Biology and Biotechnology. Meyers R. ed. VCH publishers, New York
- PRICHARD E. Selecting the Method, Selecting the Equipment and Consumables in Quality Control in the Analytical Laboratory. John Wiley & Sons, Chichester (1997)
- FELTKAMP H. Trends in Drug Analysis - An Overview. Topics in Pharmaceutical Sciences. Breimer et al, eds. FIP, The Hague (1989)

**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:**

- Freund, J. E. and Simon, G. A. (1995) *Statistics – A First Course*, Prentice Hall Inc.
- Spiegel, M. R. (1979) *Schaum's Outline Series: Theory & Problems of Statistics* – McGraw-Hill
- Sander, D. (1995) *Statistics - A First Course* – McGraw-Hill
- Freund, J. E. and Simon, G. A. (1997) *Modern Elementary Statistics*, Prentice Hall Inc.
- Rees, D.G. (1989) *Essential Statistics – 2<sup>nd</sup> Edition*, Chapman and Hall
- Freund, J. E. (1981) *Statistics – A First Course – 3<sup>rd</sup> Edition*, Prentice Hall Inc.
- Johnson, R. (1981) *Elementary Statistics – 4<sup>th</sup> Edition*, Duxbury Press Boston

- Harper, W.M. (1991) *Statistics – 5<sup>th</sup> Edition*, M and E Handbook Series
- Gilbert, N. (1988) *Statistics – 2<sup>nd</sup> Edition*, Saunders College Publisher
- J.A. Ingram (1977) *Elementary Statistics*, Cummings Publishing Co.
- Alastair, C. and Wardlaw (1999) *Practical Statistics for experimental Biologists - 2<sup>nd</sup> Edition*, Wiley
- Campbell, R.C. (1989) *Statistics for Biologists - 3<sup>rd</sup> Edition*, Cambridge University Press
- Newbold, P. (1995) *Statistics for Business and Economics - 4<sup>th</sup> Edition*, Prentice Hall Inc.
- Barrow, M. (2001) *Statistics for Economics, Accounting and Business Studies*, Financial Times Prentice Hall Inc.
- Knapp, R. G. (1984) *Basic Statistics for Nurses - 2<sup>nd</sup> Edition*, Delmar
- Finkelstein, M. and Levin, B. (2001) *Statistics for Lawyers - 2<sup>nd</sup> Edition*, Springer

**UNIT CODE:** PHR 1026      **UNIT TITLE**      INTRODUCTION TO  
MEDICINAL CHEMISTRY

**TYPE**

Lectures, tutorials

**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.

**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**

- King FD, editor, Medicinal Chemistry Principles & Practice, 2<sup>nd</sup> ed., Cambridge (UK), The Royal Society of Chemistry 2002.
- Thomas G, Medicinal Chemistry An Introduction, 2<sup>nd</sup> ed., West Sussex (UK), Wiley 2004.
- Patrick, GL, An Introduction to Medicinal Chemistry, 2<sup>nd</sup> ed., Oxford (UK) Oxford University Press 2002.

**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**

- |  |     |
|--|-----|
| <input type="checkbox"/> Written test of 2.5 hours | 80% |
| <input type="checkbox"/> Assignment                | 20% |

**RESULT**

Percentage mark and grade

**LECTURER**

Tony Spiteri Staines

**READING LIST**

- Robert T. Grauer, Maryann Barber *Exploring Microsoft Office Professional 2000 Volume 1* Spiral-bound Prentice Hall; ISBN: 0130111090
- Gini Courter, Annette Marquis *Mastering MS-Office 2000 Professional Edition* ISBN: B0000667GA

**UNIT CODE:** LIN 1081**UNIT TITLE:** IT-THADDIM TAL-MALTI GHALL-ISPIŻJARA**TYPE**

Lectures

**NUMBER OF ECTS CREDITS:** 2**CONTENT**

F'dan il-kors immissu r-registru tal-farmakoloġija, b'mod partikolari t-terminoloġija mhux-teknika tal-professjoi ta' l-ispiżjara. Niĥarrġu wkoll fis-sengħa tat-taħdit u tal-kitba fid-dawl ta' l-eżiġenzi ta' l-ispiżjara waqt il-qadi ta' xogħolhom. Il-kors fih komponent ta' ortografija, grammatika u stilistika tal-Malti.

**ASSESSMENT**

- |                          |                |     |
|--------------------------|----------------|-----|
| <input type="checkbox"/> | Test           | 60% |
| <input type="checkbox"/> | Tema assenjata | 40% |

**RESULT**

Marka u Grad

**LECTURER**

Michael Spagnol

**READING LIST:****Qari rrakkomandat**

- Akkademja tal-Malti. 2004. *Tagħrif fuq il-Kitba Maltija II*. Malta.
- Azzopardi, Carmel. 2003. *Gwida għall-Ortografija*. Malta.
- Bowman, W.C., Anne Bowman u Alison Bowman. 1986. *Dictionary of Pharmacology*. Oxford: Blackwell Scientific.
- Cassar, Mario. 2000. *Ir-Reqqa tal-Kitba*. Malta.
- Grabe, William u Robert B. Kaplan. 1996. *Theory & Practice of Writing*. Londra: Longman.

**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:**

- Freund, J. E. and Simon, G. A. (1995) *Statistics – A First Course*, Prentice Hall Inc.
- Spiegel, M. R. (1979) *Schaum's Outline Series: Theory & Problems of Statistics* – McGraw-Hill
- Sander, D. (1995) *Statistics - A First Course* – McGraw-Hill
- Freund, J. E. and Simon, G. A. (1997) *Modern Elementary Statistics*, Prentice Hall Inc.
- Wardlaw, A. C. (1999) *Practical Statistics for Experimental Biologists - 2<sup>nd</sup> Edition*, Wiley
- Campbell, R. C. (1989) *Statistics for Biologists - 3<sup>rd</sup> Edition*, Cambridge University Press
- Newbold, P. (1995) *Statistics for Business and Economics - 4<sup>th</sup> Edition*, Prentice Hall Inc.

- Barrow, M. (2001) *Statistics for Economics, Accounting and Business Studies*, Financial Times Prentice Hall Inc.
- Knapp, R. G. (1984) *Basic Statistics for Nurses - 2<sup>nd</sup> Edition*, Delmar
- Finkelstein, M. and Levin, B. (2001) *Statistics for Lawyers - 2<sup>nd</sup> Edition*, Springer

\* *Pre-requisite: SOR 0210 or equivalent.*

**UNIT CODE:** PHR 1120      **UNIT TITLE:** PHARMACY SPECIAL TOPICS I

**TYPE**

Practicals, seminars, tutorials and fieldwork

**NUMBER OF ECTS CREDITS:** 2

**LEARNING OBJECTIVES**

To introduce students to special topics dealing with pharmacy as it is developing today.

**CONTENT**

Students will be assigned special topics in pharmacy which will introduce the students to recent aspects of development in pharmacy. A number of the projects will be based on field assignments.

**ASSESSMENT**

Assignment

**RESULT**

Percentage mark and grade

**LECTURERS/DEMONSTRATORS**

Anthony Serracino Inglott (Co-ordinator)  
Lilian M. Azzopardi  
Lilian Wismayer  
Gordon Zammit

Maurice Zarb-Adami  
Imelda Serracino Inglott

**UNIT CODE:** PHR 1121      **UNIT TITLE**      STUDIES IN PHARMACEUTICAL SERVICES IN THE MIDDLE EAST

**TYPE**

Seminars, tutorials

**NUMBER OF ECTS CREDITS:** 2

**OFFERED IN SEMESTER 1 AND AGAIN IN SEMESTER 2**

**LEARNING OBJECTIVES**

To familiarize students with the pharmaceutical aspects of the use of medicines in Middle Eastern countries and North African countries.

**CONTENT**

Students will have to concentrate on a specified country. The areas covered will include manufacturing, importation, registration, distribution aspects and health care aspects.

**ASSESSMENT**

Assignment

**RESULT**

Percentage mark and grade

**LECTURER**

Anthony Serracino-Inglott (Co-ordinator)

Maurice Zarb-Adami

Lilian Wismayer