

SUBJECT OUTLINE



Subject Name:

Pharmacology

Subject Code:

BIOP211

SECTION 1 – GENERAL INFORMATION

Award/s:	Total course credit points:	Level:
Bachelor of Health Science (Naturopathy)	128	Core 2 nd Year
Bachelor of Health Science (Acupuncture)	128	Core 3 rd Year
Bachelor of Health Science (Nutritional and Dietetic Medicine)	96	Core 2 nd Year
Bachelor of Complementary Medicine	48	Elective 3 rd year

Duration: 1 Semester

Subject Coordinator: Pankaj Gulati (Melbourne campus)

Subject is: Core or Elective as noted

Subject Credit Points: 2

Student Workload:

No. timetabled hours per week:	No. personal study hours per week:	Total hours per week:
3	2	5

Delivery Mode:

Face to face	Details:	2 hours lecture	1 hour tutorial
E-Learning	Details:	Narrated PowerPoint presentations Tutorial - Asynchronous tutor moderated discussion forum and activities Student handouts, web resources	
Intensive Delivery	Details:	Summer school – delivered over 5 weeks with 2 x 4 hour days per week, combination lecture and tutorial activities. Research assignment for intensive delivery is due to be uploaded by Sunday on Week 3 of the Summer School period. Drug Monograph for intensive delivery is due to be uploaded by Sunday on Week 5 of the Summer School period. Final exam is conducted in Week 6 of summer school.	
Full Time			
Part Time			

Pre-requisites: BIOH122 and SOCQ121

Co-requisites: BIOC211

SECTION 2 – ACADEMIC DETAILS

Subject Rationale

This subject introduces pharmaceutical drugs used in conventional medicine as a basis for understanding their impact on a patient's health and disease. Mechanism of action, pharmacodynamics and toxic effects are examined for different classes of drugs in treating disease, the way the body works on the drugs and the dynamic way drugs work on the body. Drug interactions are also studied for their importance in clinical practice as well as a prelude to understanding herb-drug-nutrient interactions that can occur with traditional medicines.

Learning Outcomes

1. Identify and analyse the principles underpinning pharmacology, pharmacodynamics and pharmacokinetics, and how these principles affect western medical treatment and determine therapeutic dosage.
2. Propose mechanisms for the potential adverse effects and possible interactions of conventional drug treatments.

3. Discuss common drug classes, actions, main adverse effects, indications or contraindications as applied to physiological systems within the body: immune, blood clotting, autonomic nervous, central nervous, cardiovascular, digestive, respiratory, endocrine and reproductive systems.
4. Discuss the development, safe use and monitoring of drug regimens in conventional disease treatment/management as compared with complementary healthcare
5. Compare and contrast the pharmacology of common drug classes and how these apply to physiological systems within the body and in disease conditions.
6. Identify and analyse the principles underpinning toxicology and illustrate what constitutes a toxic agent.

Assessment Tasks

Type	Learning Outcomes Assessed	Week Content Delivered	Week Due	Weighting
Research Assignment (1400 words)	1-6	1-5	Sunday following Week 7	30%
Abbreviated Drug Monograph (800 words) (contributes to preparation for final exam)	1-5	6-12	Sunday following Week 12	20%
Final Examination Multiple-choice questions, Short answer questions and extended responses (2 hours)	1-6	1-13	Final Exam Period	50%

Prescribed readings:

1. Bryant, B., & Knights, K. (2015). *Pharmacology for health professionals* (4th ed.). Chatswood, NSW: Elsevier. [ebook available]

Recommended readings:

1. Aldred, E. M. (2009). *Pharmacology: A handbook for complementary healthcare professionals*. Edinburgh, Scotland: Churchill Livingstone.
2. Bullock, S. (2017). *Fundamentals of pharmacology* (8th ed.). Frenchs Forrest, NSW: Pearson.
3. Klaassen, C. D., & Watkins, J. B. (Eds.). (2010). *Casarett and Doull's essentials of toxicology* (2nd ed.). New York, NY: McGraw Hill Medical.
4. MIMS Australia (2017). MIMS Online [Computer Software]. Retrieved from <https://www.mimsonline-com-au.ezproxy.endeavour.edu.au/Search/Search.aspx>
5. Murray, L., Daly, F., Little, M., & Cadogan, M. (2011). *Toxicology handbook*, (2nd ed.). Sydney: Churchill Livingstone Elsevier. [ebook available]
6. The Pharmaceutical Press (2017). Martindale: The complete drug reference [Computer Software]. Retrieved from <https://www-medicinescomplete-com.ezproxy.endeavour.edu.au/mc/martindale/current/>
7. Timberlake, K. C. (2015). *General, organic, and biological chemistry: Structures of life* (5th ed.). Harlow, UK: Pearson.
8. Tortora, G. J., & Derrickson, B. (2014). *Principles of anatomy and physiology* (14th ed.). Danvers, MA: Wiley.
9. Walker, B. R., Colledge, N. R., Ralston, S. H., & Penman, I. D. (Eds.). (2014). *Davidson's principles and practice of medicine* (22nd ed.). Edinburgh, Scotland: Churchill Livingstone Elsevier. [ebook available]

Subject Content		
Week	Lecture	Tutorial
1.	Introduction to Pharmacology Subject Outline/Subject Aims/Assessment/Teaching Resources <ul style="list-style-type: none"> • Drugs, medicines and health professionals • Pharmacotherapy • MIMS and Drug Monographs • Over the counter drugs and complementary therapies. • Legal and ethical foundations of pharmacotherapy 	Activities are developed to allow the students to explore relevant concepts and expand on lecture material. Activities also allow for practice assessment and immediate feedback. <ul style="list-style-type: none"> • Review Assignment requirements • Discussion Forums and Activities using LibGuides including MIMSONline, and Medicines Complete eBooks (<i>Herbal Medicines</i> and <i>Martindale: The complete drug reference</i>)
2.	Pharmacodynamics Pharmacokinetics and drug absorption Different routes of administration	Activities on factors of lifestyle that can affect drug dosing regimes including lifespan (pregnancy, children, elderly) and pharmacokinetics
3.	Pharmacokinetics and drug distribution, metabolism and excretion <ul style="list-style-type: none"> • Bioavailability • Drug distribution • Metabolism • Routes of excretion Pharmacokinetics & dosing regimens <ul style="list-style-type: none"> • Plasma concentration-time profile <ul style="list-style-type: none"> ○ Steady state, loading and maintenance dose, clearance, half-life and saturable metabolism Pharmacogenomics	Activities on adverse drug reactions (ADR) and drug interactions
4.	Principles and Mechanisms of Toxicology <ul style="list-style-type: none"> • Scope of Toxicology, Risk assessment, exposure, dose→response principles • Dose-response curves, uses and shapes including hormesis, threshold measures • Absorption, distribution and excretion of toxins • Biotransformation of xenobiotics • Toxicokinetics 	Students continue interactive and research activities Review of: <ul style="list-style-type: none"> • Cholinergic transmission • Noradrenergic transmission • Local hormones – inflammation and immune reactions
5.	Drugs affecting Micro-organisms <ul style="list-style-type: none"> • Principles of antibiotic treatment and resistance development by bacteria • Action of penicillin, cephalosporins, quinolones, macrolide antibiotics and tetracyclines • Actions of sulphonamide-trimethoprim combinations and retinoids • Antifungals - azole antifungals, Caspofungin, flucytosine and griseofulvin action on fungal infections, benefits and adverse effects • Anti-virals - viral replication and acyclovir and oseltamivir • Anti-retrovirals in the treatment of HIV 	<ul style="list-style-type: none"> • Activity on antimicrobial drugs in society. Compilation of a Drug Diary which students continue in their private study • Students practice use of MIMS manuals or other online Drug/Herb monographs
6.	Drugs affecting Body Defences	<ul style="list-style-type: none"> • Students develop tables or flow diagrams to determine the drug

	<ul style="list-style-type: none"> • Anti-inflammatory and immunosuppressant drugs • Mechanism of action of NSAIDS; multiple effects and adverse effects of aspirin • Effects and adverse effects of paracetamol; • Actions of corticosteroids 	treatments of rheumatoid arthritis and gout and add this information to the Drug Diary during private study
7.	<p>Drugs affecting the Reproductive Systems</p> <ul style="list-style-type: none"> • Contraceptives and their effects • Hormone replacement therapy; the risks and benefits of HRT • Selective oestrogen receptor modulators (SERMS) in treating post-menopausal symptoms • Bisphosphonates and SERMS and treatment of osteoporosis <p>Drugs used in Neoplastic Disease</p> <ul style="list-style-type: none"> • Cancer and action of cancer chemotherapy drugs • Cytotoxic agents (cyclophosphamide and methotrexate) • Chemotherapy agents (cisplatin, tamoxifen, cyproterone etc) <p>Adverse effects of chemotherapy agents</p>	<ul style="list-style-type: none"> • Students practice the use of MIMS manuals or other online Drug/Herb monographs to answer Case Study hormone replacement therapy, HRT, and activities on drugs affecting the Reproductive System and anti-neoplastic drugs • Students compile the Drug Diary and continue this during private study
<p>NON-TEACHING WEEK (note that make-up classes may be scheduled in this week)</p> <p>Semester 1 - This aligns with the week after Easter so it may fall between weeks 6 to 8.</p> <p>Semester 2 & Online students - The break week falls between Weeks 7 and 8.</p>		
8.	<p>Drugs affecting the Blood</p> <ul style="list-style-type: none"> • Warfarin - actions and adverse effects • Anti-platelet drugs and their actions <p>Drugs affecting the Gastrointestinal System</p> <ul style="list-style-type: none"> • Proton pump inhibitors and H₂-antagonists • Cytoprotective agents and antacids • Antispasmodics • Anti-emetics; dystonic reactions <p>Lipid lowering drugs</p> <ul style="list-style-type: none"> • The mode of action and other characteristics of drugs used to lower lipids in the body • The use of nicotinic acid in hyperlipidaemia 	<ul style="list-style-type: none"> • Students practice the use of MIMSonline and other online Drug/Herb monographs to answer Case Studies on , duodenal ulcer and activities on Drugs Affecting the Blood, Respiratory System and Gastrointestinal system • Students continue compilation of the Drug Diary and continue this during private study
9.	<p>Drugs affecting the Endocrine System</p> <ul style="list-style-type: none"> • Thyroid: Thyroxine (T4) and thioureas; iodine, iodides, β-blockers and radioactive iodine • Insulin, biguanides and sulfonylureas in the treatment of diabetes; • Acarbose, repaglanide and glitazones the new oral hypoglycemic agents • Corticosteroids • Glucocorticosteroids 	<ul style="list-style-type: none"> • Students do activities on actions of corticosteroids and paracetamol and other Drugs Affecting the Endocrine System • Students continue compilation of the Drug Diary and continue this during private study
10.	<p>Drugs affecting the Peripheral Nervous System</p> <p>Neurotransmitters and their antagonists in the PNS:</p> <ul style="list-style-type: none"> • Review neurotransmitters involved in both the SNS and PNS, their receptors and involvement in physiological responses • Anti-muscarinic drugs and their effects • Adrenergic and anti-adrenergic drugs and their effects • Anti-Acetylcholinesterase drugs 	<ul style="list-style-type: none"> • Students problem-solve, case studies involving drugs affecting the peripheral nervous system • Students continue compilation of the Drug Diary and continue this in their private study

11.	Drugs affecting the Central Nervous System <ul style="list-style-type: none"> • Benzodiazepines and treatment of anxiety and insomnia • MAO-inhibitors, SSRIs, TCAs – and the treatment of depression • Lithium and the treatment of bipolar disorder and mania • Anti-epileptic drugs • Anti-psychotics in the treatment of schizophrenia • Levodopa-carbidopa in the relief of Parkinson’s symptoms • CNS depressants and their effects 	<ul style="list-style-type: none"> • Students research the effects of alcohol across body systems and Drugs Affecting the CNS • Students continue compilation of the Drug Diary and continue this in their private study
12.	Drugs affecting the Central Nervous System <ul style="list-style-type: none"> • Review the CNS function and neurotransmitters • Endogenous substances involved in pain • Treatment of pain with opioid analgesics • Opioid antagonists Non-opioid analgesics, (paracetamol)	<ul style="list-style-type: none"> • Students complete interactive activity on migraines and tension headaches and Drugs Affecting the CNS • Students compile the Drug Diary and continue this in their private study
13.	Drugs affecting the Cardiovascular System <ul style="list-style-type: none"> • Anti-hypertensives and their mode of action • Anti-anginal drugs and their mode of action • The mode of action and important features of drugs used to manage heart disease Drugs affecting the Respiratory System <ul style="list-style-type: none"> • Asthma drugs • Anti-tussives, expectorants, mucolytics and decongestants • Anti-histamines 	<ul style="list-style-type: none"> • Students practice the use of MIMS manuals or other online Drug and Herb monographs to answer Case Study Heart Failure and activities on Drugs Affecting the Cardiovascular System • Students compile a Drug Diary and continue this in their private study
14.	Non-Teaching Week / Practical Exam Week 1. Note that make-up classes may be scheduled in this week.	
15.	Non-Teaching Week / Practical Exam Week 2. Note that make-up classes may be scheduled in this week.	
16.	Final Exam Week 1 On campus enrolled students: please refer to the Exam Timetable for your local campus for the exact day and time of exam. Online enrolled students: You are required to sit examinations on campus per the Examination Policy - Higher Education . The Exam Week for subjects offered online is identified in the Online Calendar.	
17.	Final Exam Week 2 Please refer to the Exam Timetable for your local campus for the exact day and time of exam.	