FACULTY OF PHARMACY

UNDERGRADUATE GUIDEBOOK

2020/2021 SESSION

Welcoming Message from Dean

Welcome to the Faculty of Pharmacy, Universiti Malaya!

Congratulations on being selected to be part of us, a top 60 University in the QS World University Ranking!

Well done for choosing the right career path, the most diverse profession in the healthcare sector! Pharmacists practice in a variety of areas including hospitals, communities, industries and regulatory. The four-year program will equip you for a professional career enabling you providing pharmaceutical care to the nation.

I hope you will be motivated throughout the four years and turn to become an inspiring world-class pharmacist with the highest integrity, interpersonal skills and leadership qualities. In this challenging era, academic distinction must be at par with extracurricular performance to be a competitive individual and the endeavours for excellence should continue at the workplace.

Lastly, the faculty is committed to the provision and delivery of the best services to you through efficient management and relentless determination in continuous quality improvement of every aspect of our venture.

Keep your flag flying high and be an asset to society.

Thank you and Welcome on Board.

Assoc. Prof. Dr. Hasniza Zaman Huri
Dean
Faculty of Pharmacy
University of Malaya

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VISION, MISSION AND OBJECTIVES

Vision

To be a centre of excellence for pharmacy teaching and research.

Mission

To provide an overall and "broad-based" programme to give opportunity for specialisation and effective evidence-based practice. It is characterised by dynamics and forward-thinking.

Objectives

The objective of the Pharmacy programme is to produce pharmacists who are competent, possess professional skill together with high ethical standards and are well trained in delivery of Pharmaceutical Care as well as:

- To produce competent pharmacists capable of delivering quality pharmaceutical care that promotes positive health outcomes while functioning actively as healthcare team professional
- To be intellectually motivated to embrace lifelong learning
- To inculcate a spirit of respect for diversity and good citizenship

Academic Session 2020/2021 Calendar

SEMESTER I		
Orientation Week	1 Week	04.10.2020 – 11.10.2020
Lectures	5 Weeks	12.10.2020 – 15.11.2020
Mid Semester Break I	1 Week	16.11.2020 – 22.11.2020
Lectures	9 Weeks	23.11.2020 – 24.01.2021
Examination Semester I	3 Weeks	25.01.2021 – 14.02.2021
Semester Break	3 Weeks	15.02.2021 – 07.03.2021
	22 Weeks	

SEMESTER II		
Lectures	10 Weeks	08.03.2021 – 16.05.2021
Mid Semester Break II	1 Week	17.05.2021 – 23.05.2021
Lectures	4 Weeks	24.05.2021 – 20.06.2021
Revision Week	1 Weeks	21.06.2021 – 27.06.2021
Examination Semester II	3 Weeks	28.06.2021 – 18.07.2021
	19 Weeks	

SEMESTER BREAK		
Semester Break	11 Weeks	19.07.2021 – 03.10.2021

SPECIAL SEMESTER		
Lectures	7 Weeks	26.07.2021 – 12.09.2021
Examination Special Semester	1 Week	13.09.2021 – 19.09.2021
Special Semester Break	2 Weeks	20.09.2021 – 03.10.2021
	10 Weeks	

Public Holiday (Malaysia)

National Day	31 August 2020	Chinese New Year	12 & 13 February 2021
Malaysia Day	16 September 2020	Nuzul Al-Quran	29 April 2021
Prophet Muhammad S.A.W. Birthday	29 October 2020	Labour Day	1 May 2021
Deepavali	14 November 2020	Eid Al-Fitr	13 & 14 May 2021
Christmas Day	25 December 2020	Wesak Day	26 May 2021
New Year's Day	1 January 2021	Agong Birthday	7 June 2021
Thaipusam	28 January 2021	Eid Al-Adha	20 July 2021
Federal Territory Day	1 February 2021	Maal Hijrah	10 August 2021
		National Day	31 August 2021

Programme Title, Philosophy, Principles and Outcomes

Programme Title

Title of the conferred degree: Bachelor of Pharmacy (Hons)

Programme Philosophy

The Bachelor of Pharmacy (Hons) degree programme that is offered by the University of Malaya holds true to the following philosophy, which is in line with the nation's requirements:

- *The programme offers a broad-based curriculum and training with opportunities for specialisation. The programme supports evidence-based practices and consists of dynamic characteristics with room for future advancement.*

Programme Principles

In line with the programme philosophy, the programme offered is based on the following principles:

- The basic training given is broad-based and encompasses all aspects of the pharmacy practice, from pharmaceutical sciences to its application in the field of clinical pharmacy.
- The programme utilises interactive teaching methods and incorporates evidence-based practices in an effort to promote critical thinking and analysis in all the taught disciplines.
- The education provided is dynamic and farsighted to equip the graduates to face current and future challenges.
- Emphasis is given on basic communication and thinking skills as well as the benefits of modern communication technology.
- The training encompasses the importance of patient/customer-oriented therapy as well as uses a multi-disciplinary approach to deliver effective and efficient healthcare services.

Programme Outcomes

The following are the programme outcomes where at the end of the programme the students are able to:

PO1: Master in-depth and accurate knowledge towards current and future needs in all the areas of pharmacy.

PO2: Formulate, analyse, manufacture medicines and resolve issues of pharmaceutical care.

PO3: Demonstrate a responsible attitude and ability to interact courteously with members of the community.

PO4: Act in a professional manner and with integrity in accordance with the Malaysian Pharmacy Code of Conduct.

PO5: Communicate and cooperate effectively as a team member of healthcare professionals and demonstrate strong leadership capabilities.

PO6: Apply pharmaceutical care skills to resolve health-related issues.

PO7: Apply information management skills, life-long learning to foster professional development.

PO8: Possess management and entrepreneurship skills in the various areas of pharmacy profession.

REQUIREMENTS FOR GRADUATION

1. The student shall fulfil the requirements for the programme of study, that is:
   a) achieves a final CGPA of 2.00 and above;
   b) completes the number of credits as prescribed for his programme of study;
   c) fulfils the Faculty's requirements (if any) where he registered for his programme of study;
   d) fulfils the language requirements as prescribed; and
   e) fulfils the other requirements approved by the Senate from time to time.

2. Minimum credit requirements:
   a) The total credits required for the purpose of graduation is at least two thirds (2/3) of the total overall credits for the programme of study and shall be obtained through courses conducted by the University except for professional programmes which are administered by the respective professional bodies.
   b) The above requirements may be waived where the University has special regulations with another university or institution, for example under a letter of understanding or memorandum of understanding with regard to the admission of students from that institution to the University to continue with his programme of study.

3. Minimum duration requirements for study:
   a) A student shall complete the minimum duration of study that has been prescribed for his programme of study for the purpose of graduation except as otherwise provided under Regulations 18(3) and (4) of these Regulations.

4. Conferment of Bachelor's Degree With Honours
   a) A student may be awarded a degree once he has fulfilled the requirements of his programme of study.
   b) The degree awarded is an honours degree based on the final CGPA. In order to qualify to be awarded a Pass With Honours degree, the student shall obtain a final CGPA of not less than 2.00.

5. Conferment of Bachelor's Degree With Honours (With Distinction)
   A student is qualified to be awarded with Bachelor's Degree of a Pass With Honours (With Distinction) if he:
   a) achieves a final CGPA of 3.70 and above;
   b) has never obtained grade F for any course throughout the duration of his programme of study;
   c) has never repeated any course where he failed and/or upgraded his course grade; and
   d) has successfully completed his programme of study within the minimum duration or approved duration.

ACADEMIC PROGRAMME

PROGRAMME STRUCTURE

Category	Courses Code	Course Name	Credits
University Courses	GIG 1012	*Philosophy and Current Issue* *Falsafah dan Isu Semasa (FIS)*	2
	GIG1013	Appreciation of Ethics and Civilisation *Penghayatan Etika dan Peradaban (PEP)*	2
	GIG 1003	Basics of Entrepreneurship Culture *Asas Pembudayaan Keusahawanan*	2
	GIG 1004	Information Literacy *Literasi Maklumat*	2
	GIG 1005	Social Enggagement *Jalinan Masyarakat*	2
	GLT XXXX	English for Communication Programme *Program Bahasa Inggeris Komunikasi*	6
	GKX XXXX	Co-Curriculum Course *Kursus Ko-Kurikulum*	2
		Faculty's External Elective Courses *Kursus Elektif Luar Fakulti (KELF)*	4
		Total	**22**
Core Courses		Programme Core Courses *Kursus Teras Program*	99
Elective Courses		Faculty Elective Courses *Kursus Elektif Fakulti*	7
		Programme Elective Courses *Kursus Elektif Program*	10
		Grand Total	**138**

COURSE STRUCTURE

Year 1 (2020/2021)

Semester I

Category	Course Code	Course Name	Credits
University Courses	GIG1012	Philosophy and Current Issue	2
	GLTXXXX	English for Communication Programme	3
Core Courses	OIA1001	Basic Pharmaceutical Chemistry	3
	OIA1002	Pharmaceutical Organic Chemistry	3
	OIA1003	Biochemistry	3
	OIA1004	Anatomy and Physiology	3
	OIA1005	Introduction to Pharmacy	2

Total Credit Hours: 19

Semester II

Category	Course Code	Course Name	Credits
University Courses	GIG1013	Appreciation of Ethics and Civilisation	2
	GIG1004	Information Skills	2
	GIG1005	Social Engagement	2
	GLTXXXX	English for Communication Programme	3
Core Courses	OIA1006	Drug Action and Discovery	3
	OIA1007	Microbiology and Parasitology	2
	OIA1008	Physical Pharmacy	3
	OIA1009	Pharmacotherapy for EENT and Haematological Disorders	2

Total Credit Hours: 19

YEAR 1 TOTAL CREDIT HOURS: 38

Year 2 (2021/2022)

Semester I

Category	Course Code	Course Name	Credits
University Courses	GIG1003	Basics of Entrepreneurship Culture	**2**
		Faculty's External Elective Courses (KELF)	4
Core Courses	OIA2001	Medicinal Chemistry	2
	OIA2002	Pharmaceutical Analysis	3
	OIA2003	Pharmaceutical Dosage Form Design for Liquids and Semi-solids	2
	OIA2004	Pharmacotherapy for Gastrointestinal and Respiratory Disorders	3
	OIA2005	Pharmacotherapy for Infectious Diseases I	2

Total Credit Hours: 18

Semester II

Category	Course Code	Course Name	Credits
University Courses Elective Course	GKXXXXX	Co-curriculum Course	2
		Faculty Elective Course*	2
Core Courses	OIA2006	Chromatography, Electrochemistry and Radiochemistry	2
	OIA2007	Pharmacognosy	2
	OIA2008	Sterile Pharmaceutical Dosage Form Design	2
	OIA2009	Basic Immunology and Pharmacotherapy for Immune Disorders	2
	OIA2010	Pharmacotherapy for Infectious Diseases II	2
	OIA2011	Pharmacotherapy for Cardiovascular Disorders	3

Total Credit Hours: 17

YEAR 2 TOTAL CREDIT HOURS: 35

Year 3 (2022/2023)

Semester I

Category	Course Code	Course Name	Credits
Elective Course		Programme Elective Course**	2
Core Courses	OIA3001	Solid Pharmaceutical Dosage Form Design	3
	OIA3003	Extemporaneous Preparations	2
	OIA3004	Principles and Applications of Pharmacokinetics	2
	OIA3005	Pharmacotherapy for Endocrine Disorders	3
	OIA3006	Anaesthesia and Pharmacotherapy for Neurological Disorders	2
	OIA3007	Biostatistics and Epidemiology	2
	OIA3008	Management Skills for Pharmacists	2

Total Credit Hours: 18

Semester II

Category	Course Code	Course Name	Credits
Elective Courses		Faculty Elective Course*	2
		Programme Elective Courses**	4
Core Courses	OIA3010	Advanced Pharmaceutical Dosage Form Design	3
	OIA3011	Pharmacotherapy for Cancer, Pain and Renal Disorders	2
	OIA3012	Pharmacotherapy for Psychiatric Disorders	2
	OIA3014	Evidence-based Pharmacotherapy	2
	OIA3015	Pharmacy Ethics and Legislation	2

Total Credit Hours: 17

YEAR 3 TOTAL CREDIT HOURS: 35

Year 4 (2023/2024)

Semester I

Category	Course Code	Course Name	Credits
Elective Course		Programme Elective Courses**	4
	OIA4001	Pharmaceutical Quality Assurance	2
	OIA4002	Pharmacoeconomics	2
	OIA4004	Hospital and Community Pharmacy Practice	3
	OIA4005	Clinical Clerkship I	2
	OIA4006	Research Methodology	2

Total Credit Hours: 15

Semester II

Category	Course Code	Course Name	Credits
Elective Course		Faculty Elective Course*	3
Core Courses	OIA3016	Professional Pharmacy Attachment	2
	OIA4007	Industrial Pharmacy and Regulatory Control	2
	OIA4008	Clinical Clerkship II	2
	OIA4009	Research Project	6

Total Credit Hours: 15

YEAR 4 TOTAL CREDIT HOURS: 30

Faculty Elective Courses *

Course Code	Course Name	Credits
MIX1004	Introduction to Radiation Protection	2
MIX2001	Applications in Biomedical Science	2
MIX2002	Behavioral Science	2
MIX3001	Techniques in Molecular Medicine	2
MIX3002	Drugs: From Target to Market	2
MIX4001	Introduction to Qualitative Research	3

Programme Elective Courses **

Course Code	Course Name	Credits
OIA3017	Pharmaceutical Product Development	2
OIA3018	Veterinary Pharmacy	2
OIA3019	Drug Literacy	2
OIA3021	Pharmaceutical Biotechnology	2
OIA3022	Clinical Toxicology	2
OIA4010	Pharmacotherapy for Special Populations	2

COURSE SUMMARY

OIA1001: Basic Pharmaceutical Chemistry (3 credits)

Learning Outcomes

At the end of this course, students are able to:

1) describe the states of matter.
2) explain the principles associated with gases, liquids, solids, and solutions.
3) apply the concept of thermodynamics and kinetics in pharmacy.

Course Synopsis

This is an introductory module to physical principles that are applied in pharmaceutical sciences. This module emphasises on the importance of physical and chemical properties related to drugs and their dosage forms.

Reference Texts

1) Aulton, M.E., & Taylor, K.M. (2001). Pharmaceutics: The Science of Dosage Form Design (2nd ed.). Churchill Livingstone, UK.
2) Chang, R. (2005). Chemistry (8th ed.). McGraw Hill, New York.
3) Florence, A.T., & Attwood, D. (2006). Physicochemical Principles of Pharmacy (4th ed.). Pharmaceutical Press, UK.
4) Martin, A.N., Sinko, P.J., & Singh Yashveer (2011). Martin's physical pharmacy and pharmaceutical sciences: Physical Chemical and Biopharmaceutical Principles in The Pharmaceutical Sciences (6th ed.) Lippincott Williams and Wilkins, USA.
5) Beckett, A.H., & Stenlake, J.B. (2001). Practical Pharmaceutical Chemistry, Vol. 1 & 2 (4th ed.). Bloomsbury Academic, UK.

Course Assessment

Course will be assessed by Continuous Assessment 40% and a Final Examination 60%.

OIA1002: Pharmaceutical Organic Chemistry (3 credits)

Learning Outcomes

At the end of this course, students are able to:

1) state the functional groups, organic reactions, names, and structures of organic compounds.
2) explain how organic structures and bonds influence physical and chemical properties of a compound.
3) identify chemical substances in drugs and pharmaceutical usage.

Course Synopsis

The module describes a general view on the organic chemistry aspects to determine drug characters, which are important in pharmaceutical analyses and drug actions.

Reference Texts

1) McMurry, J. (2012). Organic Chemistry (8th ed.). Thomson-Brooks/Cole, USA.
2) Lemke, T.L., Roche, V.F., & Zito, S.W. (2011). Review of Organic Functional Groups. Introduction to Medicinal Organic Chemistry (5th ed.). Lippincott Williams & Wilkins, USA.
3) Barber, J., & Rostron, C. (2013). Pharmaceutical Chemistry. Oxford University Press, UK.

Course Assessment

Course will be assessed by Continuous Assessment 40% and a Final Examination 60%.

OIA1003: Biochemistry (3 credits)

Learning Outcomes

At the end of the course the students are able to:

1) identify and explain the system of cell biology.
2) describe the chemical classification and metabolism of carbohydrates, lipids, amino acids, peptides, and proteins.
3) analyse the system bioenergetics, enzymes, vitamins and nucleic acids.
4) interrelate metabolism in humans.
5) analyse disturbances in the mechanisms of the immune system in the body and identify the most suitable methods of treatment and medicines used.

Course Synopsis

This module provides the knowledge on the basic biochemical systems in the human body.

Reference Texts

1) Harvey, R., & Ferrier, D. (2011). Lippincott's Illustrated Reviews. Biochemistry (5th ed.). Lippincott Williams & Wilkins, USA.
2) Berg, J.M., Tymoczko, J.L., & Stryer, L. (2007). Biochemistry (6th ed.). W.H. Freeman and Company.
3) Devlin, T. (2002). Textbook of Biochemistry with Clinical Correlations (5th ed.).
4) Champe, P.C., & Harvey, R.A. (2008). Lippincott's Illustrated Reviews: Biochemistry (4th ed.) Lippincott Williams & Wilkins, USA.
5) Lehninger, A.L., Nelson, D.L., & Cox, M.M. (2003). Principles of Biochemistry (2nd ed.). Worth Publishers, New York.
6) Montgomery, R., Conway, T.W. & Spector, A.A. (2006). Biochemistry: A Case–oriented Approach (10th ed.) Mosby.

Course Assessment

Course will be assessed by Continuous Assessment 40% and a Final Examination 60%.

OIA1004: Anatomy and Physiology (3 credits)

Learning Outcomes

At the end of the course the students are able to:

1) describe the overall organization, function, and anatomy of the human body (cells, tissues, and organs).
2) outline the function and the importance of each of the following systems: endocrine, cardiovascular, lymphatic, digestive, urinary, reproductive, nervous, and respiratory systems.
3) discuss the fundamentals of homeostasis and its importance in regulating normal physiology.

Course Synopsis

Students will be exposed to the main anatomical and physiological systems in a human body after being introduced to the basic knowledge of physiology and anatomy.

Reference Texts

1) Tortora, G. J., & Bryan H. D. (2009). Principles of Human Anatomy and Physiology (12th ed.). John Wiley & Sons, Inc.
2) Sukkar, M.Y., El-Munshid, H.A., & Ardawi, M.S.M. (2000). Concise Human Physiology (2nd ed.). Blackwell Science.
3) Guyton. A.C., & Hall, J.E. (2011). Textbook of Medical Physiology (12th ed.). W.B. Saunders Co., USA.
4) Pocock, G., Richards, C.D., & Richards, D.A. (2013). Human Physiology. Oxford.
5) Barret, K.E., Barman, S.M., Boitano, S., & Brooks, H. (2012). Review of Medical Physiology (24th ed.). McGraw Hill.
6) Mohd Noor, N. (2014). Ilustrated Human Physiology. Pearson.

Course Assessment

Course will be assessed by Continuous Assessment 40% and a Final Examination 60%.

OIA1005: Introduction to Pharmacy (2 credits)

Learning Outcomes

At the end of the course students are able to:

1) describe the career spectrum of the pharmacy profession in Malaysia.
2) discuss the roles of a pharmacist in promoting good health and appropriate drug usage in the context of the Malaysian healthcare system.
3) identify current issues and challenges relating to the pharmacy profession.

Course Synopsis

This module introduces the history and development of pharmacy profession in Malaysia. The various fields of pharmacy and the roles of a pharmacist in each field will be described. Some sources of information related to pharmacy requirements and challenges related to this profession will be discussed.

Reference Texts

1) British National Formulary (BNF), British Medical Association, latest edition.
2) Lund, W. (1994). The Pharmaceutical Codex: Principles and Practice of Pharmaceutics (12th ed.). Pharmaceutical Press, London.
3) Martindale, W. The Extra Pharmacopoeia (Latest edition). Pharmaceutical Press, London.
4) Pharmacy Legislation of Malaysia, Malaysian Pharmaceutical Society.
5) Collett, D.M., & Aulton, M.E. (1990). Pharmaceutical Practice. Churchill Livingstone.

Course Assessment

Course will be assessed by Continuous Assessment 100%.

OIA1006: Drug Action and Discovery (3 credits)

Learning Outcomes

At the end of the course students are able to:

1) explain the principles of drug action based on the concepts of pharmacodynamics and pharmacokinetics.
2) discuss how the molecular structure and the physico-chemical properties of organic compounds affect drug action.
3) describe the strategies involved in drug discovery.

Course Synopsis

This module introduces the principles of drug action and how the physico-chemical properties of organic molecules underlie drug design and action.

Reference Texts

1) Katzung, B.G. (2004). Basic and Clinical Pharmacology (9th ed.). Appleton & Lange.
2) Rang, H.P., Dale, M.M., Ritter, J.M., & Moore, P.K. (2003). Pharmacology (5th ed.). Churchill Livingstone.
3) Patrick, K. (2002). Goodman & Gilman's The Pharmacological Basis of Therapeutics (10th ed.). McGraw-Hill.
4) Grahame-Smith, D.G., & Aronson, J.K. (2001). Clinical Pharmacology and Drug Therapy (3rd ed.). Oxford University Press.
5) Patrick, G.L. (2013). An Introduction to Medicinal Chemistry (5th ed.). Oxford University Press, United Kingdom.
6) King, F.D. (2003). Medicinal Chemistry: Principles and Practice (2nd ed.). Royal Society of Chemistry, United Kingdom.

Course Assessment

Course will be assessed by Continuous Assessment 40% and a Final Examination 60%.

OIA1007: Microbiology and Parasitology (2 credits)

Learning Outcomes

At the end of the course students are able to:

1) identify the basic microbiology and morphology of bacteria.
2) recognise the genetic, classification, reproduction, and importance of pathogenesis of microbial infections.
3) explain basic parasitology, structure, and classification of parasites.
4) demonstrate an understanding on the pathogenesis of parasitic infections and the mechanism of action of drugs against the parasites.

Course Synopsis

This module provides the knowledge on the various aspects of microbiology and parasitology including important parasites in Malaysia, epidemiology, brief life cycle, brief diagnosis, symptom and treatment and mechanism of action of drugs against different parasites. This module provides an opportunity to learn about aseptic, isolation and identification techniques of micro-organisms, and factors that affect its development.

Reference Texts

1) Hugo, W.B., & Russell, A.D. (2011). Pharmaceutical Microbiology (8th ed.). Blackwell Science.
2) Harvey, R.A. (2007). Microbiology. Lippincott Williams and Wilkins.
3) Kayser, F. H., Bienz, K.A., Eckert, J., & Zinkernagel, R.M. (2011). Medical Microbiology. Georg ThiemeVerlag.
4) Stratton, C.W. (2011). Clinical Microbiology: Quality in Laboratory Diagnosis. Demos Medical Publishing.
5) Matthews, B.E. (2007). Introduction to Parasitology (98th ed.). Cambridge University Press.
6) Bogitsh, B.J. (2012). Human Parasitology (4th ed.). Academic Press Inc.
7) Heelan, J.S., & Ingersoll, F.W. (2001). Essentials of Human Parasitology (2nd ed.). Delmar Publications.
8) John, D.T., & Petri, W.A. (2006). Markell and Voge's Medical Parasitology (9th ed.). W.B. Saunders Co.

Course Assessment

Course will be assessed by Continuous Assessment 40% and a Final Examination 60%.

OIA1008: Physical Pharmacy (3 credits)

Learning Outcomes

At the end of the course students are able to:

1) recognise the concept of the disperse systems, surface phenomena, micromeritics and rheology, and factors influencing stability of disperse systems.
2) describe the mechanism of action of surface active agents, rheology properties of pharmaceutical materials and the application of the disperse systems, surface phenomena, and micromeritics and rheology in pharmaceutical formulations.
3) determine the stability of disperse systems, critical micelle concentration, powder characteristics, and viscosity of pharmaceutical materials.

Course Synopsis

The module introduces the basic principles of physical pharmacy required in the pharmaceutical formulations. The physicochemical properties of pharmaceutical materials together with the methods to determine their properties are also included. Students will perform laboratory works that are related to the topics given in the lectures, namely disperse systems, surface properties, and micromeritics and rheology.

Reference Texts

1) Attwod, D., & Florence, A.T. (2008). Physical Pharmacy. Pharmaceutical Press, London.
2) Aulton, M.E (2001). Pharmaceutic: The Science of Dosage Form Design (2nd ed.). Churchill Livingston, Edinburg.
3) Martin, A.N., Sinko, P.J., & Singh, Y. (2011). Physical Pharmacy and Pharmaceutical Sciences: Physical Chemical and Biopharmaceutical Principles in the Pharmaceutical Sciences (6th ed.) Lippincott Williams & Wilkins, USA.
4) Gerbino, P.P. (2006). Remington: The Science and Practice of Pharmacy (21st ed.). Lippincot Williams & Wilkins, USA.
5) Roop, K.H., Vyas, S.P., Farhan, J.H., & Gaurav, K.J. (2013). Lachman/Liebeman: The Theory and Practice of Industrial pharmacy (4th ed.). CBS Publishers & Distributers, India.
6) British Pharmacopeia Commision. British Pharmacopeia 2014. General Medical Council (Great Britain), Great Britain: Medicines Commision.
7) The United States of Pharmacopeial Convention (2003). The United States of Pharmacopeia 27/The National Formulary 22: USP 27/ NF 22. Port City Press, Baltimore.

Course Assessment

Course will be assessed by Continuous Assessment 40% and a Final Examination 60%.

OIA1009: Pharmacotherapy for EENT and Haematological Disorders (2 credits)

Learning Outcomes

At the end of the course students are able to:

1) describe the mechanisms of drug interactions, adverse drug reactions, as well as the pathophysiology and management of eye, ear, nose and throat (EENT) and haematologic disorders.
2) explain the mechanisms of action, pharmacokinetic properties, adverse effects and drug interactions of drugs used in EENT and haematology disorders.
3) interpret laboratory test results with the principles of patient management.
4) solve pharmaceutical care issues for these disorders.

Course Synopsis

This module is designed to help students understand the mechanisms of drug interactions and adverse drug effects. The pathophysiology and management of fever, eye, ears, nose and throat (EENT), as well as haematologic disorders will also be emphasised.

Reference Texts

1) Katzung, B.G., Masters, S.B., & Trevor, A.J. (2012). Basic and Clinical Pharmacology (12th ed.) McGraw Hill.
2) Brunton, L., Chadner, B., & Knollman, B. (2011). Goodman and Gilman's The Pharmacological Basis of Therapeutics (12th ed). McGraw Hill.
3) Rang, H., & Dale, M. (2011). Pharmacology (7th ed.). Elsevier.
4) Dipiro, J.T., Talbert, R.L., Yee, G.C., & Matzke, G.R. (2014). Pharmacotherapy: A Pathophysiologic Approach (9th ed.). McGraw-Hill.
5) Herfindal, E.T., & Gourley, D.R. (2007). Textbooks of Therapeutics. Drug and Disease management (8th ed.). Lippincott Williams and Wilkins, USA.
6) Alldredge, B.K., Corelli, R.L., Ernst, M.E., Guglielmo, B.J., Jacobson, P.A., Kradjan, W.A., & Williams, B.R. (2013). Koda-Kimble and Young's Applied Therapeutics: The Clinical Use of Drugs (10th ed.). Lippincott Williams and Wilkins, USA.
7) British National Formulary (2015 or later edition).
8) Drug Information Handbook (2014 or later edition). Lexi-Comp's Clinical Reference Library.

Course Assessment

Course will be assessed by Continuous Assessment 40% and a Final Examination 60%.

OIA2001: Medicinal Chemistry (2 credits)

Learning Outcomes

At the end of the course students are able to:

1) explain the biological activity of the major drug classes.
2) describe the development of important drugs in the major drug classes and their structure-activity relationships.
3) predict the activity of analogues of important drugs based on their chemical structures.

Course Synopsis

This module deepens the understanding of the physicochemical concepts, which underlie drug design and action.

Reference Texts

1) Patrick, G.L. (2013). An Introduction to Medicinal Chemistry (5th ed.). Oxford University Press, United Kingdom.
2) Nogrady, T., & Weaver, D.F. (2005). Medicinal Chemistry: A Molecular and Biochemical Approach (3rd ed.). Oxford University Press, USA.

Course Assessment

Course will be assessed by Continuous Assessment 40% and a Final Examination 60%.

OIA2002: Pharmaceutical Analysis (3 credits)

Learning Outcomes

At the end of the course students are able to:

1) recognise the concept of monographs and pharmacopeia standard.
2) describe the principles of major analytical methods.
3) apply major analytical methods in structural determination and quality control.

Course Synopsis

The module introduces the principles and analytical technique of practice, which are used in drugs quality control, dosage form, and research and development.

Reference Texts

1) Watson, D. (2012) Pharmaceutical Analysis. Churchill Livingston, UK.
2) Pavia, D.L., Lampman, G.M., Kriz, G.S. and Vyvyan, J. A. (2009) Introduction to Spectroscopy (5th ed.). Saunders College Publishing, USA.
3) Moffat, A.C. (2011). Clarke's Analysis of Drugs and Poisons (4th ed.). Pharmaceutical Press, United Kingdom.
4) Sanders, J.K.M., Constable, E.C., Hunter, B.K. and Pearce, C.M. (1995). Modern NMR Spectroscopy (2nd ed.). Oxford University Press, Oxford.

Course Assessment

Course will be assessed by Continuous Assessment 40% and a Final Examination 60%.

OIA2003: Pharmaceutical Dosage Form Design for Liquids and Semi-solids (2 credits)

Learning Outcomes

At the end of the course students are able to:

1) recognise the concepts and the industrial manufacturing process of liquid and semi-solid dosage forms.
2) prepare liquid and semi-solid dosage forms in laboratory scale.
3) perform physical quality control evaluations for liquid and semi-solid dosage forms.

Course Synopsis

The module introduces to the students the overall concept on liquid and semi-solid dosage forms. Students will be introduced to equipment used in manufacturing of liquid and semi-solid dosage forms. Students will prepare liquid and semi-solid dosage forms in laboratory scale together with the evaluation for physical qualities.

Reference Texts

1) Attwod, D., & Florence, A.T. (2008). Physical Pharmacy. Pharmaceutical Press, London.
2) Aulton, M.E., & Taylor, K.M. (2001). Pharmaceutics: The Science of Dosage Form Design (2nd ed.). Churchill Livingstone, UK.
3) Martin, A.N., Sinko, P.J., & Singh, Y. (2011). Physical Pharmacy and Pharmaceutical Sciences: Physical Chemical and Biopharmaceutical Principles in the Pharmaceutical Sciences (6th ed.) Lippincott Williams & Wilkins, USA.
4) Gerbino, P.P. (2006). Remington: The Science and Practice of Pharmacy (21st ed.). Lippincot Williams & Wilkins, USA.
5) Roop, K.H., Vyas, S.P., Farhan, J.H., & Gaurav, K.J. (2013). Lachman/Liebeman: The Theory and Practice of Industrial pharmacy (4th ed.). CBS Publishers & Distributers, India.
6) The British Pharmacopeia Commision. The British Pharmacopeia 2014. General Medical Councel (Great Britain), Great Britain: Medicines Commision, 2014.
7) The United States of Pharmacopeial Convention (2003). The United States of Pharmacopeia 27/The National Formulary 22: USP 27/ NF 22. Port City Press, Baltimore.

Course Assessment

Course will be assessed by Continuous Assessment 40% and a Final Examination 60%.

OIA2004: Pharmacotherapy for Gastrointestinal and Respiratory System (3 credits)

Learning Outcomes

At the end of the course students are able to:

1) describe the pathophysiology and management of gastrointestinal and respiratory disorders.
2) explain the mechanisms of action, pharmacokinetic properties, adverse effects and drug interactions of drugs used in gastrointestinal and respiratory disorders.
3) interpret laboratory test results with the principles of patient management.
4) solve pharmaceutical care issues for these disorders.

Course Synopsis

This module is one of a series of modules that integrates the discipline of pharmacology and clinical pharmacy. In this module, pharmacology of gastrointestinal and respiratory drugs, and clinical management of gastrointestinal and respiratory disorders will be covered. Students will be introduced to the concept of management of various gastrointestinal and respiratory disorders such as peptic ulcer disease, hepatic disorders, inflammatory bowel disease, asthma, and chronic obstructive airway disease (COAD).

Reference Texts

1) Dipiro, J.T., Talbert, R.L., Yee, G.C., & Matzke, G.R. (2014). Pharmacotherapy: A Pathophysiologic Approach (9th ed.). McGraw-Hill.
2) Herfindal, E.T., & Gourley, D.R. (2006). Textbooks of Therapeutics. Drug and Disease management (8th ed.). Lippincott Williams and Wilkins.
3) Alldredge, B.K., Corelli, R.L., Ernst, M.E., Guglielmo, B.J., Jacobson, P.A., Kradjan, W.A., & Williams, B.R. (2013). Koda-Kimble and Young's Applied Therapeutics: The Clinical Use of Drugs (10th ed.). Lippincott Williams and Wilkins, USA.
4) Katzung, B.G. (2014). Basic and clinical pharmacology (13th ed.). Appleton & Lange.
5) Rang, H.P., & Dale, M.M. (2015). Pharmacology (8th ed.). Churchill Livingstone.
6) Brunton, L., Chadner, B., & Knollman, B. (2011). Goodman and Gilman's The Pharmacological Basis of Therapeutics (12th ed.). McGraw Hill.
7) British National Formulary (2016 or later edition).
8) Drug Information Handbook (2016 or later edition). Lexi-Comp's Clinical Reference Library.

Course Assessment

Course will be assessed by Continuous Assessment 40% and a Final Examination 60%.

OIA2005: Pharmacotherapy for Infectious Diseases I (2 credits)

Learning Outcomes

At the end of the course students are able to:

1) discuss the pathophysiology and management of infectious diseases of various organ systems, such as gastrointestinal, respiratory, urogenital, cardiovascular, and central nervous system.
2) explain the mechanisms of action, pharmacokinetic properties, adverse effects, and drug interactions of drugs used in infectious diseases.
3) interpret laboratory test results with the principles of patient management.
4) solve pharmaceutical care issues involving infectious diseases.

Course Synopsis

This module is one of the series of modules that integrates the discipline of pharmacology and clinical pharmacy. In this module, pharmacology of antimicrobials and clinical management of infectious diseases will be discussed. Students will be introduced to the concept of management of infectious diseases in various organ systems such as infections of the cardiovascular, respiratory, gastrointestinal, and central nervous system.

Reference Texts

1) Katzung, B., Masters, S., & Trevor, A. (2012). Basic and Clinical Pharmacology (12th ed.). McGraw Hill.
2) Brunton, L., Chadner, B., & Knollman, B. (2011). Goodman and Gilman's The Pharmacological Basis of Therapeutics (12th ed.). McGraw Hill.
3) Rang, H., & Dale, M. (2011). Rang and Dale Pharmacology (7th ed.). Elsevier.
4) Dipiro, J.T., Talbert, R.L., Yee, G.C., & Matzke, G.R. (2014). Pharmacotherapy: A Pathophysiologic Approach (9th ed.). McGraw-Hill.
5) Herfindal, E.T., & Gourley, D.R. (2006). Textbooks of Therapeutics. Drug and Disease management (8th ed.). Lippincott Williams and Wilkins.
6) Alldredge, B.K., Corelli, R.L., Ernst, M.E., Guglielmo, B.J., Jacobson, P.A., Kradjan, W.A., & Williams, B.R. (2013). Koda-Kimble and Young's Applied Therapeutics: The Clinical Use of Drugs (10th ed.). Lippincott Williams and Wilkins, USA.
7) British National Formulary (2014 or later edition).
8) Drug Information Handbook (2014 or later edition). Lexi-Comp's Clinical Reference Library.

Course Assessment

Course will be assessed by Continuous Assessment 40% and a Final Examination 60%.

OIA2006: Chromatography, Electrochemistry and Radiochemistry (2 credits)

Learning Outcomes

At the end of the course students are able to:

1) explain the use of the concepts of electrochemistry in pharmaceutical analysis.
2) apply the principles of chromatography.
3) apply the concepts of radiochemistry to pharmacy.

Course Synopsis

The module is the continuation of pharmaceutical analysis, to introduce the principles and analytical techniques, which are used in the quality control of drugs and their dosage forms and research and development.

Reference Texts

1) Poole, C.F. (2003). The Essence of Chromatography. Elsevier, Amsterdam.
2) Hahn-Deinstrop, E. (2007). Applied Thin-Layer Chromatography: Best Practice and Avoidance of Mistakes (2nd ed.). Wiley-VCH, Weinheim.
3) McNair, H.M., Miller, J.M. (2009). Basic Gas Chromatography (2nd ed.). John Wiley and Sons, New Jersey.
4) Snyder, L.R., Kirkland, J.J., & Dolan, J.W. (2010). Introduction to Modern Liquid Chromatography. (3rd ed.). Wiley, New Jersey.
5) Theobald, A.E., Sampson, C.B. (2011). Sampson's Textbook of Radiopharmacy. Pharmaceutical Press, London.
6) Wang, J. (2006) Analytical Electrochemistry. (3rd ed.). Wiley-VCH Publishers, USA.

Course Assessment

Course will be assessed by Continuous Assessment 40% and a Final Examination 60%.

OIA2007: Pharmacognosy (2 credits)

Learning Outcomes

At the end of the course students are able to:

1) relate the importance of bridging allopathic systems of medicine with traditional systems of medicine.
2) interpret the cell types, cell inclusions, and the metabolic pathways of secondary metabolite production in plants.
3) recognise the phytoconstituents with suitable examples and plants used in Homoeopathic, Chinese, Ayurvedic, and Malay systems of medicine.
4) demonstrate the methods of herbal drug evaluation and standardization.

Course Synopsis

This module provides the overview of potential natural sources of drugs and development of natural drugs in the form acceptable to allopathic system of medicine especially from plants. The relationship between the biogenetic pathways and pharmaceutically important secondary metabolites is explained. The module also emphasises on the concepts and techniques in standardization of plant drugs. Aspects on quality control are introduced. The effect of period of collection, method of storage, and processing on the quality of plant drugs will also be explained.

Reference Texts

1) Evans, W.C. (2009). Trease and Evans Pharmacognosy (16th ed.). Elsevier.
2) Heinrich, M., Barnes, J., Gibbons, S., & Williamson, E.M. (2004). Fundamentals of Pharmacognosy and Phytotherapy (1st ed.). Elsevier.
3) Wallis,T.E. (2005). Text Book of Pharmacognosy (5th ed.). Pitman Publishers, London, UK.

Course Assessment

Course will be assessed by Continuous Assessment 40% and a Final Examination 60%.

OIA2008: Sterile Pharmaceutical Dosage Form Design (2 credits)

Learning Outcomes

At the end of the course students are able to:

4) recognise the concept of sterile dosage forms, industrial manufacturing process, and process control of sterile dosage forms.
5) prepare sterile pharmaceutical dosage form extemporaneously using aseptic technique.
6) perform compendial and non-compendial quality control (QC) tests for sterile dosage forms.

Course Synopsis

Students will be introduced to the overall concept and calculations on sterile dosage forms. Students will be introduced to equipments used in the manufacturing and requirement of the manufacturing plant for sterile dosage forms. Students will be given the chance to use the equipment available for practicals in preparation of this dosage form. Students will do hands-on quality control tests and extemporaneous preparation of sterile dosage forms.

Reference Texts

1) Aulton, M.E., & Taylor, K.M. (2013). Aulton's Pharmaceutics: The Design and Manufacture of Medicines (4th ed.). Elsevier.
2) Remington: The Science and Practice of Pharmacy (22nd ed.). Mack Publishing Co. USA.
3) Allen, L.V., Popovich, N.G., & Ansel, H.C. (2011). Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems (9 th ed.). Lippincott Williams & Wilkins, USA.
4) Stationery Office (Great Britain). (2012). British Pharmacopoeia 2012. Stationery Office, London.
5) United States Pharmacopoeia 36-NF 31, 2012.
6) Lachman, L., Lieberman, H.A., & Kanig, J.L. (1986). The Theory and Practice of Industrial pharmacy (3 rd ed.). Lea & Febiger, Philadelphia, USA.

Course Assessment

Course will be assessed by Continuous Assessment 40% and a Final Examination 60%.

OIA2009: Basic Immunology and Pharmacotherapy for Immune Disorders (2 credits)

Learning Outcomes

At the end of the course students are able to:

1) discuss the concepts of immunology, pathophysiology, and the management of hypersensitivities and various immune disorders.
2) explain the mechanisms of action, pharmacokinetic properties, adverse effects, and drug interactions of drugs used in various autoimmune disorders.
3) interpret laboratory test results with the principles of patient management.
4) solve pharmaceutical care issues related to these disorders.

Course Synopsis

This module is one of a series of modules that integrates the discipline of pharmacology and clinical pharmacy. In this module, pharmacology of drugs act on the immune system and clinical management of autoimmune disorders will be discussed. Students will also be introduced to the concept of basic immunology, such as inflammation, antigen and immunogenicity, cold-chain reactions and immunization and vaccination.

Reference Texts

1) Katzung, B., Masters, S., & Trevor, A. (2012). Basic and Clinical Pharmacology (12th ed.). McGraw Hill.
2) Brunton, L., Chadner, B., & Knollman, B. (2011). Goodman and Gilman's The Pharmacological Basis of Therapeutics (12th ed.). McGraw Hill.
3) Rang, H., & Dale, M. (2011). Rang and Dale Pharmacology (7th ed.). Elsevier.
4) Dipiro, J.T., Talbert, R.L., Yee, G.C., & Matzke, G.R. (2014). Pharmacotherapy: A Pathophysiologic Approach (9th ed.). McGraw-Hill.
5) Herfindal, E.T., & Gourley, D.R. (2006). Textbooks of Therapeutics. Drug and Disease management (8th ed.). Lippincott Williams and Wilkins.
6) Alldredge, B.K., Corelli, R.L., Ernst, M.E., Guglielmo, B.J., Jacobson, P.A., Kradjan, W.A., & Williams, B.R. (2013). Koda-Kimble and Young's Applied Therapeutics: The Clinical Use of Drugs (10th ed.). Lippincott Williams and Wilkins, USA.
7) British National Formulary (2014 or later edition).
8) Drug Information Handbook (2014 or later edition). Lexi-Comp's Clinical Reference Library.

Course Assessment

Course will be assessed by Continuous Assessment 40% and a Final Examination 60%.

OIA2010: Pharmacotherapy for Infectious Diseases II (2 credits)

Learning Outcomes

At the end of the course students are able to:

1) discuss the pathophysiology and management of infectious diseases caused by viruses, fungals, and mycobacterias.
2) explain the mechanisms of action, pharmacokinetic properties, adverse effects, and drug interactions of drugs used in infectious diseases caused by these organisms.
3) interpret laboratory test results with the principles of patient management.
4) solve pharmaceutical care issues involving infectious diseases.

Course Synopsis

This module is one of the series of modules that integrates the discipline of pharmacology and clinical pharmacy. In this module, the pharmacology of antimicrobials and clinical management of infectious diseases will be discussed. Students will be introduced to the concept of management of infectious diseases caused by viruses, fungi, and mycobacteria. The mechanism of antibiotic resistance, antibiotic policy, and surgical prophylaxis are also given emphasis.

Reference Texts

1) Dipiro, J.T., Talbert, R.L., Yee, G.C., & Matzke, G.R. (2014). Pharmacotherapy: A Pathophysiologic Approach (9th ed.). McGraw-Hill.
2) Herfindal, E.T., & Gourley, D.R. (2006). Textbooks of Therapeutics. Drug and Disease management (8th ed.). Lippincott Williams and Wilkins.
3) Alldredge, B.K., Corelli, R.L., Ernst, M.E., Guglielmo, B.J., Jacobson, P.A., Kradjan, W.A., & Williams, B.R. (2013). Koda-Kimble and Young's Applied Therapeutics: The Clinical Use of Drugs (10th ed.). Lippincott Williams and Wilkins, USA.
4) Katzung, B.G. (2014). Basic and clinical pharmacology (13th ed.). Appleton & Lange.
5) Rang, H.P., & Dale, M.M. (2015). Pharmacology (8th ed.). Churchill Livingstone.
6) Brunton, L., Chadner, B., & Knollman, B. (2011). Goodman and Gilman's The Pharmacological Basis of Therapeutics (12th ed.). McGraw Hill.
7) British National Formulary (2016 or later edition).
8) Drug Information Handbook (2016 or later edition). Lexi-Comp's Clinical Reference Library.

Course Assessment

Course will be assessed by Continuous Assessment 40% and a Final Examination 60%.

OIA2011: Pharmacotherapy for Cardiovascular Disease (3 credits)

Learning Outcomes

At the end of the course students are able to:

1) describe the pathophysiology and management of cardiovascular and cerebrovascular disorders.
2) explain the mechanisms of action, pharmacokinetic properties, adverse effects, and drug interactions of drugs used in cardiovascular and cerebrovascular disorders.
3) interpret laboratory test results with the principles of patient management.
4) solve pharmaceutical care issues for these disorders.

Course Synopsis

This module is one of a series of modules that integrates the discipline of pharmacology and clinical pharmacy. In this module, pharmacology of cardiovascular drugs and clinical management of cardiovascular disorders will be covered. Students will be introduced to the concept of management of various cardiovascular disorders such as hypertension, heart failure, coronary artery disease, arrhythmias, hyperlipidaemia, and stroke. Blood clotting disorders will also be given emphasis.

Reference Texts

1) Katzung, B., Masters, S., & Trevor, A. (2012). Basic and Clinical Pharmacology (12th ed.). McGraw Hill.
2) Brunton, L., Chadner, B., & Knollman, B. (2011). Goodman and Gilman's The Pharmacological Basis of Therapeutics (12th ed.). McGraw Hill.
3) Rang, H., & Dale, M. (2011). Rang and Dale Pharmacology (7th ed.). Elsevier.
4) Dipiro, J.T., Talbert, R.L., Yee, G.C., & Matzke, G.R. (2014). Pharmacotherapy: A Pathophysiologic Approach (9th ed.). McGraw-Hill.
5) Herfindal, E.T., & Gourley, D.R. (2006). Textbooks of Therapeutics. Drug and Disease management (8th ed.). Lippincott Williams and Wilkins.
6) Alldredge, B.K., Corelli, R.L., Ernst, M.E., Guglielmo, B.J., Jacobson, P.A., Kradjan, W.A., & Williams, B.R. (2013). Koda-Kimble and Young's Applied Therapeutics: The Clinical Use of Drugs (10th ed.). Lippincott Williams and Wilkins, USA.
7) British National Formulary (2014 or later edition).
8) Drug Information Handbook (2014 or later edition). Lexi-Comp's Clinical Reference Library.

Course Assessment

Course will be assessed by Continuous Assessment 40% and a Final Examination 60%.

OIA3001: Solid Pharmaceutical Dosage Form Design (3 credits)

Learning Outcomes

At the end of the course students are able to:

1) recognise the concept of solid dosage forms.
2) recognise the industrial manufacturing process and process control of solid dosage forms.
3) perform compendial and non-compendial quality control (QC) tests for solid dosage forms.
4) describe the types, usage, and storage of solid dosage forms.

Course Synopsis

Students will be introduced to overall concept and characteristics of solid pharmaceutical dosage form. Students will be introduced to all basic equipments involved in the manufacturing of solid pharmaceutical dosage form. Student will be trained hands-on in optimization of formulation and manufacturing of solid dosage forms using the facilities in the pilot plant. Students will be also trained to do quality control tests of solid dosage forms.

Reference Texts

1) Aulton, M.E., & Taylor, K.M. (2013). Aulton's Pharmaceutics: The Design and Manufacture of Medicines (4th ed.). Elsevier.
2) Remington: The Science and Practice of Pharmacy (22nd ed.). Mack Publishing Co. USA.
3) Allen, L.V., Popovich, N.G., & Ansel, H.C. (2011). Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems (9 th ed.). Lippincott Williams & Wilkins, USA.
4) Stationery Office (Great Britain). (2012). British Pharmacopoeia 2012. Stationery Office, London.
5) United States Pharmacopoeia 36-NF 31, 2012.

Course Assessment

Course will be assessed by Continuous Assessment 40% and a Final Examination 60%.

OIA3003: Extemporaneous Preparations (2 credits)

Learning Outcomes

At the end of the course students are able to:

1) interpret prescriptions.
2) prepare formulations following standards from BNF and BPC.
3) design conventional formulations of extemporaneous preparations.
4) demonstrate the good dispensing practice.

Course Synopsis

Most of the content of this module involves practical session of dispensing of extemporaneous preparations of various dosage forms (solid, liquid, semi-solid). Students will be trained in reading and screening prescriptions. Methods of dosage calculation, dispensing instructions, and labeling of extemporaneous preparations are also included.

Reference Texts

1) Aulton, M.E., & Taylor, K.M. (2013). Aulton's Pharmaceutics: The Design and Manufacture of Medicines (4th ed.). Elsevier.
2) British National Formulary (BNF) 67 (2014 or later edition).
3) Carter, S.J. (2008). Cooper & Gunn's Dispensing for Pharmaceutical Students (12th ed.). Churchill Livingstone, UK.
4) Pharmaceutical Society of Britain (2012). British Pharmaceutical Codex (BPC). The Pharmaceutical Press, UK.
5) Stoklosa, M.J., & Ansel, H.C. (2011). Pharmaceutical Calculations (11th ed.). Lippincott William & Wilkins, Philadelphia, USA.
6) Royal Pharmaceutical Society (2014). Martindale: The complete drug reference (38th ed.). The Pharmaceutical Press, UK.

Course Assessment

Course will be assessed by Continuous Assessment 40% and a Final Examination 60%.

OIA3004: Principles and Applications of Pharmacokinetics (2 credits)

Learning Outcomes

At the end of the course students are able to:

1) describe the different approaches in pharmacokinetic analyses.
2) determine pharmacokinetic parameters by interpreting the relationship between dosing regimen and time course of serum, plasma, or other body fluid drug concentration data.
3) formulate appropriate dosing regimens utilizing derived pharmacokinetic parameters in specific patient demographics and organ function.

Course Synopsis

This module is designed to help students to understand the principles of pharmacokinetics, and to apply these principles to pharmacy practice including therapeutic drug monitoring of specific drugs, leading to the quality use of drugs and better patient outcome.

Reference Texts

1) Murphy, J., & American Society of Health-System Pharmacists. (2008). Clinical pharmacokinetics (4th ed.). Bethesda, MD: American Society of Health-System Pharmacists.
2) Dhillon, S., & Kostrzewski, A., MRPharmS. (2009). Clinical pharmacokinetics. Pharmaceutical Press, London.
3) Rowland, M., & Tozer, T. (2011). Clinical pharmacokinetics and pharmacodynamics : Concepts and applications (4th ed.). Lippincott Williams & Wilkins, USA
4) Venkateswarlu, V. (2008). Biopharmaceutics and Pharmacokinetics. PharmaMed Press.
5) Schumacher, G. (1995). Therapeutic drug monitoring. Appleton & Lange.

Course Assessment

Course will be assessed by Continuous Assessment 40% and a Final Examination 60%.

OIA3005: Pharmacotherapy for Endocrine Disorders (3 credits)

Learning Outcomes

At the end of the course students are able to:
1) describe the pathophysiology and management of endocrine and metabolic disorders.
2) explain the mechanisms of action, pharmacokinetic properties, adverse effects, and drug interactions of drugs used in endocrine and metabolic disorders.
3) interpret laboratory test results with the principles of patient management.
4) solve pharmaceutical care issues for these disorders.

Course Synopsis

This module is one of a series of modules that integrates the discipline of pharmacology and clinical pharmacy. In this module, pharmacology of endocrine drugs and clinical management of endocrine disorders will be covered. Students will be introduced to the concept of management of various endocrine disorders such as diabetes mellitus, diabetes insipidus, thyroid and parathyroid disorders, adrenal, pituitary and hypothalamus glands disorders, obesity, and osteoporosis.

Reference Texts

1) Brunton, L., Chadner, B., & Knollman, B. (2011). Goodman and Gilman's The Pharmacological Basis of Therapeutics (12th ed.). McGraw Hill.
2) Katzung, B.G. (2015). Basic and clinical pharmacology (13th ed.). McGraw-Hill.
3) Rang, H., & Dale, M. (2012). Pharmacology (7th ed.). Churchill Livingstone.
4) Dipiro, J.T., Talbert, R.L., Yee, G.C., & Matzke, G.R. (2011). Pharmacotherapy: A Pathophysiologic Approach (8th ed.). McGraw-Hill.
5) Herfindal, E.T., & Gourley, D.R. (2000). Textbooks of Therapeutics. Drug and Disease management (7th ed.). Lippincott Williams and Wilkins.
6) Alldredge, B.K., Corelli, R.L., Ernst, M.E., Guglielmo, B.J., Jacobson, P.A., Kradjan, W.A., & Williams, B.R. (2013). Koda-Kimble and Young's Applied Therapeutics: The Clinical Use of Drugs (10th ed.). Lippincott Williams and Wilkins, USA.
7) British National Formulary (2014 or later edition).
8) Drug Information Handbook (2013 or later edition). Lexi-Comp's Clinical Reference Library.

Course Assessment

Course will be assessed by Continuous Assessment 40% and a Final Examination 60%.

OIA3006: Anaesthesia and Pharmacotherapy for Neurological Disorders (2 credits)

Learning Outcomes

At the end of the course students are able to:

1) describe the pathophysiology and management of neurological disorders, as well as principles of the premedication and anaesthesia.
2) explain the mechanisms of action, pharmacokinetic properties, adverse effects, and drug interactions of drugs used in neurological disorders, local, and general anaesthetics.
3) interpret laboratory test results with the principles of patient management.
4) solve pharmaceutical care issues for these disorders.

Course Synopsis

This module is one of a series of modules that integrates the discipline of pharmacology and clinical pharmacy. In this module, the clinical management of neurological disorders, principles of premedication and anaesthesia, as well the pharmacology and application of related drugs will be covered. Students will be introduced to the concept of management of various neurological disorders such as Alzheimer, Parkinson, and epilepsy.

Reference Texts

1) Katzung, B.G. (2012). Basic and clinical pharmacology (12th ed.). McGraw-Hill.
2) Brunton, L., Chadner, B., & Knollman, B. (2011). Goodman and Gilman's The Pharmacological Basis of Therapeutics (12th ed.). McGraw Hill.
3) Rang, H., & Dale, M. (2011). Rang and Dale Pharmacology (7th ed.). Elsevier.
4) Dipiro, J.T., Talbert, R.L., Yee, G.C., & Matzke, G.R. (2014). Pharmacotherapy: A Pathophysiologic Approach (9th ed.). McGraw-Hill.
5) Herfindal, E.T., & Gourley, D.R. (2007). Textbooks of Therapeutics. Drug and Disease management (8th ed.). Lippincott Williams and Wilkins.
6) Alldredge, B.K., Corelli, R.L., Ernst, M.E., Guglielmo, B.J., Jacobson, P.A., Kradjan, W.A., & Williams, B.R. (2013). Koda-Kimble and Young's Applied Therapeutics: The Clinical Use of Drugs (10th ed.). Lippincott Williams and Wilkins, USA.
7) British National Formulary (2014 or later edition).
8) Drug Information Handbook (2014 or later edition). Lexi-Comp's Clinical Reference Library.

Course Assessment

Course will be assessed by Continuous Assessment 40% and a Final Examination 60%.

OIA3007: Biostatistics and Epidemiology (2 credits)

Learning Outcomes

At the end of the course students are able to:

1) calculate and interpret measures of frequency (rates, ratios, incidence, prevalence) and effects (relative risk, odds ratio, absolute risk NNT).
2) describe advantages, disadvantages, elements of study design, and appropriate effect measures for various epidemiological study designs.
3) identify potential sources of bias and their probable effect on the validity of a study or study findings (selection bias, information bias, confounding).
4) detect confounding and effect modification (including stratification, randomization, matching).

Course Synopsis

Introduces biostatistical and epidemiological concepts necessary for the interpretation, evaluation, and communication particularly applicable to biomedical health sciences. Topics include: descriptive statistics, estimation and hypothesis testing, correlation, regression, contingency tables, graphical data displays, introduction to SPSS, biomedical study design, randomization, control bias, variability, and confounding. Data analysis using SPSS will be an essential component of the module. Students participate in group projects, group discussions, and oral presentations.

Reference Texts

1) Dawson, B., & Trapp, R. (2004). Basic & clinical biostatistics (4th ed., A lange medical book). McGraw-Hill.
2) Pagano, M., & Gauvreau, K. (2000). Principles of biostatistics (2nd ed.). Duxbury.
3) Strom, B.L., Kimmel, S.E., & Hennessy, S. (2012). Pharmacoepidemiology, (5th ed.). Wiley-Blackwell.
4) Gordis, L. (2009). Epidemiology. Elsevier/Saunders.
5) Greenhalgh, T. (2001). How to Read a Paper: The Basics of Evidence Based Medicine (2nd ed.). BMJ Books.
6) Article handouts in lectures.

Course Assessment

Course will be assessed by Continuous Assessment 40% and a Final Examination 60%.

OIA3008: Management Skills for Pharmacists (2 credits)

Learning Outcomes

At the end of the course students are able to:

1) define a healthy working environment in various settings of a pharmacy profession.
2) discuss the basic entrepreneurship skills needed for pharmacists.
3) demonstrate the skills in resolving issues through problem solving, conflict, and stress management.
4) apply effective management skills such as proper leadership, effective delegation, empowerment, and motivation in real time.

Course Synopsis

Students will be introduced and exposed to the theory of management and its application in the profession of pharmacy.

Reference Texts

1) Titus De Silva (2013). Essential Management Skills for Pharmacy and Business Managers. Productivity Press.
2) Chisholm-Burns, M.A., Vaillancourt, A.M., & Shepherd, M. (2012). Pharmacy Management, Leadership, Marketing and Finance (2nd ed.). Jones & Bartlett Learning, USA.

Course Assessment

Course will be assessed by Continuous Assessment 50% and a Final Examination 50%.

OIA3010: Advanced Pharmaceutical Dosage Form Design (3 credits)

Learning Outcomes

At the end of the course students are able to:

1) identify advanced dosage forms, which are new in the market and those in research stage.
2) illustrate the use of various types of polymers in the formulation of advanced dosage forms.
3) formulate slow release, sustained release, targeted release dosage forms, and those suitable for macromolecular delivery.
4) describe the types, usage, and storage of advanced dosage forms.

Course Synopsis

Students will be introduced to overall concept and principles of advanced pharmaceutical products. Students will be introduced to the basic materials and equipment in manufacturing of advanced products. Students will be introduced to various types of advanced products in the market or those that are still in the research pipeline.

Reference Texts

1) Aulton, M.E., & Taylor, K.M. (2013). Aulton's Pharmaceutics: The Design and Manufacture of Medicines (4th ed.). Elsevier.
2) Remington: The Science and Practice of Pharmacy (22nd ed.). Mack Publishing Co. USA.
3) Allen, L.V., Popovich, N.G., & Ansel, H.C. (2011). Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems (9 th ed.). Lippincott Williams & Wilkins, USA.
4) Stationery Office (Great Britain). (2012). British Pharmacopoeia 2012. Stationery Office, London..
5) United States Pharmacopoeia. (2012). 36-NF 31.

Course Assessment

Course will be assessed by Continuous Assessment 40% and a Final Examination 60%.

OIA3011: Pharmacotherapy for Renal Disorders, Cancer and Pain (2 credits)

Learning Outcomes

At the end of the course students are able to:

1) describe the pathophysiology and management of cancer, pain, and renal disorders.
2) explain the mechanisms of action, pharmacokinetic properties, adverse effects, and drug interactions of drugs used in the management of cancer, pain and renal disorders.
3) interpret laboratory test results based on the principles of patient management.
4) solve pharmaceutical care issues that are relevant to these disorders.

Course Synopsis

This module is one of the series of modules that integrates the discipline of pharmacology and clinical pharmacy. In this module, the pharmacology of drugs used for the clinical management of pain, cancer, and renal disorders will be taught. Students will be introduced to the concepts of the clinical management of various pain disorders, cancers such as solid and non-solid cancers, as well as renal disorders, which include acute kidney injury and chronic renal failure.

Reference Texts

1) Katzung, B., Masters, S., & Trevor, A. (2012). Basic and Clinical Pharmacology (12th ed.). McGraw Hill.
2) Brunton, L., Chadner, B., & Knollman, B. (2011). Goodman and Gilman's The Pharmacological Basis of Therapeutics (12th ed.). McGraw Hill.
3) Rang, H., & Dale, M. (2011). Rang and Dale Pharmacology (7th ed.). Elsevier.
4) Dipiro, J.T., Talbert, R.L., Yee, G.C., & Matzke, G.R. (2014). Pharmacotherapy: A Pathophysiologic Approach (9th ed.). McGraw-Hill.
5) Herfindal, E.T., & Gourley, D.R. (2006). Textbooks of Therapeutics. Drug and Disease management (8th ed.). Lippincott Williams and Wilkins.
6) Alldredge, B.K., Corelli, R.L., Ernst, M.E., Guglielmo, B.J., Jacobson, P.A., Kradjan, W.A., & Williams, B.R. (2013). Koda-Kimble and Young's Applied Therapeutics: The Clinical Use of Drugs (10th ed.). Lippincott Williams and Wilkins, USA.
7) British National Formulary (2015 or later edition).
8) Drug Information Handbook (2014 or later edition). Lexi-Comp's Clinical Reference Library.

Course Assessment

Course will be assessed by Continuous Assessment 40% and a Final Examination 60%.

OIA3012: Pharmacotherapy for Psychiatric Disorders (2 credits)

Learning Outcomes

At the end of the course students are able to:

1) describe the pathophysiology and management of psychiatric disorders.
2) explain the mechanisms of action, pharmacokinetic properties, adverse effects, and drug interactions of drugs used in psychiatric disorders.
3) interpret laboratory test results with the principles of patient management.
4) solve pharmaceutical care issues for these disorders.

Course Synopsis

This module is one of a series of modules that integrates the discipline of pharmacology and clinical pharmacy. In this module, pharmacology of psychiatric drugs and clinical management of psychiatric disorders will be covered. Students will be introduced to the concept of management of various psychiatric disorders such as depression, anxiety, schizophrenia, and Alzheimer. Substance-related disorders will also be given emphasis.

Reference Texts

1) Katzung, B., Masters, S., & Trevor, A. (2012). Basic and Clinical Pharmacology (12th ed.). McGraw Hill.
2) Brunton, L., Chadner, B., & Knollman, B. (2011). Goodman and Gilman's The Pharmacological Basis of Therapeutics (12th ed.). McGraw Hill.
3) Rang, H., & Dale, M. (2011). Rang and Dale Pharmacology (7th ed.). Elsevier.
4) Dipiro, J.T., Talbert, R.L., Yee, G.C., & Matzke, G.R. (2014). Pharmacotherapy: A Pathophysiologic Approach (9th ed.). McGraw-Hill.
5) Herfindal, E.T., & Gourley, D.R. (2006). Textbooks of Therapeutics. Drug and Disease management (8th ed.). Lippincott Williams and Wilkins.
6) Alldredge, B.K., Corelli, R.L., Ernst, M.E., Guglielmo, B.J., Jacobson, P.A., Kradjan, W.A., & Williams, B.R. (2013). Koda-Kimble and Young's Applied Therapeutics: The Clinical Use of Drugs (10th ed.). Lippincott Williams and Wilkins, USA.
7) British National Formulary (2014 or later edition).
8) Drug Information Handbook (2014 or later edition). Lexi-Comp's Clinical Reference Library.

Course Assessment

Course will be assessed by Continuous Assessment 40% and a Final Examination 60%.

OIA3014: Evidence-based Pharmacotherapy (2 credits)

Learning Outcomes

At the end of the course students are able to:

1) recognise the format, steps, processes, and application of systematic reviews and meta-analysis.
2) relate the methodology and statistical concepts associated with systematic reviews and meta-analysis.
3) interpret the results of a systematic review and meta-analysis.
4) appraise systematic reviews and meta-analysis according to quality criteria.

Course Synopsis

The aim of this module is to provide an introduction to systematic review methodology and critical appraisal skills. Attention will be restricted to the quantitative evaluation of effectiveness in health-related research. Topics include the role of systematic reviews and meta-analysis and their impact, developing a protocol for a systematic review, literature searching, critical appraisal of primary studies and systematic reviews, data extraction synthesis, and meta-analysis. The module will use a combination of group work, discussion, and presentation.

Reference Texts

1) Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0 [updated March 2011]. Higgins JPT, Green S (editors). The Cochrane Collaboration, 2011. Available from www.cochrane-handbook.org.
2) Sackett, D.L. (2000). Evidence-based Medicine: How to Practice and Teach EBM. Churchill Livingstone.
3) Greenhalgh, T. (2001). How to Read a Paper: The Basics of Evidence Based Medicine (2nd ed.). BMJ Books.
4) Article handouts in lectures.

Course Assessment

Course will be assessed by Continuous Assessment 40% and a Final Examination 60%.

OIA3015: Pharmacy Ethics and Legislation (2 credits)

Learning Outcomes

At the end of the course students are able to:

1) apply the different pharmacy legislation in daily carrying on the business of pharmacy.
2) apply the requirement of regulatory authority on different pharmaceutical products in Malaysia.
3) perform enforcement and court presentation on pharmacy cases in Malaysia.
4) relate advice to other professional and the general public on legislation of drug and pharmaceutical in Malaysia.
5) practise the professional ethics of pharmacist.

Course Synopsis

Students will be introduced to the concept of basic laws and legislation followed by the understanding of the five Malaysian pharmaceutical legislations. These legislations govern the control on chemical and pharmaceutical material, medicine, advertisement of medicine and medical matters, and the professional ethics of pharmacist.

Reference Texts

1) The Poisons Act 1952.
2) The Medicines Advertisement and Sales act 1956.
3) The Drug sales Act 1952.
4) Registration of Pharmacists Act 1951.
5) Dangerous Drugs Act 1952.
6) Pharmacist Malaysian Code of Conduct.
7) Medicine Trade Act.

Course Assessment

Course will be assessed by Continuous Assessment 40% and a Final Examination 60%.

OIA3016: Professional Pharmacy Attachment (2 credits)

Learning Outcomes

At the end of the course students are able to:

1) discuss the roles of pharmacists in both hospital pharmacies, and community pharmacies or pharmaceutical industries.

2) describe the various services provided in a both hospital pharmacy, and community pharmacy or pharmaceutical industry.

Course Synopsis

This module involves attachment of students to both hospital pharmacy, and community pharmacy or pharmaceutical industry. The student will be familiar with the roles of pharmacists in the various sectors of pharmacy services and also know the activities or services provided by these pharmacies.

Reference Texts

1) British National Formulary (BNF), British Medical Association (2014 or later edition).

2) The United States Pharmacopoeia Convention. Information for the Health Care Provider. USP-DI Vol. 1. Pennyslvania,

3) Blenkinsopp, A., & Paxton, P. (2009). Symptoms in the Pharmacy: A Guide to the Management of Common Illness. Blackwell Scientific Publications.

4) Handbook of Nonprescription Drugs, American Pharmacists Association.

5) MIMS, CMPMedica Pacific Ltd., Malaysia (2014 or later edition).

6) Waterfield, J. (2008). Community Pharmacy Handbook. Pharmaceutical Press, London.

7) Drug Information Handbook (2014 or later edition). Lexi-Comp's Clinical Reference Library.

Course Assessment

Course will be assessed by Continuous Assessment 100%.

OIA4001: Pharmaceutical Quality Assurance (2 credits)

Learning Outcomes

At the end of the course students are able to:

1) describe the Quality System enforced on pharmaceutical manufacturers, wholesalers, and importers.
2) discuss the requirement of Quality System for analytical laboratories.
3) explain the validation technique for manufacturing process and quality control in pharmaceutical industry.

Course Synopsis

Students will be introduced to the overall concept of Quality Assurance, the need of Quality Assurance in Pharmaceutical Industries and its applications. Student will be introduced to the concept of GMP plan layout for the manufacturing facility of dosage forms. Students will be introduced to different elements of Quality Assurance, principles of GMP, GLP, GSP and their regulations. International standards of quality and their relevance to Quality Assurance will be explained

Reference Texts

1) Remington: The Science and Practice of Pharmacy (22nd ed.). Mack Publishing Co. USA.
2) Sale of Drugs Act 1952.
3) Rules of Drugs and Cosmetics act 1984.
4) Quality Assurance guidelines Malaysia and the Union Health Organization (WHO), 2014.
5) Willig, S. (2000). Good Manufacturing Practices for Pharmaceuticals: A Plan for Total Quality Control from Manufacturer to consumer (5th ed.). CRC Press, USA.
6) Pharmaceutical Inspection Co-operation Scheme GMP guidelines, 2014.

Course Assessment

Course will be assessed by Continuous Assessment 40% and a Final Examination 60%.

OIA4002: Pharmacoeconomics (2 credits)

Learning Outcomes

At the end of the course students are able to:

1) explain different methods of economic evaluations of health care programmes.
2) determine the different types of costs that relate to different perspectives used in economic evaluations.
3) critically appraise published economic evaluations of health care programmes for health care decision making.

Course Synopsis

Students will be taught the key principles of pharmacoeconomics and be exposed to issues relating to the delivery of health care. The use of data from economic evaluations to inform health care decision making will be discussed.

Reference Texts

1) Drummond, M.F., Sculpher, M.J., Torrance, G.W., O'Brien, B.J., & Stoddart, G.L. (2005). Methods for the Economic Evaluation of Health Care Programmes (3rd ed.). Oxford Press.
2) Elliott, R., & Payne, K. (2005). Essentials of Economic Evaluation in Health Care (4th ed.). Pharmaceutical Press.
3) Morris, S., Devlin, N., & Parkin, D. (2007). Economic Analysis in Health Care. John Wiley and Sons.
4) Gray, A., Clarke, P., Wolstenholme, J., & Wordsworth, S. (2010). Applied Methods of Cost-Effectiveness Analysis in Health Care. Oxford University Press.

Course Assessment

Course will be assessed by Continuous Assessment 40% and a Final Examination 60%.

OIA4004: Hospital and Community Pharmacy Practice (3 credits)

Learning Outcomes

At the end of the course students are able to:

1) describe the roles of hospital and community pharmacists.
2) evaluate common health problems presented at community pharmacies and provide appropriate counselling.
3) interpret screening tests such as blood glucose levels.
4) perform prescriptions screening and resolve any discrepancies.

Course Synopsis

The roles of hospital and community pharmacists will be explained in detail. Students will be trained to check prescriptions thoroughly and to prevent medication errors. Emphasis will be placed on therapeutic uses of drugs, abnormal doses, drug-drug interactions, and contraindications. Issues related to medication adherence will be emphasised. The general structure of a community pharmacy including benchmarking requirements will be discussed. Measures to encourage the general public on self-care will be provided. Screening tests such as blood glucose tests will be explained. Some common minor health ailments and general principles of responding to symptoms in a community pharmacy will be discussed. Methods of counselling and interactions between a pharmacist with patients and doctors will be emphasised through role-play.

Reference Texts

1) British National Formulary (BNF), British Medical Association (2014 or later edition).
2) The United States Pharmacopoeia Convention. Information for the Health Care Provider. USP-DI Vol. 1. Pennyslvania.
3) Blenkinsopp, A., & Paxton, P. (2009). Symptoms in the Pharmacy: A Guide to the Management of Common Illness, Blackwell Scientific Publications.
4) Handbook of Nonprescription Drugs, American Pharmacists Association, or later edition.
5) MIMS, CMPMedica Pacific Ltd., Malaysia (2014 or later edition).
6) Waterfield, J. (2008). Community Pharmacy Handbook. Pharmaceutical Press, London.
7) Drug Information Handbook (2014 or later edition). Lexi-Comp's Clinical Reference Library.

Course Assessment

Course will be assessed by Continuous Assessment 100%.

OIA4005: Clinical Clerkship I (2 credits)

Learning Outcomes

At the end of the course students are able to:

1) demonstrate an understanding of medical case reports of patients.
2) interpret laboratory results with regards to the pathophysiologic changes due to diseases.
3) identify the pharmaceutical care issues from the clerked cases.
4) apply the principles of drug management to resolve pharmaceutical care issues associated with it.

Course Synopsis

This module includes clerkships at the wards in University Malaya Medical Centre (UMMC). The focus of this module is on clerkship and clinical case presentation by the students in order to further equip them to provide pharmaceutical care to patients.

Reference Texts

1) Galt, K.A. (2006). Developing Clinical Practice Skills for Pharmacists. American Society of Health-System Pharmacists Publication.
2) Tietze, K.J. (2012). Clinical Skills for Pharmacists: A Patient-focused Approach. Elsevier/Mosby.
3) Katzung, B., Masters, S., & Trevor, A. (2012). Basic and Clinical Pharmacology (12th ed.). McGraw Hill.
4) Brunton, L., Chadner, B., & Knollman, B. (2011). Goodman and Gilman's The Pharmacological Basis of Therapeutics (12th ed.). McGraw Hill.
5) Rang, H., & Dale, M. (2011). Rang and Dale Pharmacology (7th ed.). Elsevier.
6) Dipiro, J.T., Talbert, R.L., Yee, G.C., & Matzke, G.R. (2014). Pharmacotherapy: A Pathophysiologic Approach (9th ed.). McGraw-Hill.
7) Walker, R. (2003). Clinical Pharmacy and Therapeutics. Churchill Livingstone.
8) Alldredge, B.K., Corelli, R.L., Ernst, M.E., Guglielmo, B.J., Jacobson, P.A., Kradjan, W.A., & Williams, B.R. (2013). Koda-Kimble and Young's Applied Therapeutics: The Clinical Use of Drugs (10th ed.). Lippincott Williams and Wilkins, USA.
9) Drug Information Handbook (2014 or later edition). Lexi-Comp's Clinical Reference Library.

Course Assessment

Course will be assessed by Continuous Assessment 100%.

OIA4006: Research Methodology (2 credits)

Learning Outcomes

At the end of the course students are able to:

1) recognise the basic principles of research, various types of research, and the importance of research ethics.
2) manage relevant information from multiple sources.
3) produce a written research protocol and an oral protocol presentation.

Course Synopsis

Students will be introduced to various types of research, e.g. laboratory-based, technology-based, and social research that involve survey work. Besides being exposed to methods for protocol writing and usage of referencing manager, students will also be exposed to the importance of ethics in research. This module will prepare the students for Research Project module in the coming semester.

Reference Texts

1) Field, A., & Hole, G.J. (2008). How to Design and Report Experiments. SAGE Publications Ltd, London.
2) Smith, F. (2002). Research Methods in Pharmacy Practice. Pharmaceutical Press, London.
3) Chung, L.Y., & Hussain, S. (2003). Bachelor of Pharmacy (Honours) Undergraduate Research Guidelines for MWEF 3185 Research Methodology and MWEF 3186 Research Project. Department of Pharmacy, Faculty of Medicine, University of Malaya, Kuala Lumpur, Malaysia.

Course Assessment

Course will be assessed by Continuous Assessment 100%.

OIA4007: Industrial Pharmacy and Regulatory Control (2 credits)

Learning Outcomes

At the end of the course students are able to:

1) compare the trend and forecast of the global pharmaceutical industry to that in Malaysia.
2) describe the process of drug registration with the National Pharmaceutical Control Bureau of Malaysia.
3) discuss the techniques and requirements of research in production of generic products.

Course Synopsis

Students will be introduced to the concept of comprehensive characteristics of the pharmaceutical industry in Malaysia and compare that with developed countries. Students will be introduced to Malaysian pharmaceutical regulatory control, method of registration, and legal issues. Students will be introduced to the principles of drug development, at laboratory level, pilot scale level, at the factory level, and the process of "scaling-up".

Reference Texts

1) Aulton, M.E., & Taylor, K.M. (2013). Aulton's Pharmaceutics: The Design and Manufacture of Medicines (4th ed.). Elsevier.
2) Remington: The Science and Practice of Pharmacy (22nd ed.). Mack Publishing Co. USA.
3) Sale of Drugs Act 1952.
4) Rules of Drugs and Cosmetics act 1984.
5) Quality Assurance guidelines Malaysia and the Union Health Organization (WHO), 2014.
6) Willig, S. (2000). Good Manufacturing Practices for Pharmaceuticals: A Plan for Total Quality Control from Manufacturer to consumer (5th ed.). CRC Press, USA.
7) Pharmaceutical Inspection Co-operation Scheme GMP guidelines, 2014.

Course Assessment

Course will be assessed by Continuous Assessment 40% and a Final Examination 60%.

OIA4008: Clinical Clerkship II (2 credits)

Learning Outcomes

At the end of the course students are able to:

1) identify specific characteristics in age or disease-related changes that need special attention with regards to optimizing drug therapy and minimizing adverse drug reactions.
2) evaluate the drug therapy for patient care in the ward.
3) formulate an effective therapeutic management plan for drug and non-drug treatment for a particular disease state.

Course Synopsis

This module is a continuation of the Clinical Clerkship I. The learning for this module is based on ward visits and discussion with the clinical preceptors. The focus of this module is on the clerkship and the clinical case presentation by students in order to further equip them to provide pharmaceutical care to patients.

Reference Texts

1) Galt, K.A. (2006). Developing Clinical Practice Skills for Pharmacists. American Society of Health-System Pharmacists Publication.
2) Tietze, K.J. (2012). Clinical Skills for Pharmacists: A Patient-focused Approach. Elsevier/Mosby.
3) Katzung, B., Masters, S., & Trevor, A. (2012). Basic and Clinical Pharmacology (12th ed.). McGraw Hill.
4) Brunton, L., Chadner, B., & Knollman, B. (2011). Goodman and Gilman's The Pharmacological Basis of Therapeutics (12th ed.). McGraw Hill.
5) Rang, H., & Dale, M. (2011). Rang and Dale Pharmacology (7th ed.). Elsevier.
6) Dipiro, J.T., Talbert, R.L., Yee, G.C., & Matzke, G.R. (2014). Pharmacotherapy: A Pathophysiologic Approach (9th ed.). McGraw-Hill.
7) Walker, R. (2003). Clinical Pharmacy and Therapeutics. Churchill Livingstone.
8) Alldredge, B.K., Corelli, R.L., Ernst, M.E., Guglielmo, B.J., Jacobson, P.A., Kradjan, W.A., & Williams, B.R. (2013). Koda-Kimble and Young's Applied Therapeutics: The Clinical Use of Drugs (10th ed.). Lippincott Williams and Wilkins, USA.
9) Drug Information Handbook (2014 or later edition). Lexi-Comp's Clinical Reference Library.

Course Assessment

Course will be assessed by Continuous Assessment 100%.

OIA4009: Research Project (6 credits)

Learning Outcomes

At the end of the course students are able to:

1) apply the principles of research in carrying out data collection.
2) analyse data correctly.
3) compose research findings.
4) critique research findings in relation to published literature.
5) produce a written dissertation according to the requirements and an oral presentation of the research findings using audiovisual aid.

Course Synopsis

Students will carry out their research project under the supervision and guidance of the respective lecturers in the Dept. of Pharmacy. They will collect data, analyse them and write up their dissertations. Every student will also present their work orally.

Reference Texts

1) Field, A., & Hole, G.J. (2008). How to Design and Report Experiments. SAGE Publications Ltd, London.
2) Smith, F. (2002). Research Methods in Pharmacy Practice. Pharmaceutical Press, London.
3) Chung, L.Y., & Hussain, S. (2003). Bachelor of Pharmacy (Honours) Undergraduate Research Guidelines for MWEF 3185 Research Methodology and MWEF 3186 Research Project. Department of Pharmacy, Faculty of Medicine, University of Malaya, Kuala Lumpur, Malaysia.

Course Assessment

Course will be assessed by Continuous Assessment 100%.