UNIVERSITI MALAYA

FAKULTI FARMASI
Faculty of Pharmacy

UNDERGRADUATE HANDBOOK BACHELOR OF PHARMACY (HONS)

ACADEMIC SESSION 2024/2025

FACULTY OF PHARMACY UNIVERSITI MALAYA

Faculty of Pharmacy, Universiti Malaya reserves the right to make decisions and amendments to the information contained in this Handbook as it deems.

Faculty of Pharmacy
Universiti Malaya
50603 Kuala Lumpur
https://pharmacy.um.edu.my

TABLE OF CONTENTS

Welcoming Message from Dean

Welcome to the Faculty of Pharmacy, University of 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. Our four-year program has been meticulously designed to shape you to become an outstanding pharmacist enabling you to provide excellent 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, the 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”.

PROFFESOR DR. HASNIZA ZAMAN HURI
Dean
Faculty of Pharmacy

ADMINISTRATIVE MANAGEMENT CHART

DR. IZYAN A. WAHAB
DEPUTY DEAN
(UNDERGRADUATE & STUDENT AFFAIR)

ASSOC. PROF. DR. BAHARUDIN IBRAHIM
DEPUTY DEAN
(POSTGRADUATE, RESEARCH & INNOVATION)

PROF. DR. HASNIZA ZAMAN HURI
DEAN

DR. NUSAIBAH ABD RAHIM
DEPUTY DEAN
(DEVELOPMENT)

MADAM SALBIAH SAMSUDIN
MANAGER

DR. HEH CHOON HAN
HEAD
Department of Pharmaceutical Chemistry

DR. KAYATRI GOVINDARAJU
HEAD
Department of Pharmaceutical Life Sciences

DR. ZARIF MOHAMED SOFIAN
HEAD
Department of Pharmaceutical Technology

DR. RAJA AHSAN AFTAB
HEAD
Department of Clinical Pharmacy & Pharmacy Practice

PROGRAMME COORDINATORS

DR. NOORASYIKIN SHAMSUDDIN

- Coordinator of Undergraduate BPharm (Hons) Programme
- Email: noorasyikin@um.edu.my

DR. ASFARINA AMIR HASSAN

- Coordinator of Mobility Programme
- Email: asfarina_amir@um.edu.my

DR. NUR AKMARINA MOHD SAID

- Coordinator of Student Affairs & Corporate Social Resposibility
- Email: nur_akmarina@um.edu.my

DEPARTMENT OF PHARMACEUTICAL CHEMISTRY

.

DR. HEH CHOON HAN
HEAD OF DEPARTMENT
- Pharmacy Lecturer
- Email: silverbot@um.edu.my

Prof. Dr. Chung Lip Yong
- Honorary Professor
- Email: chungly@um.edu.my

Assoc. Prof. Dr. Rozana Othman
- Associate Professor
- Email: rozanaothman@ um.edu.my

Assoc. Prof. Dr. Najihah Mohd Hashim
- Associate Professor
- Email: najihahmh@um.edu.my

Dr. Leong Kok Hoong
- Senior Lecturer
- Email: leongkh@um.edu.my

Dr. Chin Sek Peng
- Senior Lecturer
- Email: spchin@um.edu.my

Dr. Lokesh Bontha Venkata Subrahmanya
- Senior Lecturer
- Email: drlokesh.bontha@um.edu.my

Dr. Asfarina Amir Hassan
- Senior Lecturer
- Email: asfarina_amir@um.edu.my

Dr Alicia Ng Chean Hui
- Senior Lecturer
- Email: chng@um.edu.my

DEPARTMENT OF PHARMACEUTICAL LIFE SCIENCES

DR KAYATRI GOVINDARAJU

HEAD OF DEPARTMENT

- Pharmacy Lecturer
- Email: gkayatri@um.edu.my

Dr Amira Hajirah Abd Jamil

- Pharmacy Lecturer
- Email: amira.j@um.edu.my

Dr. Nur Akmarina Mohd Said

- Pharmacy Lecturer
- Email: nur_akmarina@um.edu.my

Dr. Phan Chia Wei

- Senior Lecturer
- Email: phancw@um.edu.my

Dr. Gareth Sim Maw Shin

- Senior Lecturer
- Email: garethsim@um.edu.my

Dr. Wan Safwani Wan Kamarul Zaman

- Senior Lecturer
- Email: wansafwani@um.edu.my

Dr. Yow Hui Yin

- Pharmacy Lecturer
- Email: huiyin.yow@um.edu.my

Dr. Yvonne Liew Jing

- Lecturer
- Email: yvonneljm@um.edu.my

DEPARTMENT OF PHARMACEUTICAL TECHNOLOGY

DR. ZARIF MOHAMED SOFIAN

HEAD OF DEPARTMENT

- Senior Lecturer
- Email: ms_zarif@um.edu.my

Dr. Shaik Nyamathulla

- Senior Lecturer
- Email: nyamthullask@um.edu.my

Dr. Janet Tan Sui Ling

- Pharmacy Lecturer
- Email: janet.tan@um.edu.my

Dr. Md. Jasim Uddin

- Senior Lecturer
- Email: j.uddin@um.edu.my

Ts. Dr. Muhammad Luqman bin Nordin

- Senior Lecturer
- Email: muhammadluqman@um.edu.my

Dr. Riyanto Teguh Widodo

- Pharmacy Lecturer
- Email: riyanto@um.edu.my

Dr. Syed Mahmood

- Senior Lecturer
- Email: syedmahmood@um.edu.my

Dr. Sharifah Shakirah Syed Omar

- Pharmacy Lecturer
- Email: shakirah@um.edu.my

Dr. Muhammad Fauzi Abd Jalil

- Senior Lecturer
- Email: fauzijalil01@um.edu.my

Prof. Wong Tin Wui

- Adjunct Professor
- Email: wongtinhui@yahoo.com

DEPARTMENT OF CLINICAL PHARMACY & PHARMACY PRACTICE

DR. RAJA AHSAN AFTAB

HEAD OF DEPARTMENT

- Pharmacy Lecturer
- Email: rajaahsan.aftab@um.edu.my

Prof. Dr. Hasniza Zaman Huri

- Professor
- Email: hasnizazh@um.edu.my

Assoc. Prof. Dr. Baharudin Ibrahim

- Associate Professor
- Email: baharudin.ibrahim@um.edu.my

Madam Syireen Alwi

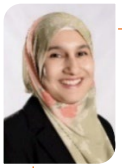
- Pharmacy Lecturer
- Email: syireen@um.edu.my

Ms. Mary Lee Hong Gee

- Pharmacy Lecturer
- Email: marylee@um.edu.my

Dr. Noorasyikin Shamsuddin

- Pharmacy Lecturer
- Email: noorasyikin@um.edu.my



Dr. Fatiha Hana Shabaruddin

- Pharmacy Lecturer
- Email: fatiha.shabaruddin@um.edu.my

Dr. Izyan Abdul Wahab

- Pharmacy Lectrer
- Email: izyan@um.edu.my

Dr. Nusaibah Abd Rahman

- Pharmacy Lecturer
- Email: nusaibah.abdulrahim@um.edu.my

Dr. Inayat Ur Rehman

- Senior Lecturer
- Email: inayat.rehman@um.edu.my

Dr. Kashif Ullah Khan

- Senior Lecturer
- Email: k.khan@um.edu.my

EXECUTIVE AND OPERATION STAFF

	**Madam Ernie Gireen Abdullah** Assistant Registrar (N44) Email: nieg@um.edu.my Tel No. 03-7967 4701		**Madam Nor Nadia Alies** Science Officer (C44) Email: nadya@um.edu.my Tel No. 03-7967 4959
	**Miss Hartini Mohamed** Assistant Registrar (N41) Email: hartini.mohamed@um.edu.my Tel No. 03-7967 5796		**Madam Haryani Azahari** Science Officer (C44) Email: haryani@um.edu.my Tel. No. 03-7967 4959
	**Dr. Chanthiriga A/P Ramasindarum** Research Officer (Q44) Email : chanthi@um.edu.my Tel. No. 03-7967 5796		**Mr. Abdul Rafique Abd Jalal** Science Officer (C44) Email : rafiquejalal@um.edu.my Tel. No. 03-7967 4959
	**Madam Jamilah Osman** Senior Assistant Bursar (W44) Email: nurjamilahosman@um.edu.my Tel : 03-7967 5796		**Madam Rustini Karim** Med. Lab. Technologist (U36) Email : rustini@um.edu.my Tel. No. 03-7967 4959
	**Miss Salmizawati Salim** Med. Lab. Technologist (U32) Email: sal_miza@um.edu.my Tel. No. 03-7967 4959		**Madam Siti Aisah Basari** Med. Lab. Technologist (U32) Email: aisah_basari@um.edu.my Tel. No. 03-7967 4959
	**Madam Noor Akma Kamaruddin** Assistant Science Officer (C29) Email: noorakma@um.edu.my Tel. No. 03-7967 4959		**Madam Nurul Izzati Abdul Wahab** Med. Lab. Technologist (U29) Email: nizzati_aw@um.edu.my Tel No. 03-7967 4959

	**Madam Shuhaida Md Suki** Administrative Assistant (N22) Email : shuhaida@um.edu.my Tel. No. 03-7967 4909		**Madam Nurul Husna Osman** Med. Lab. Technologist (U29) Email:nurulhusnaosman@um.edu.my Tel. No. 03-7967 4959
	**Miss Siti Nur Ezaty Mazlan** Secretary Assistant (N19) Email: ezaty_m@um.edu.my Tel. No. 03-7967 4909		**Madam Masitah Harun** Administrative Assistant (N19) Email: masitah8663@um.edu.my Tel. No. 03-7967 4909
	**Madam Nursheila Khalil** Administrative Assistant (N19) Email : sheila.khalil@um.edu.my Tel. No. 03-7967 4909		**Madam Syamira Azwin Binti Safarudin** Administrative Assistant (N19) Email: syamiraazwin@um.edu.my Tel. No. 03-7967 4909
	**Madam Siti Rohana Osman** Operation Assistant (N14) Email: rohana_osman@um.edu.my Tel. No. 03-7967 4909		**Mr. Norfahmi Izzuddin Ramli** Administrative Assistant (Finance) (W19) Email: fahmiizzuddin@um.edu.my Tel. No. 03-7967 4909
	**Mr. Mohd Fazli Abdul Majid** Operation Assistant (N11) Email: baii@um.edu.my Tel No. 03-7967 4909		**Mr. Amir Faris** Operation Assistant (N11) Email: amir_bowl@um.edu.my Tel No. 03-7967 4909
	**Mr. Mohd Asni Mohamed** Assistant IT Officer (FA29) Email: asni@um.edu.my Tel No. 03-7967 4909		**Mr. Mohd Shazly Bin Mohd Royani** Assistant Engineer (J29) Email: shazly@um.edu.my Tel. No. 03-7967 4909

VISSION, MISSION AND OBJECTIVES

VISION

To be a global eminent faculty in pharmacy education, research and innovation

MISSION

To produce high-quality graduates and research towards enhancement of nation's health and well-being

OBJECTIVES

- To nurture competitive, innovative and highly ethical graduates that effectively contribute to healthcare
- To foster innovative and cutting-edge research to impact human health nationally and globally
- To develop outstanding leaders in healthcare that inspire future tranformation of the society

MOTTO

- EPITOME OF EXCELLENCE

ACADEMIC CALENDAR
2024/2025 ACADEMIC SESSION
(BACHELOR DEGREE LEVEL)

SEMESTER I					
Orientation Week			29.09.2024	-	06.10.2024
Lectures	7	weeks*	07.10.2024	-	24.11.2024
Mid Semester I Break	1	week	25.11.2024	-	01.12.2024
Lectures	7	weeks*	02.12.2024	-	19.01.2025
Revision Week	1	week*	20.01.2025	-	26.01.2025
Semester I Final Examination	3	weeks*	27.01.2025	-	16.02.2025
Semester I Break	4	weeks	17.02.2025	-	16.03.2025
	23	weeks			
SEMESTER II					
Lectures	7	weeks*	17.03.2025	-	04.05.2025
Mid Semester II Break	1	week	05.05.2025	-	11.05.2025
Lectures	7	weeks*	12.05.2025	-	29.06.2025
Revision Week	1	week*	30.06.2025	-	06.07.2025
Semester II Final Examination	3	weeks*	07.07.2025	-	27.07.2025
Semester II Break	4	weeks	28.07.2025	-	24.08.2025
	23	weeks			
SPECIAL SEMESTER					
Lectures	7	weeks*	28.07.2025	-	14.09.2025
Special Semester Final Examination	1	week*	15.09.2025	-	21.09.2025
Break	1	week	22.09.2025		28.09.2025
	9	weeks			

Nota:

(*) The Academic Calendar has taken into account public and festive holidays and is subject to change:

Deepavali	31 October 2024 (Thursday)
Christmas Day	25 December 2024 (Wednesday)
New Year	01 January 2025 (Wednesday)
Chinese New Year	29 & 30 January 2025 (Wednesday & Thursday)
Federal Territory Day	01 February 2025 ((Saturday)
Thaipusam	11 February 2025 (Tuesday)
Nuzul Al-Quran	17 March 2025 (Monday)
Eidul Fitri	31 March & 01 April 2025 (Monday & Tuesday)
Wesak Day	12 May 2025 (Monday)
His Majesty the King's Birthday	02 June 2025 (Monday)
Eidul Adha	06 June 2025 (Friday)
Awal Muharam	27 June 2025 (Friday)

Senate Approval Date: 24.01.2024

PROGRAMME TITLE, PHILOSOPHY, PRINCIPLES, PEO AND PLO

PROGRAMME TITLE

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

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:

(1) 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.
(2) 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.
(3) The education provided is dynamic and farsighted to equip the graduates to face current and future challenges.
(4) Emphasis is given on basic communication and thinking skills as well as the benefits of modern communication technology.

(5) 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 EDUCATIONAL OBJECTIVES (PEO)

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

PROGRAMME LEARNING OUTCOMES (PLO)

PLO1	−	Describe advanced and comprehensive theoretical and technical knowledge in all areas of pharmacy.
PLO2	−	Apply cognitive skills to critically solve pharmaceutical care issues and optimize health outcome.
PLO3	−	Master pharmaceutical practices including dispensing and formulating, manufacturing, and evaluating medicines to meet current and future needs.
PLO4	−	Able to communicate and cooperate effectively as a team member of healthcare professionals.
PLO5	−	Utilise digital information management and numerical skills to foster professional development.
PLO6	−	Demonstrate strong leadership, work autonomously and responsibly within a broad organization.
PLO7	−	Practice lifelong learning to foster personal development, possess management and entrepreneurship skills in the various areas of pharmacy profession.
PLO8	−	Act professionally with integrity in accordance with existing laws and the Code of Ethics for Pharmacists.

ACADEMIC PROGRAMME

PROGRAMME STRUCTURE

Category	Courses Code	Course Name	Credits
University Courses	GIG 1012 / GLT1049	Philosophy and Current Issue or Malay Language Communication*	2
	GIG1013	Appreciation of Ethics and Civilisations	2
	GIG 1003	Basic Entrepreneurship Enculturation	2
	GLT XXXX	English for Communication or Foreign Language Course**	4
	GKX XXXX	Co-Curriculum	4
		Total	**14**
Faculty Core Courses	Programme Core Courses		112
Elective Courses	Programme Elective Courses		8
	Student Holistic Empowerment (SHE)		6
		Grand Total	**140**

Notes:

*For international students only

**Student with MUET band 5 and 6 are given the option to choose either to enrol for English Communication Course or Foreign Language Course

For SHE courses, please refer to CITrA website https://citra.um.edu.my/

COURSE STRUCTURE

YEAR 1						
	SEMESTER I, 2024/2025			SEMESTER II, 2024/2025		
Category	**Course Code**	**Course Name**	**Credit**	**Course Code**	**Course Name**	**Credit**
University Courses	GIG1003	Basic Entrepreneurship Enculturation	2	GLTXXXX	English for Communication or Foreign Language Course**	2
				GIG1012 / GLT1049	Philosophy and Current Issue or Basic Malay Language Communication*	2
Faculty Core Courses	OIA1004	Anatomy and Physiology	3	OIA1003	Biochemistry	3
	OIA1010	Microbiology and Basic Immunology	3	OIA1008	Physical Pharmacy	3
	OIA1011	Basic Pharmaceutical Chemistry	2	OIA1015	Pharmacotherapy for Bacterial Infections	2
	OIA1012	Pharmaceutical Organic Chemistry	2	OIA2004	Pharmacotherapy for Respiratory and Gastrointestinal Disorders	3
	OIA1013	Principles of Drug Actions	3	OIA2007	Pharmacognosy	2
	OIA1014	Introduction to Pharmacotherapy	2			
University Elective Courses (SHE)	-	-	-	SHE/ GQX0056	Integrity and Anti-Corruption (Noted: For Local Student Only	2
Programme Elective Courses	-	-	-	-	-	-
Total			**17**			**19**
	YEAR 1 TOTAL CREDIT: 36					

*For international student only

**Student with MUET band 5 and 6 are given the option to choose either to enrol for English Communication Course or Foreign Language Course

YEAR 2						
	SEMESTER I, 2025/2026			SEMESTER II, 2025/2026		
Category	Course Code	Course Name	Credit	Course Code	Course Name	Credit
University Courses	GLTXXXX	English for Communication or Foreign Language Course**	2	GKXxxxx	Co-curriculum	2
	GIG1013	Appreciation of Ethics and Civilizations	2			
Faculty Core Courses	OIA2002	Pharmaceutical Analysis	3	OIA2006	Chromatography, Electrochemistry and Radiochemistry	2
	OIA2003	Pharmaceutical Dosage Form Design for Liquids and Semisolids	2	OIA2008	Sterile Pharmaceutical Dosage Form Design	2
	OIA2012	Medicinal Chemistry	3	OIA2011	Pharmacotherapy for Cardiovascular Disorders	3
	OIA2013	Pharmacotherapy for Immune Disorders	2	OIA2015	Pharmacotherapy for Psychiatric and Neurological Disorders	3
	OIA2014	Pharmacotherapy for Fungal and Viral Infections	2	OIA3001	Solid Pharmaceutical Dosage Form Design	3
				OIA3022	Clinical Toxicology	2
University Elective Courses (SHE)		SHE	2		SHE	2
Programme Elective Courses	OIAxxxx	Programme Elective	2	-	-	-
Total			20			19
	YEAR 2 TOTAL CREDIT: 39					

YEAR 3						
	SEMESTER I, 2026/2027			SEMESTER II, 2026/2027		
Category	Course Code	Course Name	Credit	Course Code	Course Name	Credit
University Courses	GKXxxxx	Co-curriculum	2	-	-	-
Faculty Core Courses	OIA3005	Pharmacotherapy for Endocrine Disorders	3	OIA3027	Drug Discovery and Development	3
	OIA3015	Ethics and Legislation in Pharmacy	2	OIA3028	Community Pharmacy Practice	3
	OIA3023	Extemporaneous Preparations	3	OIA3029	Hospital Pharmacy Practice	3
	OIA3024	Pharmacoepidemiology and Evidence-Based Pharmacotherapy	2	OIA3030	Principles and Applications of Pharmacokinetics	3
	OIA3025	Pharmaceutical Biotechnology and Personalised Medicine	2	OIA3031	Pharmacotherapy for Specific Population	2
	OIA3026	Pharmacotherapy for Cancer, Pain and Renal Disorders	3	OIA3032	Research Project I	2
University Elective Courses (SHE)	-	-	-	-	-	-
Programme Elective Courses	-	-	-	-	-	-
Total			17			16
	YEAR 3 TOTAL CREDIT: 33					

YEAR 4						
	SEMESTER I, 2027/2028			SEMESTER II, 2027/2028		
Category	Course Code	Course Name	Credit	Course Code	Course Name	Credit
University Courses	-	-	-	-	-	-
Faculty Core Courses	OIA3010	Advanced Pharmaceutical Dosage Form Design	3	OIA4014	Industrial Pharmacy and Regulatory Control	6
	OIA4002	Pharmacoeconomics	2	OIA4015	Clinical Clerkship II	3
	OIA4011	Management Skills for Pharmacists	3			
	OIA4012	Clinical Clerkship I	3			
	OIA4013	Research Project II	6			
University Elective Courses (SHE)	-	-	-	-	-	-
Programme Elective Courses	-	-	-	OIAxxxx	Programme Elective	6
Total			17			15
	YEAR 4 TOTAL CREDIT: 32					

Programme Elective Courses

Course Code	Course Name	Credits
OIA1016	Pharmacoinformatics	2
OIA1017	Nutrition and Health Supplement	3
OIA1019	Pharmaceutical Microbiology	3
OIA1018	Traditional and Complementary Medicine	3
OIA3033	Cosmetic Products	3
OIA3034	Emerging Topics in Pharmacy	3

ENGLISH COMMUNICATION PROGRAMME

ENGLISH COMMUNICATION PROGRAMME (UNIVERSITY COURSE) (KURSUS BAHASA INGGERIS KOMUNIKASI- KURSUS UNIVERSITI) FACULTY OF LANGUAGES AND LINGUISTICS LIST OF COURSES TO BE COMPLETED BY ALL STUDENTS			
PATH 1	***PATH 2***	***PATH 3***	***PATH 4***
MUET BAND 2 • ***IELTS Band 4.0*** • ***TOEFL Paper – Based Test (437 – 473)*** • ***TOEFL Computer – Based Test (123 – 150)*** • ***TOEFL Internet – Based Test (41 – 52)*** • ***PTE (Academic) – (10 – 28)***	***MUET BAND 3*** • ***IELTS Band 4.5 – 5.0*** • ***TOEFL Paper – Based Test (477 – 510)*** • ***TOEFL Computer – Based Test (153 – 180)*** • ***TOEFL Internet – Based Test (53 – 64)*** • ***PTE (Academic) – (29 - 41)***	***MUET BAND 4*** • ***IELTS Band 5.5 – 6.0*** • ***TOEFL Paper – Based Test (513 – 547)*** • ***TOEFL Computer – Based Test (183 – 210)*** • ***TOEFL Internet – Based Test (65-78)*** • ***PTE (Academic) – (42 – 57)*** • ***FCE (B & C)*** • ***GCE A Level (English) (Minimum C)*** • ***IGCSE/GCSE (English) (A, B & C)***	***MUET BAND 5 & BAND 6*** • ***IELTS Band 6.5 – 9.0*** • ***TOEFL Paper – Based Test (550 –677)*** • ***TOEFL Computer – Based Test (213 – 300)*** • ***TOEFL Internet – Based Test (79 –120)*** • ***PTE (Academic) (58 – 90)*** • ***FCE (A)*** • ***GCE A Level (English) (B & A)***
Students need to complete 2 courses(2 courses x 2 credits each) from thisPATH	*Students need to complete 2 courses (2 courses x 2 credits each) from this PATH*	*Students need to complete 2 courses (2 courses x 2 credits each) from this PATH*	*Students need to complete 2 courses (2 coursesx 2 credits each) from this PATH*
COMPULSORY • *GLT1018 – Proficiency in English I*	***COMPULSORY*** • *GLT1021 – Proficiency in English II*	***COMPULSORY*** • *GLT1024 – Proficiency in English III*	• *GLT1027– Advanced OralCommunication** • *GLT1028 – Advanced BusinessWriting**
** ***CHOOSE ONE*** *:* • *GLT1019 – Let's Speak* • *GLT1020 – Fundamental Writing*	** ***CHOOSE ONE*** *:* • *GLT1022 – Speak Up* • *GLT1023 – Effective Workplace Writing*	** ***CHOOSE ONE*** *:* • *GLT1025 – Effective Oral Communication* • *GLT1026 – Writing at the Workplace*	**(Students can only register for one course persemester)*

Notes:
** These courses have prerequisites and students can only register for them after obtaining a PASS in the compulsory course as stipulated in the respective PATH

Student with MUET band 5 and 6 are given the option to choose either to enrol for English Communication Course or Foreign Language Course

LIST OF REFERENCE:

1. MUET - Malaysian University English Test
2. IELTS - International English Language Testing System
3. TOEFL - Test of English as A Foreign Language
4. PTE (ACADEMIC) - Pearson Test of Academic English
5. FCE - Cambridge Assessment English: Frist
6. GCE (A LEVEL) - General Certificate of Education (A Level) University Of Cambridge
7. IGCSE/GCSE - General Certificate of Secondary Education (O Level), University of Cambridge

List of Foreign Language Course

No.	Module	Occurrence	Topic/Title	Capacity
1.	GLT1033	1	BASIC KOREAN LANGUAGE 1	20
2.	GLT1033	2	BASIC KOREAN LANGUAGE 1	20
3.	GLT1033	3	BASIC KOREAN LANGUAGE 1	20
4.	GLT1034	1	BASIC KOREAN LANGUAGE 2	20
5.	GLT1036	1	BASIC PORTUGUESE LANGUAGE 1	20
6.	GLT1036	2	BASIC PORTUGUESE LANGUAGE 1	20
7.	GLT1036	3	BASIC PORTUGUESE LANGUAGE 1	20
8.	GLT1037	1	BASIC PORTUGUESE LANGUAGE 2	20
9.	GLT1038	1	BASIC RUSSIAN LANGUAGE 1	15
10.	GLT1040	1	BASIC SPANISH LANGUAGE 1	16
11.	GLT1040	2	BASIC SPANISH LANGUAGE 1	16
12.	GLT1040	3	BASIC SPANISH LANGUAGE 1	16
13.	GLT1042	1	BASIC THAI LANGUAGE 1	20
14.	GLT1042	2	BASIC THAI LANGUAGE 1	20
15.	GLT1042	3	BASIC THAI LANGUAGE 1	20
16.	GLT1042	4	BASIC THAI LANGUAGE 1	20
17.	GLT1043	1	BASIC THAI LANGUAGE 2	20
18.	GLT1044	1	BASIC TURKISH LANGUAGE	20
19.	GLT1047	1	BASIC VIETNAMESE LANGUAGE I	20
20.	GLT1047	2	BASIC VIETNAMESE LANGUAGE I	20
21.	GLT1047	3	BASIC VIETNAMESE LANGUAGE I	20

COURSE SUMMARY

CORE COURSES

OIA1004 ANATOMY AND PHYSIOLOGY (3 CREDITS)

Learning Outcomes

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

- describe the overall organization, function and anatomy of the human body (cells, tissues, and organs).
- identify anatomical structures of the human body
- illustrate the importance of each of the following systems: endocrine, cardiovascular, lymphatic, digestive, urinary, reproductive, nervous, and respiratory systems
- Relate the fundamentals of homeostasis and its importance in regulating normal human physiology.

Course Synopsis

This course aims to equip students with various concepts of anatomy and physiology that will enable them to discuss the interrelationship between structure and function of the human body and its regulation.

Reference Texts

1. Tortora, G. J. and Bryan H. D. (2020). Principles of Human Anatomy and Physiology (16thed.). John Wiley & Sons, Inc.
2. Guyton, A.C. and Hall, J.E. (2021). Textbook of Medical Physiology W.B. Saunders Co. USA (14th ed.)
3. Pocock, G., Richards, C.D. and Daly, M.B. (2017). Human Physiology (5th ed.). Oxford University Press.
4. Ganong, W.F. (2019). Review of Medical Physiology (26th ed.). McGraw Hill.
5. Noor, N.M. (2014). Illustrated Human Physiology (1st ed.). Pearson.

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%.

OIA1010 MICROBIOLOGY AND BASIC IMMUNOLOGY (3 CREDITS)

Learning Outcomes

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

- identify the classification of bacteria and the basis of antibacterial resistance
- explain the basic of microbiology and parasitology, including their structures, classification, and reproduction
- determine the pathogenesis of microbial and parasitological infections
- apply the basic concepts of immunology
- illustrate the pathophysiology of hypersensitivity reactions and various autoimmune disorders

Course Synopsis

This course provides the knowledge on the various aspects of microbiology and parasitology including common infectious agents in Malaysia (bacteria, fungi, virus, and parasites). Concepts of classifications, diagnosis, brief life cycle, biochemical analysis will be covered. It is an opportunity to learn about aseptic, isolation and identification techniques of micro-organisms and factors that affect its development. Students will also be introduced to the basic concepts of immunology, such as inflammation, antigen and immunogenicity, cold-chain reactions, immunization, hypersensitivity, vaccination, and some common autoimmune disorders.

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.

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA1011 BASIC PHARMACEUTICAL CHEMISTRY (2 CREDITS)

Learning Outcomes

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

- explain the state of matter
- illustrate the principles and concepts associated with gases, liquids, solids, solutions, thermodynamics, and kinetics
- apply the principles and concepts associated with gases, liquids, solids, solutions, thermodynamics and kinetics in pharmaceutical sciences
- perform laboratory experiment to study the principles and concepts associated with gases, liquids, solids, solutions, thermodynamics and kinetics in pharmaceutical sciences

Course Synopsis

This is an introductory course on physical principles used in pharmaceutical sciences. This course emphasizes the importance of physical and chemical properties in relation to the drug's ingredients.

Reference Texts

1. Chang, R. & Goldsby, K. (2016). Chemistry (12th edition). McGraw Hill, New York. ISBN: 9780078021510
2. Florence, A.T., & Attwood, D. (2016). Physicochemical principles of pharmacy: in manufacture, formulation, and clinical use (6th edition). Pharmaceutical Press, London. ISBN: 9780857111746
3. Aulton, M.E., & Taylor, K.M. (2018). Aulton's Pharmaceutics: The Design and Manufacture of Medicines (5th Edition). Elsevier, Edinburgh. ISBN: 9780702070051
4. Sinko, P.J. (2017). Martin’s physical pharmacy and pharmaceutical sciences: physical chemical and biopharmaceutical principles in the pharmaceutical sciences (7th edition). Wolters Kluwer, Philadelphia. ISBN: 9781496353443

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA1012 PHARMACEUTICAL ORGANIC CHEMISTRY (2 CREDITS)

Learning Outcomes

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

- describe the functional groups, organic reactions, names and structure of organic compounds
- explain how organic structures and bonds influence physical and chemical properties of organic compounds
- identify chemical substances in drugs and pharmaceutical usage
- perform synthesis of a simple drug and chemical identification of functional groups in drugs

Course Synopsis

This course explains the overall picture of organic chemistry aspects in determining the important drug characteristics in pharmaceutical analysis and drug actions

Reference Texts

1. McMurry, J. (2015). Organic Chemistry (9th ed.). Thomson-Brooks/Cole, USA
2. Dickson, C. (2017). Experiments in Pharmaceutical Chemistry. (2nd ed.). CRC Press, USA.
3. Headley, A.D. (2019). Organic Chemistry: Concepts and Applications. (1st ed.). Wiley & Sons, Inc USA

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA1013 PRINCIPLES OF DRUG ACTIONS (3 CREDITS)

Learning Outcomes

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

- apply the principles of drug action based on pharmacodynamic and pharmacokinetic concepts
- illustrate the role of agonists and antagonists of the autonomic and somatic nervous systems
- demonstrate the concept of drug action and the autonomic and somatic nervous systems

Course Synopsis

Students will be introduced to the principles of drug actions and covers the important aspects of pharmacokinetics and pharmacodynamics. This module also includes the transmission of autonomic and somatic nerves; covering the mechanisms of action and uses of the major groups of drugs used in medicine.

Reference Texts

1. Katzung B.G. (Ed). (2017). Basic and clinical pharmacology (14th ed.). Appleton & Lange
2. Harvey, series editors (Ed.) (2018). Lippincott's Illustrated Reviews: Pharmacology (7th edition).
3. Goodman & Gilman's. (2018). The Pharmacological Basis of Therapeutics (13th ed.). McGraw-Hill.
4. Rang, H.P., and Dale, M.M (2015). Pharmacology (8th ed.). Churchill Livingstone.
5. Grahame-Smith, D.G & Aronson, J.K. (2001). Oxford Textbook of Clinical Pharmacology and Drug Therapy (3rd edition). Oxford University Press.
6. Lawrence, D.R., Bennet, P.N. & Brown, M.J. (1997). Clinical Pharmacology (8th edition). Churchill Livingstone.

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA1014 INTRODUCTION TO PHARMACOTHERAPY (2 CREDITS)

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

- explain the role of pharmacists in the healthcare system
- describe the pathophysiology and management of fever and haematologic disorders
- explain the mechanism of actions, pharmacokinetic properties, adverse effects and drug-drug interactions used in the management of fever and haematologic disorders
- interpret laboratory test results using the principles of patient management
- solve pharmaceutical care issues regarding haematologic disorders and fever.

Course Synopsis
This module introduces the basic principles of pharmacotherapy, pharmaceutical care, posology and the role of pharmacists in the context of Malaysia's healthcare system. In this module, the pharmacology of drugs used for the management of fever and hematologic disorders will be discussed. Pathophysiology of fever and hematologic disorders will also be emphasized.

Reference Texts

1. Katzung, B. G. (2017). Basic and clinical pharmacology (14th ed). McGraw Hill Education.
2. Ritter, J. M., Flower, R., Henderson, G., Loke, Y. K., MacEwan, D. & Rang, H. P. (2019). Rang and Dale's Pharmacology (9th ed). Elsevier Ltd.
3. Whalen, K. (2018). Lippincott's Illustrated Reviews: Pharmacology (7th ed). Wolters Kluwer.
4. Dipiro, J. T., Talbert, R. L., Yee, G. C., Matzke, G. R., Wells, B. G. & Posey, L. M. (2020). Pharmacotherapy: A Pathophysiologic Approach (11th ed). McGraw Hill Education.
5. Herfindal, E. T., Helms, R. A. & Quan, D. J. (2007). Textbooks of Therapeutics. Drug and Disease management (8th ed). Lippincott's Williams and Wilkins.
6. Zeind, C. S. & Carvalho, M. G. (2018). Koda Kimble & Youngs Applied Therapeutics. The Clinical Use of Drugs (11th ed). Wolters Kluwer.
7. British National Formulary (BNF) [latest edition]. British Medical Association.
8. Drug Information Handbook (latest edition). Lexi-Comp Inc.

Marking and Assessment Methods
Continuous Assessment 40%
Final Examination 60%

OIA1003 BIOCHEMISTRY (3 CREDITS)

Learning Outcomes

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

- describe the chemical classification and metabolism of carbohydrates, lipids and proteins.
- explain the basic concept of cellular bioenergetics and the biochemistry of Enzymes, vitamins and nucleic acids
- relate the various metabolic pathways in human
- relate the biochemical basis of disease and drugs

Course Synopsis

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

Reference Texts

1. Harvey, R. and Ferrier, D. (2022). Lippincott's Illustrated Reviews: Biochemistry, (8th ed). JB Lippincott Company.
2. Devlin, T. (2020). Textbook of Biochemistry with Clinical Correlations, (7th ed).
3. Bender, D.A., Kennelly, P.J., Botham, K.M., Weil, P.A. & Rodwell, V.W. (2022). Harper's Illustrated Biochemistry, (32nd ed).
4. Salway, J.G. (2015). Metabolism at a Glance, (4th ed).

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA1008 PHYSICAL PHARMACY (3 CREDITS)

Learning Outcomes

At the end of the course students are able to:

- describe the concept of dispersed systems, surface phenomena, dissolution, rheology and factors influencing the stability of dispersed systems
- explain the mechanism of action of surface-active agents, rheological properties of pharmaceutical materials, the applications of the dispersed systems, surface phenomena, dissolution testing and rheology in the formulation of pharmaceutical dosage forms
- show stability of dispersed systems, critical micelle concentration, the dissolution rate of a drug, 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.

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA1015 PHARMACOTHERAPY FOR BACTERIAL INFECTIONS (2 CREDITS)

Learning Outcomes

At the end of the course students are able to:

- discuss the pathophysiology and management of bacterial infections of various organ systems, such as cardiovascular, respiratory, urogenital, skin and central nervous system
- explain the mechanism of actions, pharmacokinetic properties, adverse effects and drug interactions of drugs used in the management of infectious diseases caused by bacteria
- interpret laboratory test results with the principles of patient management.
- solve pharmaceutical care issues regarding bacterial infections

Course Synopsis

This module is one of the module series that integrates the pharmacology discipline with clinical pharmacy. In this module, the pharmacology of antimicrobial and the clinical management of infectious diseases caused by bacteria will be discussed. Students will also be introduced to the concept of management of infectious diseases of various organ systems, such as skin, respiratory, cardiovascular and central nervous system

Reference Texts

1. Katzung, B. G. (2017). Basic and clinical pharmacology (14th ed). McGraw Hill Education.
2. Ritter, J. M., Flower, R., Henderson, G., Loke, Y. K., MacEwan, D. & Rang, H. P. (2019). Rang and Dale's Pharmacology (9th ed). Elsevier Ltd.
3. Whalen, K. (2018). Lippincott's Illustrated Reviews: Pharmacology (7th ed). Wolters Kluwer.
4. Dipiro, J. T., Talbert, R. L., Yee, G. C., Matzke, G. R., Wells, B. G. & Posey, L. M. (2020). Pharmacotherapy: A Pathophysiologic Approach (11th ed). McGraw Hill Education.
5. Herfindal, E. T., Helms, R. A. & Quan, D. J. (2007). Textbooks of Therapeutics. Drug and Disease management (8th ed). Lippincott's Williams and Wilkins.
6. Zeind, C. S. & Carvalho, M. G. (2018). Koda Kimble & Youngs Applied Therapeutics. The Clinical Use of Drugs (11th ed). Wolters Kluwer.
7. British National Formulary (BNF) [latest edition]. British Medical Association.
8. Drug Information Handbook (latest edition). Lexi-Comp Inc.

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA2004 PHARMACOTHERAPY FOR RESPIRATORY AND GASTROINTESTINAL DISORDERS (3 CREDITS)

Learning Outcomes

At the end of the course, students will be able to:

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

Course Synopsis

This module is one of a series of modules that integrate the discipline of pharmacology and clinical pharmacy. In this module, the pharmacology of gastrointestinal and respiratory drugs and the 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, asthma and chronic obstructive airway disease (COAD).

Reference Texts

1. Katzung, B. G. (2017). Basic and clinical pharmacology (14th ed). McGraw Hill Education.
2. Ritter, J. M., Flower, R., Henderson. G., Loke Y. K., MacEwan, D. & Rang, H. P. (2019). Rang and Dale's Pharmacology (9th ed). Elsevier Ltd.
3. Whalen, K. (2018). Lippincott's Illustrated Reviews: Pharmacology (7th ed). Wolters Kluwer.
4. Dipiro, J. T., Talbert, R. L., Yee, G.C., Matzke, G. R., Wells, B. G. & Posey, L. M. (2020). Pharmacotherapy: A Pathophysiologic Approach (11th ed). McGraw Hill Education.
5. Herfindal, E. T., Helms, R. A. & Quan, D. J. (2007). Textbooks of Therapeutics. Drug and Disease management (8th ed). Lippincott's Williams and Wilkins.
6. Zeind, C. S. & Carvalho, M. G. (2018). Koda Kimble & Youngs Applied Therapeutics. The Clinical Use of Drugs (11th ed). Wolters Kluwer.
7. British National Formulary (BNF) [latest edition]. British Medical Association.
8. Drug Information Handbook (latest edition). Lexi-Comp Inc

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA2007 PHARMACOGNOSY (2 CREDITS)

Learning Outcomes

At the end of the course students are able to:

- discuss the factors influencing medicinal plant and their cultivation, harvest, storage and deterioration
- recognise the phytochemicals and related metabolic pathways with suitable examples
- illustrate the methods of herbal drug evaluation and standardization
- demonstrate the methods of herbal drug evaluation and standardization.

Course Synopsis

This course provides the overview of potential natural sources of drugs and the development of natural drugs in the form acceptable to the allopathic system of medicine, especially from plants. The relationship between the biogenetic pathways and pharmaceutically important secondary metabolites is explained. The course also emphasizes on the concepts and techniques in standardization of plant drugs, and 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) Heinrich, M., Barnes, J., Gibbons, S. & Williamson, E.M. (2017). Fundamentals of Pharmacognosy and Phytotherapy (3rd ed.). Amsterdam, Netherlands: Elsevier.
2) Wallis,T.E. (2018). Text Book of Pharmacognosy (5th ed.). New Delhi, India: CBS Publishers and Distributors.
3) Kokate, C.K., Gokhale, S.B. & Purohit, A.P. (2019). Pharmacognosy (50th ed.). Pune, India: Nirali Prakashan.
4) McCreath, S.B. & Delgoda, R. (2017). Pharmacognosy: Fundamentals, applications and strategies (1st ed.). Amsterdam, Netherlands: Elsevier.
5) Evans, W.C. (2009). Trease and Evans Pharmacognosy (16th ed.). Amsterdam, Netherlands: Saunders Elsevier

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA2002 PHARMACEUTICAL ANALYSIS (3 CREDITS)

Learning Outcomes

At the end of the course students are able to:

- recognise the concept of monographs and pharmacopoeia standard
- apply the principles of key analytical methods
- perform major analytical methods in structural determination and quality control

Course Synopsis

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

Reference Texts

1) Watson, D.G. (2017). Pharmaceutical Analysis: A textbook for pharmacy students and pharmaceutical chemists (4th ed.). Elsevier, UK.
2) Pavia, D.L., Lampman, G.M., Kriz, G.S. and Vyvyan, J. A. (2015). Introduction to Spectroscopy (5th ed.). Stamford, CT: Cengage Learning, USA.
3) Betageri V.S. and Mugalehalli L.S. (2019). Textbook of Pharmaceutical Chemistry: Analysis of drugs. Lap Lambert Academic Publishing, USA.
4) Goldenberg D.P. (2016). Principles of NMR Spectroscopy: An illustrated guide. (1st ed.). University Science Books, USA.

Marking and Assessment Methods

Continuous Assessment 40%
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:

- illustrate the concepts of formulation and the industrial manufacturing process of liquid and semisolid dosage forms as well as their quality control evaluations.
- formulate liquid and semisolid dosage forms in a laboratory scale
- execute physical quality control evaluations for liquid and semisolid dosage forms

Course Synopsis

The module introduces to the students the overall concept of liquid and semisolid dosage forms. Students will be introduced to equipment used in manufacturing liquid and semisolid dosage forms. Students will prepare liquid and semi-solid dosage forms in a 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.

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA2012 MEDICINAL CHEMISTRY (3 CREDITS)

Learning Outcomes

At the end of the course students are able to:

- explain the biological activity of the major drug classes.
- determine the structure-activity relationships of important drugs in the major drug classes
- build virtual 3-dimensional model for analogue of drug based on their chemical structures with potential enhanced biological activity and reduced toxicity.

Course Synopsis

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

Reference Texts

1. Patrick, G.L. (2017). An Introduction to Medicinal Chemistry. (6th ed.). Oxford University Press, United Kingdom.
2. Chackalamannil, S., Rotella, D., Ward, S. (2017). Comprehensive Medicinal Chemistry III. (3rd ed.). Elsevier.
3. Petitjean, M., & Camproux, A. C. (2016). In Silico Medicinal Chemistry: Computational Methods to Support Drug Design. Edited by Nathan Brown. ChemMedChem, 11(13), 1480-1481.

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA2013 PHARMACOTHERAPY FOR IMMUNE DISORDERS (2 CREDITS)

Learning Outcomes

At the end of the course students are able to:

- describe the pathophysiology and the management of various autoimmune disorders
- explain the mechanisms of action, pharmacokinetic properties, adverse effects and drug interactions of drugs used in various autoimmune disorders
- interpret laboratory test results with the principles of patient management
- solve pharmaceutical care issues for these disorders

Course Synopsis

This module is one of a series of modules that integrate 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.

Reference Texts

1. Katzung, B., Masters, S., & Trevor, A. (2017). Basic and Clinical Pharmacology (14th ed.). McGraw Hill.
2. Brunton, L., Chadner, B., & Knollman, B. (2017). Goodman and Gilman's The Pharmacological Basis of Therapeutics (13th ed.). McGraw Hill.
3. Rang, H., & Dale, M. (2019). Rang and Dale Pharmacology (9th ed.). Elsevier.
4. Dipiro, J.T., Talbert, R.L., Yee, G.C., & Matzke, G.R. (2016). Pharmacotherapy: A Pathophysiologic Approach (10th 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.

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA2014 PHARMACOTHERAPY FOR FUNGAL AND VIRAL INFECTIONS (2 CREDITS)

Learning Outcomes

At the end of the course students are able to:

- discuss the pathophysiology and management of infectious diseases caused by viruses and fungi
- explain the mechanisms of action, pharmacokinetic properties, adverse effects and drug interactions of drugs used in infectious diseases caused by viruses and fungi.
- interpret laboratory test results with the principles of patient management.
- solve pharmaceutical care issues involving viral and fungal infectious diseases.

Course Synopsis

This module is one of the series of modules that integrate the discipline of pharmacology and clinical pharmacy. In this module, the pharmacology of antivirals and antifungals and the clinical management of infectious diseases caused by viruses and fungi will be discussed.

Reference Texts

1. Katzung, B. G. (2017). Basic and clinical pharmacology (14th ed). McGraw Hill Education.
2. Ritter, J. M., Flower, R., Henderson. G., Loke Y. K., MacEwan, D. & Rang, H. P. (2019). Rang and Dale's Pharmacology (9th ed). Elsevier Ltd.
3. Whalen, K. (2018). Lippincott's Illustrated Reviews: Pharmacology (7th ed). Wolters Kluwer.
4. Dipiro, J. T., Talbert, R. L., Yee, G.C., Matzke, G. R., Wells, B. G. & Posey, L. M. (2020). Pharmacotherapy: A Pathophysiologic Approach (11th ed). McGraw Hill Education.
5. Herfindal, E. T., Helms, R. A. & Quan, D. J. (2007). Textbooks of Therapeutics. Drug and Disease management (8th ed). Lippincott's Williams and Wilkins.
6. Zeind, C. S. & Carvalho, M. G. (2018). Koda Kimble & Youngs Applied Therapeutics. The Clinical Use of Drugs (11th ed). Wolters Kluwer.
7. British National Formulary (BNF) [latest edition]. British Medical Association.
8. Drug Information Handbook (latest edition). Lexi-Comp Inc.

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA2006 CHROMATOGRAPHY, ELECTROCHEMISTRY AND RADIOCHEMISTRY (2 CREDITS)

Learning Outcomes

At the end of the course students are able to:

- explain the use of electrochemistry concepts in pharmaceutical analysis.
- apply the principles of chromatography
- perform chromatography separation techniques.
- apply the concepts of radiochemistry Pharmacy.

Course Synopsis

This course is a continuation from the pharmaceutical analysis to introduce analytical principles and techniques that are used in drug quality control and dosage design and research and development.

Reference Texts

1. Joshi, M. & Desai, D. (2019). An introduction to chromatography techniques. Lap Lambert Academic Publishing, USA
2. Fried, B. and Sherma J. (2017). Practical Thin-layer chromatography: A multidisciplinary approach. (1st ed.). CRC Press, USA
3. McNair, H.M., Miller, J.M., Snow N.H. (2019). Basic Gas Chromatography. (3rd ed.). John Wiley and Sons, New Jersey
4. Fanali, S., Haddad P.R., Poole, C. and Riekkola M-L. (2017). Liquid chromatography: Fundamentals and instrumentation. (2nd ed.). Elsevier, USA
5. Lewis J.S, Windhorst, A.D. and Zeglis, B.M. (2019). Radiopharmaceutical chemistry (1st ed.). Springer, Germany
6. Blanc, M. (2017). The elements of electro-chemistry. Forgotten books, USA.

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA2008 STERILE PHARMACEUTICAL DOSAGE FORM DESIGN (2 CREDITS)

Learning Outcomes

At the end of the course students are able to:

- examine the concept of sterile dosage forms, industrial manufacturing process and process control of sterile dosage forms
- demonstrate the ability to prepare and evaluate sterile pharmaceutical dosage form extemporaneously using an aseptic technique
- 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 equipment used in manufacturing and the requirement of the manufacturing plant for sterile dosage forms. Students will be given the chance to use the equipment available for practical in preparation of this dosage form. Students will do hands-on quality control tests and extemporaneous preparation of sterile dosage forms.

Reference Texts

1. Taylor, K. & Aulton, M. (Eds). (2018). Aulton's Pharmaceutics: The design and manufacture of medicines (5th ed.), Edinburgh, UK: Elsevier.
2. Allen, L.V., Popovich, N.G. & Ansel, H.C. (2017). Ansel's pharmaceutical dosage forms and drug delivery systems (11th ed.). Philadelphia, USA. Wolters Kluwer Health.
3. British Pharmacopoeia. (2020), UK. British pharmaceutical commission
4. United States Pharmacopoeia 42-NF 37. (2019). Rockville, USA. United States Pharmaceutical commission.
5. Khar, R.K. & Vyas, S.P. (2015). Lachman/Lieberman's The theory and practice of industrial pharmacy (4th ed.). New Delhi, India. CBS Publishers and Distributers.
6. Martindale: The Complete Drug Reference. (2017). 39th Edition. UK. Pharmaceutical Press.
7. Sheskey, P.J., Cook, W.G. & Cable, C.G. (2017). Handbook of pharmaceutical excipients (8th ed.). UK. Pharmaceutical Press.
8. Pharmaceutical Inspection Co-operation Scheme. Good Manufacturing Practice guidelines. (2018). PIC/S Secretariat, Geneva: Pharmaceutical Inspection Convention.

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA2011 PHARMACOTHERAPY FOR CARDIOVASCULAR DISORDERS (3 CREDITS)

Learning Outcomes

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

- describe the pathophysiology and management of cardiovascular and cerebrovascular disorders
- explain the mechanisms of action, pharmacokinetic properties, adverse effects and drug interactions of drugs used in cardiovascular and cerebrovascular disorders
- interpret laboratory test results with the principles of patient management
- solve pharmaceutical care issues for these disorders
- perform experiment to analyse homeostatic response by the cardiovascular system

Course Synopsis

This module is one of a series of modules that integrate the discipline of pharmacology and clinical pharmacy. In this module, the 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.

Reference Texts

1. Katzung, B. G. (2017). Basic and clinical pharmacology (14th ed). McGraw Hill Education.
2. Ritter, J. M., Flower, R., Henderson. G., Loke Y. K., MacEwan, D. & Rang, H. P. (2019). Rang and Dale's Pharmacology (9th ed). Elsevier Ltd.
3. Whalen, K. (2018). Lippincott's Illustrated Reviews: Pharmacology (7th ed). Wolters Kluwer.
4. Dipiro, J. T., Talbert, R. L., Yee, G.C., Matzke, G. R., Wells, B. G. & Posey, L. M. (2020). Pharmacotherapy: A Pathophysiologic Approach (11th ed). McGraw Hill Education.
5. Herfindal, E. T., Helms, R. A. & Quan, D. J. (2007). Textbooks of Therapeutics. Drug and Disease management (8th ed). Lippincott's Williams and Wilkins.
6. Zeind, C. S. & Carvalho, M. G. (2018). Koda Kimble & Youngs Applied Therapeutics. The Clinical Use of Drugs (11th ed). Wolters Kluwer.
7. British National Formulary (BNF) [latest edition]. British Medical Association.
8. Drug Information Handbook (latest edition). Lexi-Comp Inc.

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA2015 PHARMACOTHERAPY FOR PSYCHIATRIC AND NEUROLOGICAL DISORDERS (3 CREDITS)

Learning Outcomes

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

- describe the pathophysiology and management of psychiatric and neurological disorders
- explain the mechanisms of action, pharmacokinetic properties, adverse effects and drug interactions of drugs used in psychiatric and neurological disorders
- interpret laboratory test results with the principles of patient management
- solve pharmaceutical care issues for psychiatric and neurological disorders

Course Synopsis

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

Reference Texts

1. Katzung, B. G. (2017). Basic and clinical pharmacology (14th ed). McGraw Hill Education.
2. Ritter, J. M., Flower, R., Henderson. G., Loke Y. K., MacEwan, D. & Rang, H. P. (2019). Rang and Dale's Pharmacology (9th ed). Elsevier Ltd.
3. Whalen, K. (2018). Lippincott's Illustrated Reviews: Pharmacology (7th ed). Wolters Kluwer.
4. Dipiro, J. T., Talbert, R. L., Yee, G.C., Matzke, G. R., Wells, B. G. & Posey, L. M. (2020). Pharmacotherapy: A Pathophysiologic Approach (11th ed). McGraw Hill Education.
5. Herfindal, E. T., Helms, R. A. & Quan, D. J. (2007). Textbooks of Therapeutics. Drug and Disease management (8th ed). Lippincott's Williams and Wilkins.
6. Zeind, C. S. & Carvalho, M. G. (2018). Koda Kimble & Youngs Applied Therapeutics. The Clinical Use of Drugs (11th ed). Wolters Kluwer.
7. British National Formulary (latest edition). British Medical Association.
8. Drug Information Handbook (latest edition). Lexi-Comp's Clinical Reference Library.

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA3001 SOLID PHARMACEUTICAL DOSAGE FORM DESIGN (3 CREDITS)

Learning Outcomes

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

- explain the concept of solid dosage forms and industrial manufacturing process and process control
- formulate solid dosage forms based on the concepts of industrial manufacturing process and process control
- develop the ability to produce pilot scale manufacturing of solid dosage forms
- display the ability to lead the group to resolve the problem independently during PBL session
- perform compendial and non-compendial quality control (QC) tests for solid dosage forms.

Course Synopsis

Student will be introduced to the overall concept and characteristics of solid pharmaceutical dosage form. Student will be introduced to all basic equipment 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. Student will be also trained to do quality control tests of solid dosage forms.

Reference Texts

1. Taylor, K. & Aulton, M. (Eds). (2018). Aulton's Pharmaceutics: The design and manufacture of medicines (5th ed.), Edinburgh, UK: Elsevier.
2. Adejare, A. (Ed.). (2020). Remington: The science and practice of pharmacy (23rd ed.). Philadelphia, PA, USA: Academic press.
3. Allen, L.V., Popovich, N.G. & Ansel, H.C. (2017). Ansel's pharmaceutical dosage forms and drug delivery systems (11th ed.). Philadelphia, USA. Wolters Kluwer Health.
4. British Pharmacopoeia. (2020), UK. British pharmaceutical commission.
5. United States Pharmacopoeia 42-NF 37. (2019). Rockville, USA. United States Pharmaceutical commission.
6. Khar, R.K. & Vyas, S.P. (2015). Lachman/Lieberman's The theory and practice of industrial pharmacy (4th ed.). New Delhi, India. CBS Publishers and Distributers.
7. Martindale: The Complete Drug Reference. (2017). 39th Edition. UK. Pharmaceutical Press.
8. Sheskey, P.J., Cook, W.G. & Cable, C.G. (2017). Handbook of pharmaceutical excipients (8th ed.). UK. Pharmaceutical Press.

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA3022 CLINICAL TOXICOLOGY (2 CREDITS)

Learning Outcomes

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

- explain the basic principles of toxicology
- describe the mechanisms, clinical manifestations and management for each type of poisoning
- interpret laboratory test results with the principles of patient management
- solve pharmaceutical care issues associated with poisoning cases.

Course Synopsis

This module introduces students to the basic principles of toxicology. Students will be exposed to the field of clinical toxicology, the area of toxicology that is most relevant to a pharmacist.

Reference Texts

1. Klaassen, C. D. (2018). Casaret & Doull'sToxicology: The basic science of poisons (9th edition). New York: McGraw-Hill Medical.
2. Phillips, L. W., Robert, C. J., Stephen, M. R. (2015). Principles of toxicology: Environmental and Industrial Applications (3rd edition). Wiley-Interscience Publication, John Wiley & Sons. Inc.
3. Gossel, T. A. (2018). Principle of Clinical Toxicology (3rd edition). CRC Press.
4. Barile, F. A. (2019). Barile's Clinical Toxicology: Principles and Mechanisms, (3rd edition). Taylor & Francis Inc.
5. Olson, K. R. (2017). Poisoning and Drug Overdose (7th Edition). Mc Graw Hill Medical Education

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA3005 PHARMACOTHERAPY FOR ENDOCRINE DISORDERS (3 CREDITS)

Learning Outcomes

At the end of the course, students will be able to:

- describe the pathophysiology and management of endocrine and metabolic disorder
- perform experiment to analyse homeostatic response by the endocrine system
- explain the mechanisms of action, pharmacokinetic properties, adverse effects and drug interactions of drugs used in endocrine and metabolic disorders
- interpret laboratory test results with the principles of patient management
- solve pharmaceutical care issues for these disorders.

Course Synopsis

This module is one of a series of modules that integrate 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. Katzung, B., Masters, S., & Trevor, A. (2017). Basic and Clinical Pharmacology (14th ed.). McGraw Hill.
2. Brunton, L., Chadner, B., & Knollman, B. (2017). Goodman and Gilman's The Pharmacological Basis of Therapeutics (13th ed.). McGraw Hill.
3. Rang, H., & Dale, M. (2019). Rang and Dale Pharmacology (9th ed.). Elsevier.
4. Dipiro, J.T., Talbert, R.L., Yee, G.C., & Matzke, G.R. (2016). Pharmacotherapy: A Pathophysiologic Approach (10th 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.

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA3015 ETHICS AND LEGISLATION IN PHARMACY (2 CREDITS)

Learning Outcomes

At the end of the course, the students will be able to:

- apply the various pharmacy legislation on business of pharmacy
- apply the requirement of regulatory authority on different pharmaceutical product in Malaysia
- perform enforcement and court presentation on pharmacy cases related with Malaysian Pharmacy Legislation
- provide advice to other professional and the general public on legislation of drug and pharmaceutical in Malaysia
- practice 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. Poisons act 1952 and its regulations. (2019). Kuala Lumpur: International Law Book Service
2. Poisons act (advertisements and sales) 1956 and its regulations. (2019). Kuala Lumpur: International Law Book Service
3. Drug sales act 1952 and its regulations. (2019). Kuala Lumpur: International Law Book Service
4. Pharmacist registration act 1951 and its regulations. (2019). Kuala Lumpur: International Law Book Service
5. Dangerous drug acts 1952 and its regulations. (2019). Kuala Lumpur: International Law Book Service
6. Code of Ethics for Pharmacists. (2018). Pharmacy Board of Malaysia, Ministry Health of Malaysia.
7. Malaysian National Medicine Policy (2012). (2nd ed.). Ministry Health of Malaysia.
8. Good Governance for Medicine. (2009). (1st ed.). Pharmaceutical Service Division, Ministry Health of Malaysia.

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA3023 EXTEMPORANEOUS PREPARATIONS (3 CREDITS)

Learning Outcomes

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

- demonstrate the ability to interpret prescriptions
- perform calculations to prepare extemporaneous preparations
- prepare extemporaneous preparations following standards from BNF and BPC
- demonstrate 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 of the prescriptions. Methods of dosage calculation, dispensing instructions and labelling of extemporaneous preparations are also included.

Reference Texts

1. Taylor, K. & Aulton, M. (Eds). (2018). Aulton's Pharmaceutics: The design and manufacture of medicines (5th ed.), Edinburgh, UK: Elsevier.
2. British National Formulary 78. (2019). London. The Pharmaceutical Press.
3. Carter, S.J. (2018). Cooper & Gunn's Dispensing for pharmaceutical students (12th ed.). New Delhi, India: CBS Publishers and Distributers.
4. British Pharmaceutical Codex. (2012). London, UK: The Pharmaceutical Press.
5. Martindale: The Complete Drug Reference. (2017). 39th Edition. UK. Pharmaceutical Press.
6. Adejare, A. (Ed.). (2020). Remington: The science and practice of pharmacy (23rd ed.). Philadelphia, PA, USA: Academic press.
7. Allen, L.V., Popovich, N.G. & Ansel, H.C. (2017). Ansel's pharmaceutical dosage forms and drug delivery systems (11th ed.). Philadelphia, USA. Wolters Kluwer Health.
8. Stokton, S.J. & Ansel, H.C. (2016). Pharmaceutical Calculations (15tth ed.). Philadelphia, USA: Lippincott, William & Wilkins.

Marking and Assessment Methods

Continuous Assessment 70%
Final Examination 30%

OIA3024 PHARMACOEPIDEMIOLOGY AND EVIDENCE-BASED PHARMACOTHERAPY (2 CREDITS)

Learning Outcomes

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

- interpret the statistical test results in research
- apply the knowledge of pharmacoepidemiology in relation to pharmacy and public health
- critically appraise a scientific paper.

Course Synopsis

This module will introduce biostatistical and epidemiological concepts necessary for the interpretation, evaluation, and communication particularly applicable to biomedical health sciences. Data analysis using SPSS will be an essential component of the module. This course will also introduce students to evidence-based-medicine and the steps involved in the critical appraisal of a scientific paper.

Reference Texts

1. Dawson, B. (2019). Basic & clinical biostatistics, (5th ed). New York: McGraw-Hill.
2. Pagano, M. (2018). Principles of biostatistics, (2nd ed). Pacific Grove, CA: Duxbury.
3. Strom, B. L., Kimmel, S. E. & Hennessy, S. (Eds). (2019). Pharmacoepidemiology, (6th ed). Oxford, UK: Wiley-Blackwell.
4. Celentano, D. D. & Szklo, M. (2018). Epidemiology, Gordis, (6th ed). Elsevier.
5. Bootland, D., Coughlan, E., Galloway, R., Goubet, S., & McWhirter, E. (2017). Critical Appraisal from Papers to Patient: A Practical Guide, (1st ed). CRC Press.
6. Greenhalgh, T. (2019). How to Read a Paper: The Basics of Evidence-based Medicine and Healthcare, (6th ed). Wiley-Blackwell.
7. Articles given during lectures.

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA3025 PHARMACEUTICAL BIOTECHNOLOGY AND PERSONALISED MEDICINE (2 CREDITS)

Learning Outcomes

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

- describe the basics and procedures of recombinant DNA technology
- describe the production, purification, quality control and formulation of therapeutic protein
- apply pharmacogenomics concept and techniques in therapeutics and clinical setting
- apply novel therapeutic concepts that is based on biotechnology

Course Synopsis

This module will expose the students to the development and application of biotechnology in pharmaceutical sciences with emphasis on the discovery of novel drugs and the production of therapeutic proteins and concept of pharmacogenomics and personalized medicine.

Reference Texts

1. Crommelin, D.J.A., Sindelar, R.D. and Meibohm, B. (2019). Pharmaceutical Biotechnology: Fundamentals and Applications (5th ed.). Springer, New York.
2. Groves, M.J. (Ed.). (2019). Pharmaceutical Biotechnology (2nd ed.). CRC Press, UK.
3. Kayser, O. and Warzecha, H. (Eds.). (2012). Pharmaceutical Biotechnology: Drug Discovery and Clinical Applications (2nd ed.). Wiley-Blackwell, UK.

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA3026 PHARMACOTHERAPY FOR CANCER, PAIN AND RENAL DISORDERS (2 CREDITS)

Learning Outcomes

At the end of the course, students will be able to:

- describe the pathophysiology and management of cancer, pain and renal disorders
- explain the mechanisms of action, pharmacokinetic properties, adverse effects and drug interactions of drugs used in management of cancer, pain and renal disorders
- interpret laboratory test results based on the principles of patient management
- design pharmaceutical care plans that are relevant to these disorders.

Course Synopsis

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

Reference Texts

1. Katzung, B. G. (2017). Basic and clinical pharmacology (14th ed). McGraw Hill Education.
2. Ritter, J. M., Flower, R., Henderson. G., Loke Y. K., MacEwan, D. & Rang, H. P. (2019). Rang and Dale's Pharmacology (9th ed). Elsevier Ltd.
3. Whalen, K. (2018). Lippincott's Illustrated Reviews: Pharmacology (7th ed). Wolters Kluwer.
4. Dipiro, J. T., Talbert, R. L., Yee, G.C., Matzke, G. R., Wells, B. G. & Posey, L. M. (2020). Pharmacotherapy: A Pathophysiologic Approach (11th ed). McGraw Hill Education.
5. Herfindal, E. T., Helms, R. A. & Quan, D. J. (2007). Textbooks of Therapeutics. Drug and Disease management (8th ed). Lippincott's Williams and Wilkins.
6. Zeind, C. S. & Carvalho, M. G. (2018). Koda Kimble & Youngs Applied Therapeutics. The Clinical Use of Drugs (11th ed). Wolters Kluwer.
7. British National Formulary (BNF) [latest edition]. British Medical Association.
8. Drug Information Handbook (latest edition). Lexi-Comp Inc.

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA3027 DRUG DISCOVERY AND DEVELOPMENT (3 CREDITS)

Learning Outcomes

At the end of the course students are able to:

- describe the process and recent challenges of drug discovery and development
- demonstrate a basic knowledge on the use of computational tools as one of the methods for drug discovery
- explain laboratory experiment related to drug discovery and development
- explain the safety evaluations, ethics of human and animal experimentation, intellectual property and commercial considerations in drug development.

Course Synopsis

This course explains the drug development process from bench to bedside. It covers the overview of drug discovery and development processes, drug targets selection and validation, lead identification and modification, the use of computer-aid methods for drug design, pre-clinical testing, pre-formulation, clinical testing, ethics of human and animal experimentation, intellectual property and commercial considerations.

Reference Texts

1. Rang, H. P., Dale, M. M., Ritter, J. M., & Moore, P. K. (2016). Pharmacology. London: Churchill Livingstone.
2. Brunton, L. L., Chabner, B. A. & Knollmann, B. C. (2013). Goodman & Gilman's pharmacological basis of therapeutics. New York: McGraw-Hill Education.
3. Allen Y. (2017). Ansel's pharmaceutical dosage forms and drug delivery systems. Philadelphia: Lippincott Williams & Wilkins.
4. Sinko, P. J. (2017). Martin's physical pharmacy and pharmaceutical sciences. Philadelphia: Walters Kluwer Health.
5. International Conference on Harmonisation (ICH) guideline.

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA3028 COMMUNITY PHARMACY PRACTICE (3 CREDITS)

Learning Outcomes

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

- solve common health problems presented at community pharmacies
- design health promotional material for the public
- interpret screening tests commonly carried out by the community pharmacies
- perform ethical and legal pharmacy practice in supply of medicines

Course Synopsis

Various roles and responsibilities of a community pharmacist will be introduced in this module. First of all, the general structure and management of a community pharmacy including benchmarking requirements will also be discussed. Services provided by community pharmacists such as medication review services, primary care services, health promotion and screening tests offered by the community pharmacists will be emphasized. Some common minor health ailments and general principles of responding to symptoms in a community pharmacy will be taught using cases presented to community pharmacies. Methods of counselling and interactions between patients and pharmacists as well as communication skills of a community pharmacist will be emphasized. Students will also be attached to community pharmacies to experience the roles of a community pharmacist.

Reference Texts

1. British National Formulary (BNF), British Medical Association (latest edition).
2. MIMS, CMPMedica Pacific Ltd., Malaysia (latest edition).
3. Drug Information Handbook. Lexi-Comp's Clinical Reference Library (latest edition).
4. Chua S S, Lee M H G, Hoe S L and Paraidathathu T. Community Pharmacy Practice in Malaysia, University of Malaya Press, 2016.
5. Pharmaceutical Services Division Ministry of Health Malaysia. Community Pharmacy Benchmarking Guideline 2016.
6. Blenkinsopp, A., & Paxton, P., (2018). Symptoms in the Pharmacy: A Guide to the Management of Common Illness. (8th ed.) Blackwell Scientific Publications.
7. Handbook of Nonprescription Drugs, American Pharmacists Association.
8. Pharmaceutical Services Division, Ministry of Health Malaysia. Guide to Good Dispensing Practice 2016.
9. Haughey S & O'Hare R. Pharmacy OSCES and competency-based assessment. Elsevier. 2018 (ISBN: 978-0-7020-6701-3).
10. Evans B. W. et al. Pharmacy OSCEs: A Revision Guide. Pharmaceutical press. 2016 (ISBN: 978-0-85711-0435).

Marking and Assessment Methods

Continuous Assessment 100%

OIA3029 HOSPITAL PHARMACY PRACTICE (3 CREDITS)

Learning Outcomes

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

- explain the various roles of a hospital pharmacist and the various services provided in a hospital pharmacy
- perform effective prescription screening and intervention, labelling/ worksheet preparation, filing/ reconstitution, counter checking process and dispensing of medicines
- perform effective oral and written communication professionally
- perform ethical and legal pharmacy practice in supply of medicines

Course Synopsis

The roles of hospital pharmacists will be explained in detail. The general structure and management of a hospital pharmacy will also be discussed. Students will be trained to check prescriptions thoroughly, to do interventions and to prevent medication errors. Emphasis will be placed on therapeutic uses of drugs, abnormal doses, drug-drug interactions and contraindications. Methods of labelling, counselling and interactions between a pharmacist with patients and doctors will be emphasized through practical. This module also involves attachment of students to a hospital pharmacy where the student will be familiarized with the roles of pharmacists in the hospital and know the activities or services provided.

Reference Texts

1. British National Formulary (BNF), British Medical Association, latest edition
2. MIMS, CMPMedica Pacific Ltd., Malaysia, latest edition.
3. Drug Information Handbook. Lexi-Comp's Clinical Reference Library, latest edition.
4. Holford DA, Brown TR (2010). Introduction to Hospital and Health-System Pharmacy Practice (1st edition.). American Society of Health-System Pharmacists.
5. Stephens M (2011). Hospital Pharmacy (2nd edition). Pharmaceutical Press.
6. Pharmaceutical Services Division, Ministry of Health Malaysia (2016). Guide to Good Dispensing Practice.
7. Pharmaceutical Services Division, Ministry of Health Malaysia (2010). Guidelines for Inpatient Pharmacy Practice.
8. Pharmaceutical Services Division, Ministry of Health Malaysia (2019). *Garis Panduan Kaunseling Ubat-ubatan (3rd edition).*

Marking and Assessment Methods

Continuous Assessment 100%

OIA3030 PRINCIPLES AND APPLICATIONS OF PHARMACOKINETICS (3 CREDITS)

Learning Outcomes

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

- explain the different approaches in pharmacokinetic analyses
- interpret the dosing regimen and time course of drug concentration data in relation to pharmacokinetic parameters
- propose patient-specific dosing regimens based on derived pharmacokinetic parameters.

Course Synopsis

This course 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. Beringer P. M. (2017). Winter's Basic Clinical Pharmacokinetics (6th edition). Lippincott Williams & Wilkins.
2. Bauer, L. A. (2014). Applied Clinical Pharmacokinetics (3rd edition). McGraw-Hill Education.
3. Murphy, J., & American Society of Health-System Pharmacists (2017). Clinical pharmacokinetics (6th edition). Bethesda, MD: American Society of Health-System Pharmacists.
4. Venkateswarlu, V. (2015). Biopharmaceutics and Pharmacokinetics (2nd edition). PharmaMed Press.
5. Shargel, L et al. (2016). Applied Biopharmaceutics & Pharmacokinetics (7th edition). McGraw-Hill Education.
6. Pharmaceutical Services Division, Ministry of Health Malaysia (2019). Clinical Pharmacokinetics Pharmacy Handbook (2nd edition.

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA3031 PHARMACOTHERAPY FOR SPECIFIC POPULATION (2 CREDITS)

Learning Outcomes

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

- discuss the pathophysiology and management of disorders affecting specific population
- explain the mechanisms of action, pharmacokinetic properties, adverse effects and drug interactions of drugs used for disorders affecting specific population
- interpret laboratory test results with the principles of patient management involving disorders affecting specific population
- develop solutions for pharmaceutical care issues involving disorders affecting specific population

Course Synopsis

This module is one of a series of modules that integrate the discipline of pharmacology and clinical pharmacy. In this module, the pharmacokinetic and pharmacodynamic changes that occur in special type of population, such as neonates, paediatric, geriatric, and pregnant patients will be covered. Management of specific health-related problems such as benign prostatic hyperplasia and erectile dysfunction will also be given emphasis.

Reference Texts

1) Katzung, B. G. (2017). Basic and clinical pharmacology (14th ed). McGraw Hill Education.
2) Ritter, J. M., Flower, R., Henderson. G., Loke Y. K., MacEwan, D. & Rang, H. P. (2019). Rang and Dale's Pharmacology (9th ed). Elsevier Ltd.
3) Whalen, K. (2018). Lippincott's Illustrated Reviews: Pharmacology (7th ed). Wolters Kluwer.
4) Dipiro, J. T., Talbert, R. L., Yee, G.C., Matzke, G. R., Wells, B. G. & Posey, L. M. (2020). Pharmacotherapy: A Pathophysiologic Approach (11th ed). McGraw Hill Education.
5) Herfindal, E. T., Helms, R. A. & Quan, D. J. (2007). Textbooks of Therapeutics. Drug and Disease management (8th ed). Lippincott's Williams and Wilkins.
6) Zeind, C. S. & Carvalho, M. G. (2018). Koda Kimble & Youngs Applied Therapeutics. The Clinical Use of Drugs (11th ed). Wolters Kluwer.
7) British National Formulary (BNF) [latest edition]. British Medical Association.
8) Drug Information Handbook (latest edition). Lexi-Comp Inc.

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA3032 RESEARCH PROJECT I (2 CREDITS)

Learning Outcomes

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

- recognise the basic principles of research, various types of research and the importance of research ethics.
- manage relevant information from multiple sources.
- produce a written research proposal.
- perform an oral proposal presentation.
- produce a progress report.

Course Synopsis

Students will be introduced to various types of research, for 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 next coming semester.

Reference Texts

1. Ecarnot, F., Seronde, M. F., Chopard, R., Schiele, F., & Meneveau, N. (2015). Writing a scientific article: A step-by-step guide for beginners. European Geriatric Medicine, 6(6), 573-579
2. Creswell, J. W., & Creswell, J. D. (2017). Research design: Qualitative, quantitative, and mixed methods approach. Sage publications.

Marking and Assessment Methods

Continuous Assessment 100%

OIA3010 ADVANCED PHARMACEUTICAL DOSAGE FORM DESIGN (3 CREDITS)

Learning Outcomes

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

- identify advanced dosage forms which are new in the market and those in research stage
- illustrate the use of various types of polymers in the formulation of advanced dosage forms
- formulate slow release or sustained release or targeted release dosage forms and or those suitable for macromolecular delivery
- advise on the types and usage of advanced dosage forms to other healthcare professionals and the public
- recognise the potential of local materials for research into the use in advance dosage form.

Course Synopsis

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

Reference Texts

1. Taylor, K. & Aulton, M. (Eds). (2018). Aulton's Pharmaceutics: The design and manufacture of medicines (5th ed.), Edinburgh, UK: Elsevier.
2. Adejare, A. (Ed.). (2020). Remington: The science and practice of pharmacy (23rd ed.). Philadelphia, PA, USA: Academic press.
3. Allen, L.V., Popovich, N.G. & Ansel, H.C. (2017). Ansel's pharmaceutical dosage forms and drug delivery systems (11th ed.). Philadelphia, USA. Wolters Kluwer Health.
4. British Pharmacopoeia. (2020), UK. British pharmaceutical commission.
5. United States Pharmacopoeia 42-NF 37. (2019). Rockville, USA. United States Pharmaceutical commission.
6. Khar, R.K. & Vyas, S.P. (2015). Lachman/Lieberman's The theory and practice of industrial pharmacy (4th ed.). New Delhi, India. CBS Publishers and Distributers.
7. Martindale: The Complete Drug Reference. (2017). 39th Edition. UK. Pharmaceutical Press.
8. Sheskey, P.J., Cook, W.G. & Cable, C.G. (2017). Handbook of pharmaceutical excipients (8th ed.). UK. Pharmaceutical Press.

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA4002 PHARMACOECONOMICS (2 CREDITS)

Learning Outcomes

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

1) explain various methods of economic evaluations of evidence-based healthcare interventions.
2) determine various types of costs that relate to different perspectives used in economic evaluations of evidence-based healthcare interventions.
3) critically appraise economic evaluations of health care interventions to guide evidence-based healthcare decision making.

Course Synopsis

This module will apply key principles of pharmacoeconomics to economic evaluations of evidence-based healthcare interventions. The use of data from economic evaluations of healthcare interventions to inform evidence-based healthcare decision-making will be discussed.

Reference Texts

1. Drummond, M.F., Sculpher, M.J., Torrance, G.W., O'Brien, B.J., Stoddart, G.L. (2015). Methods for the Economic Evaluation of Health Care Programmes. (4th edition.). Oxford Press.
2. Tudor Edwards, R. & Mc Intosh, E. (E.d.). (2019). Applied Health Economics for Public Health Practice and Research
3. Gray, A., Clarke, P., Wolstenholme, J., Oxford University Press.Wordsworth, S. (2010). Applied Methods of Cost-Effectiveness Analysis in Health Care.
4. Elliott, R. & Payne, K. (2005). Essentials of Economic Evaluation in Health Care (4th edition). Pharmaceutical Press.

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA4011 MANAGEMENT SKILLS FOR PHARMACISTS (3 CREDITS)

Learning Outcomes

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

- apply the principle of effective management in various settings relevant to the pharmacy profession
- develop the entrepreneurship skills needed for pharmacists
- solve management-related issues in various settings relevant to the pharmacy profession
- demonstrate leadership, teamwork, delegation and motivation skills in various settings relevant to the pharmacy profession.

Course Synopsis

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

Reference Texts

1. Desselle, S. P., Zgarrick, D. P., Alston G. L., & Moczygemba L. R. (2019). Pharmacy Management: Essentials for All Practice Settings, (5th ed). McGraw-Hill Education.
2. Titus De Silva (2013). Essential Management Skills for Pharmacy and Business Managers. Productivity Press.
3. Chisholm-Burns, M.A., Vaillancourt, A.M., & Shepherd, M. (2012). Pharmacy Management, Leadership, Marketing and Finance (2nd ed.). Jones & Bartlett Learning, USA.

Marking and Assessment Methods

Continuous Assessment 50%
Final Examination 50%

OIA4012 CLINICAL CLERKSHIP I (3 CREDITS)

Learning Outcomes

At the end of the course students are able to:

- identify the pharmaceutical care issues from the clerked cases
- develop a pharmaceutical care plan associated with the clerked cases
- perform oral communication professionally

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. Katzung, B. G. (2017). Basic and clinical pharmacology (14th ed). McGraw Hill Education.
2. Ritter, J. M., Flower, R., Henderson. G., Loke Y. K., MacEwan, D. & Rang, H. P. (2019). Rang and Dale's Pharmacology (9th ed). Elsevier Ltd.
3. Whalen, K. (2018). Lippincott's Illustrated Reviews: Pharmacology (7th ed). Wolters Kluwer.
4. Dipiro, J. T., Talbert, R. L., Yee, G.C., Matzke, G. R., Wells, B. G. & Posey, L. M. (2020). Pharmacotherapy: A Pathophysiologic Approach (11th ed). McGraw Hill Education.
5. Herfindal, E. T., Helms, R. A. & Quan, D. J. (2007). Textbooks of Therapeutics. Drug and Disease management (8th ed). Lippincott's Williams and Wilkins.
6. Zeind, C. S. & Carvalho, M. G. (2018). Koda Kimble & Youngs Applied Therapeutics. The Clinical Use of Drugs (11th ed). Wolters Kluwer.
7. British National Formulary (BNF) [latest edition]. British Medical Association.
8. Drug Information Handbook (latest edition). Lexi-Comp Inc.
9. Galt, K.A. (2006). Developing Clinical Practice Skills for Pharmacists. American Society of Health-System Pharmacists Publication.
10. Tietze, K.J. (2012). Clinical Skills for Pharmacists: A Patient-focused Approach. Elsevier/Mosby.

Marking and Assessment Methods

Continuous Assessment 100%

OIA4013 RESEARCH PROJECT II (6 CREDITS)

Learning Outcomes

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

- integrate the principles of research in carrying out data collection
- analyse data correctly.
- compose research findings.
- critique research findings in relation to published literature
- produce a written dissertation according to the requirements.
- perform an oral presentation of the research findings.

Course Synopsis

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

Reference Texts

1. Ecarnot, F., Seronde, M. F., Chopard, R., Schiele, F., & Meneveau, N. (2015). Writing a scientific article: A step-by-step guide for beginners. European Geriatric Medicine, 6(6), 573-579.
2. Creswell, J. W., & Creswell, J. D. (2017). Research design: Qualitative, quantitative, and mixed methods approach. Sage publications.

Marking and Assessment Methods

Continuous Assessment 100%

OIA4014 PHARMACEUTICAL INDUSTRY AND REGULATORY CONTROL (6 CREDITS)

Learning Outcomes

At the end of the course students are able to:

- illustrate the nature and trend of Malaysian pharmaceutical industry
- explain the quality system enforced on pharmaceutical manufacturers, wholesalers and importers
- adapt the quality system enforced on pharmaceutical manufacturers, wholesalers and importers through the existing NPRA website
- guide the organization of pharmacy industry towards compliance of current pharmacy regulatory
- prepare a business proposal appropriate for pharmaceutical industry
- propose a development of an ethical pharmaceutical manufacturing entity in Malaysia

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. Student will do their Industrial training for 6 weeks

Reference Texts

1. Adejare, A. (Ed.). (2020). Remington: The science and practice of pharmacy (23rd ed.). Philadelphia, PA, USA: Academic press.
2. Sale of Drugs Act 1952. Ministry of Health. Malaysia.
3. Rules of Drugs and Cosmetics act 1984. Ministry of Health. Malaysia.
4. Guidelines on Good Manufacturing Practice (GMP) for medicinal products. (2020). Ministry of health, Malaysia: National Pharmaceutical Regulatory Agency.
5. Willig, S. (Ed.). (2000). Good manufacturing practices for pharmaceuticals: a plan for total quality control from manufacturer to consumer (5th ed.). USA: CRC Press.
6. Pharmaceutical Inspection Co-operation Scheme. Good Manufacturing Practice guidelines. (2018). PIC/S Secretariat, Geneva: Pharmaceutical Inspection Convention

Marking and Assessment Methods

Continuous Assessment 100%

OIA4015 CLINICAL CLERKSHIP II (3 CREDITS)

Learning Outcomes

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

- identify the pharmaceutical care issues from the clerked cases
- develop a pharmaceutical care plan associated with the clerked cases
- perform oral communication professionally

Course Synopsis

This module is a continuation of Clinical Clerkship I. The learning for this module is based on ward visits and discussions 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. Katzung, B. G. (2017). Basic and clinical pharmacology (14th ed). McGraw Hill Education.
2. Ritter, J. M., Flower, R., Henderson. G., Loke Y. K., MacEwan, D. & Rang, H. P. (2019). Rang and Dale's Pharmacology (9th ed). Elsevier Ltd.
3. Whalen, K. (2018). Lippincott's Illustrated Reviews: Pharmacology (7th ed). Wolters Kluwer.
4. Dipiro, J. T., Talbert, R. L., Yee, G.C., Matzke, G. R., Wells, B. G. & Posey, L. M. (2020). Pharmacotherapy: A Pathophysiologic Approach (11th ed). McGraw Hill Education.
5. Herfindal, E. T., Helms, R. A. & Quan, D. J. (2007). Textbooks of Therapeutics. Drug and Disease management (8th ed). Lippincott's Williams and Wilkins.
6. Zeind, C. S. & Carvalho, M. G. (2018). Koda Kimble & Youngs Applied Therapeutics. The Clinical Use of Drugs (11th ed). Wolters Kluwer.
7. British National Formulary (BNF) [latest edition]. British Medical Association.
8. Drug Information Handbook (latest edition). Lexi-Comp Inc.
9. Galt, K.A. (2006). Developing Clinical Practice Skills for Pharmacists. American Society of Health-System Pharmacists Publication
10. Tietze, K.J. (2012). Clinical Skills for Pharmacists: A Patient-focused Approach. Elsevier/Mosby

Marking and Assessment Methods

Continuous Assessment 100%

ELECTIVE COURSE

OIA1016 PHARMACOINFORMATICS (2 CREDITS)

Learning Outcomes

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

- recognise the basic principles of web application development including basic php programming, static webpage, dynamic webpage and database
- describe the examples of digital applications for facilitating pharmaceutical practice
- develop a digital management system to facilitate pharmaceutical practice
- perform a digital management system presentation
- develop a digital management system in a group

Course Synopsis

Students will be introduced to the basic principles of web application development including basic php programming, static webpage, dynamic webpage and databases. Besides, examples of digital applications for facilitating pharmaceutical practice will be explored by the students. At the end, the students will develop a web application to facilitate pharmaceutical practice.

Reference Texts

1. Connolly, R. (2015). Fundamentals of web development. Pearson Education.
2. Matthews, M. S. (2015). PHP and MYSQL web development: a beginner's guide/Marty Matthews. New York: McGraw-Hill Education.

Marking and Assessment Methods

Continuous Assessment 100%

OIA1017 NUTRITION AND HEALTH SUPPLEMENT (3 CREDITS)

Learning Outcomes

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

- discuss the regulation of nutrition and health supplements in Malaysia and issues associated with the use of health supplements
- the symptoms of nutritional deficiencies, as well as indication, mechanism of action and side effects of nutrition and health supplements
- Propose appropriate nutrition and health supplements according to patient's condition

Course Synopsis

This module introduces students to the basic knowledge of health supplements, such as vitamins, minerals and herbs. Students will be exposed to the indications, mechanism of action, drug-supplement interactions and side effects of nutrition and health supplements.

Reference Texts

1. Helbing-Sheafe, N. (2007). Nature's Pharmacy: Your personal Guide to Vitamins, Minerals, Trace Elements, Their Food Sources + A Detailed Symptoms, Huckleberry Hill Press.
2. Balch, P.A. (2010). Prescription for Nutritional Healing, Fifth Edition: A Practical A-to-Z Reference to Drug-Free Remedies Using Vitamins. Avery.
3. Gaby, A.R. (2006). A-Z Guide to Drug-Herb-Vitamin Interactions Revised and Expanded: Improve your Health and Avoid Side Effects When Using Common Medications and Natural Supplements Together. Harmony.

Marking and Assessment Methods

Continuous Assessment 100%

OIA1018 TRADITIONAL AND COMPLEMENTARY MEDICINE (3 CREDITS)

Learning Outcomes

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

- describe the principles of traditional and complimentary medicine
- illustrate the difference between traditional and complementary medicine and modern medicine
- explain the regulatory requirements of traditional and complementary medicine products

Course Synopsis

This module describes traditional and complementary medicinal practices by communities worldwide, including modalities and products in various settings within the context of local regulatory requirements.

Reference Texts

1. Micozzi, M. (2015). Fundamental of Complementary and Alternative Medicine (5th ed.). St. Louis, Missouri: Sounders.
2. Evans, W.C. (2009). Trease and Evans Pharmacognosy (16th ed.). Amsterdam: Saunders Elsevier.
3. Pizzorno, J.E., & Murray, M,T. (2012). Text book of natural medicine(4th ed.). St. Louis, Missouri: Churchill Livingstone.
4. Giblet, J.D., & Thomson, H.W. (1971). Dictionary of Malayan Medicine. London: Oxford University press.
5. Zakaria, M., & Mohd, M.A. (2010). Traditional Malay Medicines Plants. Kuala Lumpur : Institut Terjemahan Negara Malaysia.
6. Ahmad, S. (1988). Warisan Perubatan Melayu. Kuala Lumpur: Dewan Bahasa dan Pustaka.
7. Lad, V. (2012). Text book of Ayurveda: The General Principle Management of Treatment (1st ed.). India: The Ayurveda press.
8. Owen, D. (2007). Principles and Practice in Homeopathy (1st ed.). St. Louis, Missouri: Churchill Livingstone.
9. Xiangcai, X. (2001). Principles of Traditional Chinese Medicine, Boston: YMAA Publication Centre.
10. Xinnong, C. (2018). Chinese Acupuncture and Moxibustion (3rd ed.). Beijing: Foreign Languages Press, 2018.
11. Verderame, J. (2018). Straight Chiropractic Text book. North Carolina: Lulu Com, 2018.
12. Traditional Medicine Registration Guidelines and Quality Control. (2019). National Pharmaceutical Regulatory Agency, Ministry of Health Malaysia

Marking and Assessment Methods

Continuous Assessment 100%

OIA1019 PHARMACEUTICAL MICROBIOLOGY (3 CREDITS)

Learning Outcomes

- explain the basics of pharmaceutical microbiology and the important microorganisms involved in pharmaceutical development.
- determine the different secondary metabolites and products of microbial origin which are important in pharmaceutical applications.
- apply good practices and regulation involved in utilizing sterilized microbial product for pharmaceutical application

Course Synopsis

This module provides knowledge and understanding with regards to the significance of the presence of bacteria, yeasts, viruses and toxins in pharmaceutical raw materials, intermediates, products and pharmaceutical production environments, as well as the microbiological control of pharmaceutical products, production environments and people.

Reference Texts

1. Hanlon, G. & Norman, A. (2013). Essential Microbiology for Pharmacy and Pharmaceutical Science, Wiley-Blackwell.
2. Saghee, M.R., Sandle,T. and Tidswell, E.C. (2011). Microbiology and Sterility Assurance in Pharmaceuticals and Medical Devices,Business Horizons.
3. Denyer, S.P., Hodges, N.A., Gorman, S.P. & Gilmore, B.F. (2011). Hugo and Russell's Pharmaceutical Microbiology,Wiley-Blackwell.
4. Mehra, P.S. (2011). A Textbook of Pharmaceutical Microbiology,I K International Publishing House

Marking and Assessment Methods

Continuous Assessment 100%

OIA3033 COSMETIC PRODUCTS (3 CREDITS)

Learning Outcomes

- describe the various types of cosmetic products.
- apply the relevant skills in the manufacturing of cosmetic products.
- illustrate the regulatory procedures required in the manufacturing of cosmetic products.

Course Synopsis

This course provides an overview on different cosmetic preparations available in the market. The functions of cosmetic products and the connection between the product and the organ of the body will also be discussed. The students will also be involved in the understanding of formulation components of these preparations and acquire skills to prepare various cosmetic preparations in lab sessions. The regulatory guidelines that are prerequisite for a cosmetic product and the laws governing these products will also be introduced to the students.

Reference Texts

1. Rosen, M.R. (2015). Harry's Cosmeticology (9th ed.). Vol. 1-3, Palm Springs, CA, USA: Chemical Publishing Company.
2. Taylor, K. & Aulton, M. (Eds). (2018). Aulton's Pharmaceutics: The design and manufacture of medicines (5th ed.), Edinburgh, UK: Elsevier.
3. Martindale: The Complete Drug Reference. (2017). 39th Edition. UK. Pharmaceutical Press.
4. Sheskey, P.J., Cook, W.G. & Cable, C.G. (2017). Hand book of pharmaceutical excipients (8th Ed.). UK. Pharmaceutical Press.
5. Guidelines on Good Manufacturing Practice (GMP) for Cosmetics. (2020). Ministry of health, Malaysia: National Pharmaceutical Regulatory Agency.
6. Edward, S. & Balsam, M. (2008). Cosmetic science and technology (2nd ed.), New Delhi, India: Wiley India Pvt Ltd.
7. Draelos, Z.D. & Thaman, L.A. (2005). Cosmetic formulation of skin care products (1st ed.). Florida, USA: CRC press, Taylor and Francis.
8. Adejare, A. (Ed.). (2020). Remington: The science and practice of pharmacy (23rd ed.). Philadelphia, PA, USA: Academic press.

Marking and Assessment Methods

Continuous Assessment 100%

OIA3034 EMERGING TOPICS IN PHARMACY (3 CREDITS)

Learning Outcomes

- identify emerging topics in pharmacy.
- discuss the relevance of emerging topics in pharmacy including within the local context.
- propose potential implications of emerging topics in pharmacy including within the local context.

Course Synopsis

Students will be exposed to emerging topics in pharmacy and discuss the relevance of identified emerging topics including within the local context and relating to the healthcare system. Students will propose potential wider implications of these emerging topics in pharmacy including within the local context and relating to the healthcare system.

Reference Texts

1. Ministry of Health Malaysia. (2016). Ministry of Health Strategic Plan 2016 – 2020.
2. Ministry of Health Malaysia. (2016). Ministry of Health Action Plan 2016 – 2020.
3. Ministry of Health Malaysia. (2016). National Strategic Plan for Non-Communicable Diseases.
4. Ministry of Health Malaysia. (2016). Ministry of Health Strategic Plan 2016 – 2020.
5. Ministry of Health Malaysia. (2016). Health Facility Planning.
6. Malaysia-WHO. (2017). Country Cooperation Strategy 2016–2020.

Marking and Assessment Methods

Continuous Assessment 100%

GRADING SCHEME

The official University grades including the marks and their meaning are as follows:

Marks	Grade	Grade Point	Meaning
90.00 - 100.00	A+	4.00	High Distinction
80.00 - 89.99	A	4.00	Distinction
75.00 - 79.99	A-	3.70	Distinction
70.00 - 74.99	B+	3.30	Good
65.00 - 69.99	B	3.00	Good
60.00 - 64.99	B-	2.70	Good
55.00 - 59.99	C+	2.30	Pass
50.00 - 54.99	C	2.00	Pass
45.00 - 49.99	C-	1.70	Fail
40.00 - 44.99	D+	1.30	Fail
35.00 – 39.99	D	1.00	Fail
00.00 - 34.99	F	0.00	Fail

In accordance with the Pharmacy Board Malaysia's Standards for Undergraduate Pharmacy Programme 2024, pharmacy students must pass all core pharmacy courses to graduate. The passing mark for a core course must be at least 50%. To pass the core pharmacy courses, students must pass 50% of each component of the continuous and the final exam.

APPEAL AGAINST EXAMINATION RESULTS

1. A student who is not satisfied with his examination results including the continuous assessment component and/or final examination of the course may appeal for a review of his examination results. The appeal shall be made within seven (7) days from the official date of announcement of his examination results.
2. A payment based on the prescribed rate shall be made to process the application for examination results to be reviewed. The payment made is non-refundable regardless whether the appeal is successful or otherwise.
3. The appeal shall be made in a prescribed form by the University. The completed form shall be submitted to the Dean of the Faculty together with a copy of the receipt of the payment for the appeal made.
4. The form for an appeal will not be accepted if it is:
   (a) submitted after the period stipulated in subregulation (1) above;
   (b) incomplete; or
   (c) submitted without the payment receipt.
5. When an appeal is received, the Dean of the Faculty shall appoint a second examiner for the course concerned. The original Examiner and the appointed second Examiner shall review the answer script and/or any assessment component for the said course and report the results of the review to the Faculty Appeals Committee.
6. The Faculty Appeals Committee will decide whether the mark and/or grade of the said student is retained or amended. The original examiner and the second examiner concerned may attend the Faculty Appeals Committee's meeting if needed.
7. The Faculty Appeals Committee shall consider and make recommendations to the Committee of Examiners of any amendments of marks and/or grades of the course for its approval.

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.

UNIVERSITI MALAYA PHARMACY STUDENTS' ACTIVITIES

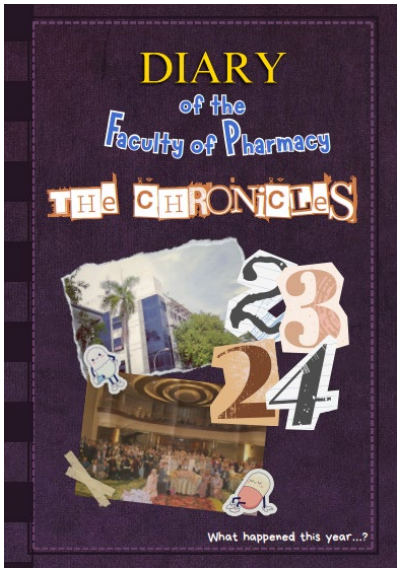
At the Faculty of Pharmacy, UM Pharmacy Society (PharmSoc) is a society for the pharmacy students. This society was established in 1998 as the undergraduates recognised the importance of having a voice to represent pharmacy undergraduates. The purposes for its establishment were:

1. To serve as a platform for undergraduates to be involved in activities beyond daily lecture schedules, and
2. To build a coherent relationship among pharmacy undergraduates from different academic sessions.

The logo and slogan for the society is as shown in Figure above. The society board members include the advisor, president, vice president, secretary, treasurer, public relation officer, project manager, assistant project manager, internal affair officer and web master.

Students are also represented in the Student-Staff Committee, which meets at least two times per year to discuss matters pertaining to academic or non-academic student issues. Activities organised by UM PharmSoc, such as PharmNight, career talks, school visits, community services (such as *Program Sayangi Jantung*) and others to provide opportunities for students to develop linkages with external stakeholders.

UM PharmSoc also publishes yearly Year Book 'The Chronicles'. An example of 2020/2021 The Chronicle Year Book is shown here. 'Social media' theme yearbook was chosen to commemorate full online activities conducted throughout the year. Even though 2020/2021 is a challenging year for all students, there are variety of online activities participated by UM pharmacy students such as Online Public Health Campaign to School Children: 'Antimicrobial Resistance', Virtual Health Village, e-Sports National Pharmacy Sports Carnival, and Online Intervarsity Clinical Skill Events to name a few.



At the University level, the International Student Centre (ISC) provides abundant and comprehensive information on programmes for potential inbound and outbound students, which includes Inbound Long Term Mobility Program, Inbound Short-Term Exchange

Programme, Internship/Research Mobility and Outbound opportunities with various UM Global Partners. The application guidelines for these are available on their website (https://isc.um.edu.my/). At the time being, UM Faculty of Pharmacy conducts only Short-Term Exchange Programme and Outbound activities. At the Faculty level, short-term student exchange involves the Malaysian Pharmacy Students Association (MyPSA) as well as MOU and MOA signed with partner universities. Do look out on announcement made by ISC and also by the Faculty External Linkage Unit!