UNIVERSITI MALAYA

FACULTY OF PHARMACY



BACHELOR OF PHARMACY WITH HONOURS

UNDERGRADUATE HANDBOOK

ACADEMIC SESSION 2026/2027

The Faculty of Pharmacy, Universiti Malaya reserves the right to make any decisions, amendments, or revisions to the information contained in this Handbook as it deems necessary.

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WELCOMING MESSAGE



Welcome to the Faculty of Pharmacy, Universiti Malaya!

Congratulations on being selected to embark on your journey with us, a top 60 university in the QS World University Rankings. You have made an excellent choice in pursuing a career path that offers diverse professional opportunities within the healthcare sector. Pharmacists practice in various fields, including hospital, community, industrial, and regulatory settings. Our four-year program is meticulously designed to shape you into an outstanding pharmacist, fully equipped to provide excellent pharmaceutical care to the nation.

I hope you remain motivated throughout these four years and evolve into an inspiring, world-class pharmacist characterized by the highest integrity, interpersonal skills, and leadership qualities. In this challenging era, academic distinction must be balanced with extracurricular performance to remain competitive, and this pursuit of excellence should continue well into your professional career.

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

Keep your flag flying high and become a valuable asset to society.

Thank you and “Welcome on Board”.

DR. NUSAIBAH ABDUL RAHIM
DEAN

FACULTY MANAGEMENT CHART



DR. NUSAIBAH ABDUL RAHIM
DEAN



ASSOC. PROF. DR. WAN SAFWANI WAN KAMARUL ZAMAN
DEPUTY DEAN
(UNDERGRADUATE & STUDENT AFFAIR)



DR. KAYATRI GOVINDARAJU
DEPUTY DEAN
(POSTGRADUATE, RESEARCH & INNOVATION)



DR. ZARIF MOHAMED SOFIAN
DEPUTY DEAN
(DEVELOPMENT)



MADAM NOOR RAFIZAH YAZIZ
FACULTY MANAGER



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HEAD
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VISION, 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 global health and well-being.

Faculty Objectives

1. To nurture competitive, innovative and highly ethical graduates that effectively contribute to healthcare
2. To foster innovative and cutting-edge research to impact human health
3. To develop outstanding leaders in healthcare that inspire future transformation of the society

Motto

Epitome of Excellence

ACADEMIC CALENDAR 2026/2027 ACADEMIC SESSION (BACHELOR DEGREE LEVEL)

AMENDMENT

SEMESTER I					
Orientation *(Week of Welcome) - WOW*	1	week	26.09.2026	-	04.10.2026
Lectures	8	weeks*	05.10.2026	-	29.11.2026
Mid Semester I Break	1	week	30.11.2026	-	06.12.2026
Lectures	6	weeks*	07.12.2026	-	17.01.2027
Revision Week	1	week*	18.01.2027	-	24.01.2027
Semester I Final Examination	2	weeks*	25.01.2027	-	04.02.2027
Semester I Break	3	weeks*	05.02.2027	-	28.02.2027
	22	weeks			
SEMESTER II					
Lectures	7	weeks*	01.03.2027	-	18.04.2027
Mid Semester II Break	1	week	19.04.2027	-	25.04.2027
Lectures	7	weeks*	26.04.2027	-	13.06.2027
UM iFest 2027	*1*	*week*	*08.06.2027*	-	*11.06.2027*
(No teaching and learning (T&L) activities shall be conducted during this period. Participation is mandatory for all final-year students / students undertaking the Final Year Project (FYP).)					
Revision Week	1	week	14.06.2027	-	20.06.2027
Semester II Final Examination	2	weeks	21.06.2027	-	04.07.2027
Semester II Break	3	weeks	05.07.2027	-	25.07.2027
	21	weeks			
SPECIAL SEMESTER					
Lectures	7	weeks*	19.07.2027	-	05.09.2027
Special Semester Final Examination	1	week	06.09.2027	-	12.09.2027
Special Semester Break	1	week*	13.09.2027	-	19.09.2027
	9	weeks			

Notes:

(1) The Module Registration and Examination Schedule can be referred to at https://umsitsguide.um.edu.my. All information is subject to change.

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

Deepavali	08 November 2026 (Sunday)	*Hybrid Class on 6 November 2026 (Friday)
Christmas Day	25 December 2026 (Friday)	*Hybrid Class on 24 December 2026 (Thursday)
New Year	01 January 2027 (Friday)	
Thaipusam	22 January 2027 (Friday)	
Federal Territory Day	01 February 2027 (Monday)	
Chinese New Year	06 & 07 February 2027 (Saturday & Sunday)	
Nuzul Al-Quran	24 February 2027 (Wednesday)	
Eidul Fitri	10 & 11 March 2027 (Wednesday & Thursday)	*Hybrid Class on 1 - 12 March 2027 (Monday - Friday)

Labour Day	01 May 2027 (Saturday)	
Eidul Adha	17 May 2027 (Monday)	
Wesak Day	20 May 2027 (Thursday)	
Kaamatan Festival	30 May 2027 (Sunday)	*Hybrid Class on 31 May 2027 (Monday)
Gawai Day	01 June 2027 (Tuesday)	*Hybrid Class on 31 May 2027 (Monday)
Awal Muharram	06 June 2027 (Sunday)	
His Majesty the King's Birthday	07 June 2027 (Monday)	
Prophet Muhammad's (Maulidur Rasul)	15 August 2027 (Sunday)	
National Day	31 August 2027 (Tuesday)	
Malaysia Day	16 September 2027 (Thursday)	
(#) Academia Day	05 October 2026 (Monday)	
International Week	19 – 23 October 2026 (Monday - Friday)	
UM iFest 2027	08 – 11 June 2027 (Tuesday - Friday) (No teaching and learning (T&L) activities shall be conducted during this period. Participation is mandatory for all final-year students / students undertaking the Final Year Project (FYP).)	

**Senate July 22, 2026*

PROGRAMME OVERVIEW

TITLE

Title of the conferred degree: Bachelor of Pharmacy with Honours

PHILOSOPHY

The Bachelor of Pharmacy with Honours degree programme that is offered by the Universiti 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.*

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. Pharmacists who deliver quality pharmacy services to promote positive health outcomes while actively functioning as professional healthcare team.
2. Pharmacists who adopt relevant pharmacy practices and apply appropriate digital and information technologies to support effective decision making.
3. Pharmacists who lead collaborative efforts effectively and communicate information professionally to both team members and stakeholders.
4. Pharmacists who adhere to ethical, social, cultural, and professional codes of practice, demonstrate an entrepreneurial mindset and actively engage in life-long learning for continuous personal and professional development.

PROGRAMME LEARNING OUTCOMES (PLO)

PLO1 – Illustrate advanced and comprehensive theoretical and technical knowledge in all areas of pharmacy

PLO2 – Assess pharmaceutical challenges for effective solutions and decisions with critical and analytical skills

PLO3 – Demonstrate pharmaceutical practices including dispensing, formulating and evaluating medicines to meet current and future needs

PLO4 – Collaborate effectively with diverse healthcare teams and professionals, both locally and internationally

PLO5 – Explain pharmaceutical concepts clearly and confidently through effective communication to diverse audiences.

PLO6 – Use a broad range of information, media, and technology to support pharmacy and health related learning and practice

PLO7 – Analyze the relevant quantitative information for effective solutions and decisions for pharmacy practices and education

PLO8 – Integrate leadership and professional skills with autonomy in managing responsibilities and making decisions within diverse pharmacy profession settings.

PLO9 Develop lifelong learning skills across the diverse facets of the pharmacy profession

PLO10 Demonstrate entrepreneurial skills and strategic thinking in developing and managing innovative pharmacy-related projects

PLO11 Adhere to the existing laws of Code of Ethics for Pharmacists and other relevant laws to address and resolve ethical issues in the diverse social and professional context

ACADEMIC PROGRAMME

PROGRAMME STRUCTURE

Category	Courses Code	Course Name	Credit
University Courses	GIG1017 GIG1018	Philosophy and Current Challenges or Malaysian CITRA (for international student)	2
	GIG1019 GLT1049	Malaysian Nation-State Aspiration or Malay Language Communication (for international student)	2
	GIG1016	Integrity and Anti-Corruption Course	2
	GIG1003	Basic Entrepreneurship Enculturation	2
	GUL1001	Embrace@UMLEADER	2
	GUL20xx	Ignite@UMLEADER	2
	GLT	English for Communication or Foreign Language Course*	4
	GKX	Co-Curriculum	2
		Total	**18**
Faculty Core Courses	Programme Core Courses		116
Elective Courses	Programme Elective Courses		6
		Grand Total	**140**

Notes:

*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 more information on university courses, please refer to CITRA website https://citra.um.edu.my/

COURSE STRUCTURE

YEAR 1						
	SEMESTER I, 2026/2027			SEMESTER II, 2026/2027		
Category	**Course Code**	**Course Name**	**Credit**	**Course Code**	**Course Name**	**Credit**
University Courses	GIG1003	Basic Entrepreneurship Enculturation	2	GLT	English for Communication or Foreign Language Course*	2
	GKX	Co-Curriculum	2	GIG1017 GIG1018	Philosophy and Current Challenges or Malaysian CITRA (for international student)	2
	GUL1001	Embrace@UMLEADER	2			
Faculty Core Courses	OIA1004	Anatomy and Physiology	3	OIA1003	Biochemistry	3
	OIA1010	Microbiology and Basic Immunology	3	OIA1021	Fundamentals of Pharmacy	2
	OIA1011	Basic Pharmaceutical Chemistry	2	OIA1022	Chemistry of Drug Discovery and Action	2
	OIA1012	Pharmaceutical Organic Chemistry	2	OIA1023	Physical Pharmaceutics	2
	OIA1020	Principles of Pharmacology	3	OIA1024	Pharmacotherapy for Gastrointesinal Disorders	2
				OIA1025	Pharmacotherapy for Rheumatic and Immune Disorders	2
Programme Elective Courses						
Total			**19**			**17**
	YEAR 1 TOTAL CREDIT: 36					

*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, 2027/2028			SEMESTER II, 2027/2028		
Category	**Course Code**	**Course Name**	**Credit**	**Course Code**	**Course Name**	**Credit**
University Courses	GIG1019 GLT1049	Malaysian Nation-State Aspiration or Malay Language Communication (for international student)	2	GIG1016	Integrity and Anti-Corruption Course	2
	GUL20xx	Ignite@UMLEADER	2			
	GLT	English For Communication Or Foreign Language Course*	2			
Faculty Core Courses	OIA2003	Pharmaceutical Dosage Form Design for Liquids and Semisolids	2	OIA2007	Pharmacognosy	2
	OIA2012	Medicinal Chemistry	3	OIA2011	Pharmacotherapy for Cardiovascular Disorders	3
	OIA2016	Pharmaceutical Analysis I	3	OIA2019	Pharmacotherapy for Infectious Diseases: Fungal and Viral	2
	OIA2018	Extemporaneous Pharmaceutical Preparations	3	OIA2021	Pharmaceutical Analysis II	2
	OIA2020	Pharmacotherapy for Infectious Diseases: Bacterial	3	OIA2022	Solid Dosage Form Design	3
				OIA2023	Sterile Dosage Form Design	3
Programme Elective Courses						
Total			**20**			**17**
	YEAR 2 TOTAL CREDIT: 37					

*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 3						
	SEMESTER I, 2028/2029			SEMESTER II, 2028/2029		
Category	**Course Code**	**Course Name**	**Credit**	**Course Code**	**Course Name**	**Credit**
University Courses						
Faculty Core Courses	OIA3005	Pharmacotherapy for Endocrine Disorders	3	OIA3028	Community Pharmacy Practice	3
	OIA3015	Ethics and Legislation in Pharmacy	2	OIA3029	Hospital Pharmacy Practice	3
	OIA3024	Pharmacoepidemiology and Evidence-Based Pharmacotherapy	2	OIA3032	Research Project I	2
	OIA3025	Pharmaceutical Biotechnology and Personalised Medicine	2	OIA3036	Clinical Pharmacokinetic	3
	OIA3035	Pharmacotherapy For Cancer	2	OIA3037	Advanced Dosage Form Design	3
	OIA3039	Pharmacotherapy For Special Populations	3			
	OIA3043	Pharmacotherapy For Respiratory And Renal Disorders	3			
Programme Elective Courses				OIAxxxx	Elective	3
Total			**17**			**17**
	YEAR 3 TOTAL CREDIT: 34					

YEAR 4						
	SEMESTER I, 2029/2030			SEMESTER II, 2029/2030		
Category	**Course Code**	**Course Name**	**Credit**	**Course Code**	**Course Name**	**Credit**
University Courses	-	-	-	-	-	-
Faculty Core Courses	OIA4002	Pharmacoeconomics	2	OIA4014	Industrial Pharmacy and Regulatory Control	6
	OIA4013	Research Project II	6	OIA4019	Artificial Intelligence In Pharmacy	3
	OIA4016	Drug Discovery And Development	3	OIA4020	Clinical Pharmacy Clerkship II	2
	OIA4017	Pharmacotherapy For Psychiatric & Neurological Disorders	3	OIA4023	Pharmacy Management And Entrepreneurship	2
	OIA4018	Clinical Pharmacy Clerkship I	3			
Programme Elective Courses	-	-	-	OIAxxxx	Elective	3
Total			**17**			**16**
	YEAR 4 TOTAL CREDIT: 33					

SUMMARY OF LANGUAGE UNIVERSITY COURSE PACKAGE
EFFECTIVE FROM INTAKE 2026/2027

Pathway	Stream	Y1S1 (if applicable)	Y1S2	Y2S1	Y2S2 (if applicable)
Path 1 (CEFR B1)	Arts	Placement Test[#] *- for students without recognised English qualifications upon entry*	GLT1050	GLT1052	GLT1053 (APM)
	Science		GLT1051	GLT1052	-
Path 2 (CEFR B2)	Arts		GLT1054	GLT1056	GLT1057 (APM)
	Science		GLT1055	GLT1056	GLT1058 (MBBS)
Path 3 (Foreign Language)	Arts		GLT Foreign Languages	GLT Foreign Languages	GLT Foreign Languages
	Science		GLT Foreign Languages	GLT Foreign Languages	GLT Foreign Languages

[#]Placement Test is required for students who do not possess recognised English qualifications upon admission.

KEY FEATURES

- ➔ Placement Mechanism – Students are placed into Path 1, Path 2, or Path 3 based on recognised English qualifications. A Placement Test will be conducted for students who do not possess recognised English qualifications upon admission.
- ➔ Course Registration – Courses will be packaged into students' course registration in Semester 2 (Y1S2) and Semester 3 (Y2S1) according to the designated pathway and stream-specific entry courses for Arts and Science.
- ➔ Pathway Design – Path 1 and Path 2 are offered as English pathways, while Path 3 focuses on Foreign Language courses to provide students with higher English language proficiency, the opportunity to develop additional global language competencies, and multilingual communication skills.

LANGUAGE UNIVERSITY COURSES (LUC) EFFECTIVE FROM INTAKE 2026/2027

<table>
<tr><td>Semester
Enrolment/ Path</td><td colspan="2">Path 1
Entry: A2/ B1
Exit: High B1/ Low B2</td><td colspan="2">Path 2
Entry: High B1/ Low B2
Exit: High B2/ Low C1</td><td>Path 3 (Foreign Language)
Entry: A1/ A2
Exit: B1</td></tr>
<tr><td>Semester 1
(if applicable)

Placement test#
- for students without recognised English qualifications upon entry</td><td colspan="2">• CEFR A2 and B1
• MUET Band 2, 2.5, 3 & 3.5
• IELTS Band 4.0 – 5.0
• TOEFL Paper-Based Test (437 – 510)
• TOEFL Computer-Based Test (123 – 180)
• TOEFL Internet-Based Test (TBC)
• TOEFL Essentials (Online) (Band 3 – 7.5)
• PTE (Academic) – (10 – 41)
• IGCSE/GCSE (English) (D, E, F, and G)</td><td colspan="2">• CEFR B2
• MUET Band 4 & 4.5
• IELTS Band 5.5 – 6.0
• TOEFL Paper-Based Test (513 – 547)
• TOEFL Computer-Based Test (183 – 210)
• TOEFL Internet-Based Test (TBC)
• TOEFL Essentials (Online) (Band 8 – 9.5)
• PTE (Academic) – (42 – 57)
• GCE A Level (English) (Minimum C)
• IGCSE/GCSE (English) (C)</td><td>• CEFR C1 and C2
• MUET Band 5, 5+ & 6
• IELTS Band 6.5 – 9.0
• TOEFL Paper-Based Test (550 – 677)
• TOEFL Computer-Based Test (213 – 300)
• TOEFL Internet-Based Test (TBC)
• TOEFL Essentials (Online) (Band 10 – 12)
• PTE (Academic) (58 – 90)
• GCE A Level (English) (A and B)
• IGCSE/GCSE (English) (A and B)</td></tr>
<tr><td>Semester 2</td><td><u>Arts Stream</u>
GLT1050 Intermediate Reading and Writing for Social Sciences and Humanities</td><td><u>Science Stream</u>
GLT1051 Intermediate Reading and Writing for Science</td><td><u>Arts Stream</u>
GLT1054 Advanced Reading and Writing for Social Sciences and Humanities</td><td><u>Science Stream</u>
GLT1055 Advanced Reading and Writing for Science</td><td>GLTxxxx Foreign Languages</td></tr>
<tr><td>Semester 3</td><td colspan="2">GLT1052 Intermediate Speaking Skills</td><td colspan="2">GLT1056 Advanced Speaking Skills</td><td>GLTxxxx Foreign Languages</td></tr>
<tr><td>Semester 4
(Programmes with 6-credit LUC)</td><td colspan="2">GLT1053 Intermediate Writing Skills
APM only</td><td><u>Arts Stream</u>
GLT1057 Advanced Writing Skills
APM only</td><td><u>Science Stream</u>
GLT1058 Science Communication for Global Audiences
MBBS only</td><td>GLTxxxx Foreign Languages</td></tr>
</table>

Note: #Placement Test applies where results are unavailable, including for students admitted via Kemasukan Khas (Athlete/SATU) and graduates of the Foundation Programme (China campus)

LIST OF LANGUAGE UNIVERSITY COURSES - FOREIGN LANGUAGES

NO.	COURSE CODE	COURSE NAME	CREDIT
1	GLT1029	Basic Arabic Language 1	2
2	GLT1030	Basic Arabic Language 2	2
3	GLT1031	Basic Japanese Language 1	2
4	GLT1032	Basic Japanese Language 2	2
5	GLT1033	Basic Korean Language 1	2
6	GLT1034	Basic Korean Language 2	2
7	GLT1035	Basic Persian Language	2
8	GLT1036	Basic Portuguese Language 1	2
9	GLT1037	Basic Portuguese Language 2	2
10	GLT1038	Basic Russian Language 1	2
11	GLT1039	Basic Russian Language 2	2
12	GLT1040	Basic Spanish Language 1	2
13	GLT1041	Basic Spanish Language 2	2
14	GLT1042	Basic Thai Language 1	2
15	GLT1043	Basic Thai Language 2	2
16	GLT1044	Basic Turkish Language	2
17	GLT1045	Basic Filipino Language I	2
18	GLT1046	Basic Filipino Language II	2
19	GLT1047	Basic Vietnamese Language I	2
20	GLT1048	Basic Vietnamese Language 2	2

COURSE SUMMARY

CORE COURSES

OIA1003 BIOCHEMISTRY (3 CREDITS)

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

i. 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%

OIA1004 ANATOMY AND PHYSIOLOGY (3 CREDITS)

Learning Outcomes

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

i. describe the overall organization, function and anatomy of the human body (cells, tissues, and organs).
ii. identify anatomical structures of the human body.
iii. illustrate the importance of each of the following systems: endocrine, cardiovascular, lymphatic, digestive, urinary, reproductive, nervous, and respiratory systems.
iv. 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:

i. identify the fundamentals of microbiology encompassing bacteria, viruses, fungi, and parasites, including structures, classification, reproduction, and the basis of antibacterial resistance.
ii. apply the basic concepts of immunology in understanding host defense mechanisms.
iii. describe the pathogenesis of microbial and parasitological infections as well as hypersensitivity mechanisms, including inflammation.

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:

i. apply the principles of the states of matter and concepts associated with gases.
ii. explain the pharmaceutical fundamentals associated with liquids.
iii. state the basics of solids in relation to drugs.
iv. employ the thermodynamics and kinetics theories in pharmaceutical sciences.
v. 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 and its dosage form.

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:

i. describe names, structures, physico-chemical properties and organic reactions of aliphatic hydrocarbons in drugs.
ii. explain structures, physico-chemical properties and organic reactions of functional groups with heteroatom aliphatics in drugs.
iii. discuss structures, physico-chemical properties and organic reactions of aromatic and heterocyclic drugs.
iv. 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%

OIA1020 PRINCIPLES OF PHARMACOLOGY (3 CREDITS)

Learning Outcomes

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

i. apply pharmacokinetic principles (absorption, distribution, metabolism, excretion, and duration of action) to explain drug responses.
ii. explain the mechanisms of drug action and the factors that influence pharmacological effects.
iii. differentiate the actions of cholinergic and adrenergic agonists and antagonists in the autonomic and somatic nervous systems.

Course Synopsis

Students will be introduced to the principles of drug action and the basis for the clinical evaluation of new drugs. This module also includes the transmission of autonomic and somatic nerves.

Reference Texts

1. Katzung B.G. (Ed). (2021). Basic and clinical pharmacology (15th ed.).
2. Appleton & Lange Karen, series editors (Ed.).(2022). Lippincott's Illustrated Reviews : Pharmacology (8th edition)
3. Goodman & Gilman's. (2023). The Pharmacological Basis of Therapeutics (14th ed.).
4. McGraw-Hill Rang, H.P., and Dale, M.M.(2023). Pharmacology (10th ed.).
5. Churchill Livingstone. Page, C. P., & Pitchford, S. (2020). Dale's Pharmacology Condensed (3rd edition).
6. Elsevier. Hitchings, A. W., Lonsdale, D., Burrage, D. & Baker, E. (2022). The Top 100 Drugs: Clinical Pharmacology and Practical Prescribing (3rd edition). Elsevier.

Marking and Assessment Methods

Continuous Assessment 100%

OIA1021 FUNDAMENTALS OF PHARMACY (2 CREDITS)

Learning Outcomes

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

i. explain the roles of pharmacists within the malaysian healthcare system and their importance in pharmacy practice.
ii. describe the pathophysiology, drug mechanisms of action, pharmacokinetic properties, adverse effects, drug interactions, and fundamental management principles of fever and haematologic disorders.
iii. analyse and resolve pharmaceutical care issues related to fever and haematologic disorders using evidence-based approaches.
iv. apply communication and consultation skills to deliver health information and counsel patients effectively.

Course Synopsis

This module introduces the basic principles of pharmacotherapy, pharmaceutical care, posology and the role of pharmacists in the context of Malaysia healthcare system. In this module, 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. (2024). Basic and clinical pharmacology (16th ed). McGraw Hill Education.
2. Ritter, J. M., Flower, R., Henderson, G., Loke, Y. K., MacEwan, D. & Rang, H. P. (2023). Rang and Dale's Pharmacology (10th ed.). Elsevier Ltd
3. Whalen, K. (2022). Lippincott's Illustrated Reviews: Pharmacology (8th ed.). Wolters Kluwer
4. Dipiro, J. T., Talbert, R. L., Yee, G. C., Matzke, G. R., Wells, B. G. & Posey, L. M. (2023). Pharmacotherapy: A Pathophysiologic Approach (12th ed.). McGraw Hill Education
5. Herfindal, E. T., Helms, R. A. & Quan, D. J. (2007). Textbook of Therapeutics: Drug and Disease Management (8th ed.). Lippincott Williams & Wilkins
6. Zeind, C. S. & Carvalho, M. G. (2023). Koda-Kimble & Young's Applied Therapeutics: The Clinical Use of Drugs (12th ed.). Wolters Kluwer British National Formulary (BNF) [latest edition].
7. British Medical Association Drug Information Handbook (latest edition). Lexi-Comp Inc.

Marking and Assessment Methods

Continuous Assessment 100%

OIA1022 CHEMISTRY OF DRUG DISCOVERY AND ACTION (2 CREDITS)

Learning Outcomes

At the end of the course students are able to:

i. explain the fundamental principles and processes of drug discovery and action
ii. illustrate the relationship between drug structure, pharmacophore features, and drug-likeness
iii. identify interactions in protein-ligand complexes using chemico-bioinformatics tools

Course Synopsis

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

Reference Texts

1. Patrick, G.L. (2023) An Introduction to Medicinal Chemistry. 7th ed. Oxford University Press, United Kingdom
2. Silverman, R.B. and Holladay, M.W. (2014) The Organic Chemistry of Drug Design and Drug Action. 3rd ed. Elservier, USA
3. Vanderah, T.W. (2024) Katzung's Basic & Clinical Pharmacology, 16th ed. McGraw-Hill, New York
4. Stromgaard, K., Krogsgaard-Larsen, P. and Madsen, U. (2009) Textbook of Drug Design and Discovery, Fifth Edition. CRC Press, USA

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA1023 PHYSICAL PHARMACEUTICS (2 CREDITS)

Learning Outcomes

At the end of the course students are able to:

i. explain the fundamental physicochemical concepts that govern drug behavior in dosage forms and their impact on bioavailability.
ii. apply physical pharmaceutics principles to predict basic performance and stability of dosage forms and to justify formulation choices.
iii. perform basic experiments in rheology, micromeritics, dissolution to support the development of pharmaceutical dosage forms.

Course Synopsis

The course introduces to the students the principles of physical pharmaceutics required in the formulations of pharmaceutical dosage forms. Physicochemical properties of the pharmaceutical materials together with the methods to determine their properties are also included. The students will also perform laboratory works related topics given in the theory.

Reference Texts

1. Sinko, P. J. (2023). Martin's physical pharmacy and pharmaceutical sciences. Philadelphia: Walters Kluwer Health.
2. Attwood, D., & Florence, A.T. (2020). Physical pharmacy. London: Pharmaceutical Press.
3. Sarkar, A. B. (2024). Contemporary Physical Pharmacy and Pharmaceutics. Linus Learning.

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA1024 PHARMACOTHERAPY FOR GASTROINTESINAL DISORDERS (2 CREDITS)

Learning Outcomes

At the end of the course students are able to:

i. describe the pathophysiology and management of gastrointestinal disorders.
ii. explain the mechanisms of action, pharmacokinetic properties, adverse effects and drug interactions of drugs used in gastrointestinal disorders.
iii. solve pharmaceutical care issues for gastrointestinal 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 gastrointestinal drugs and clinical management of gastrointestinal will be covered. Students will be introduced to the concept of management of various gastrointestinal such as peptic ulcer disease and hepatic disorders.

Reference Texts

1. British National Formulary (BNF) [latest edition]. British Medical Association.
2. Drug Information Handbook (latest edition). Lexi-Comp Inc.
3. Katzung, B. G. (2017). Basic and Clinical Pharmacology (14th ed.). McGraw Hill Education.
4. 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.
5. Whalen, K. (2018). Lippincott's Illustrated Reviews: Pharmacology (7th ed.). Wolters Kluwer.
6. 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.
7. Herfindal, E. T., Helms, R. A., & Quan, D. J. (2007). Textbooks of Therapeutics: Drug and Disease Management (8th ed.). Lippincott's Williams and Wilkins.
8. Zeind, C. S. & Carvalho, M. G. (2018). Koda Kimble & Youngs Applied Therapeutics: The Clinical Use of Drugs (11th ed.). Wolters Kluwer.

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA1025 PHARMACOTHERAPY FOR RHEUMATIC AND IMMUNE DISORDERS (2 CREDITS)

Learning Outcomes

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

i. describe the pathophysiology and pharmacology of drugs used in rheumatic and immune disorders.
ii. recommend appropriate interventions to solve the pharmaceutical care issues for rheumatic and immune disorders.
iii. demonstrate professionalism and the rationale of pharmacology of drugs used in rheumatic and immune 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 rheumatic and immune disorders will be discussed.

Reference Texts

1. Vanderah, T. W. (2024). Katzung's Basic & Clinical Pharmacology (16th ed.). McGraw Hill Education
2. Ritter, J. M., Flower, R., Henderson. G., Loke Y. K., MacEwan D., Robinson, E., Fullerton, J. (2023). Rang and Dale's Pharmacology (10th ed). Elsevier Ltd.
3. Whalen, K. (2022). Lippincott's Illustrated Reviews: Pharmacology (8th ed). Wolters Kluwer.
4. DiPiro, J. T., Yee, G.C., Haines, S. T., Nolin, T. D., Ellingrod, V. L., Michael Posey, L. (2023). DiPiro's Pharmacotherapy: A Pathophysiologic Approach (12th ed). McGraw Hill Education.
5. Zeind, C. S., Carvalho, M. G., Cheng, J. W., Zaiken, K., & LaPointe, T. (2023). Applied therapeutics: the clinical use of drugs. Wolters Kulwer.

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA2003 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. Florence, A.T, & Attwod, D. (2015). Physicochemical Principles of Pharmacy (6th ed.). London: Pharmaceutical Press.
2. Sinko, P.J. (Eds.). (2016). Martin's Physical Pharmacy and Pharmaceutical Sciences (7th ed.). Baltimore: Lippincott Williams and Wilkins.
3. Taylor, K., & Aulton, M. (Eds.). (2018). Aulton's Pharmaceutic: The Design and Manufacture of Medicines (5th ed.). London: Elsevier Health Sciences.
4. Adejare, A. (Eds). (2020). Remington's The Science and Practice of Pharmacy (23rd ed.). USA: academic Press.
5. Guideline for Application for Registration of Pharmaceutical Product (2019). National Pharmaceutical Regulatory Agency, Ministry of Health Malaysia.
6. Pharmaceutical Inspection Co-operation Scheme. Good Manufacturing Practice guidelines. (2018). PIC/S Secretariat, Geneva: Pharmaceutical Inspection Convention. British Pharmacopoeia (2020 ed.). UK:
7. British Pharmacopoeia Commision United States Pharmacopoeia 42-NF 37. (2019). Rockville, USA. United States Pharmaceutical Commission.

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:

i. discuss the factors influencing medicinal plants and its cultivation, harvesting, storage and deterioration.
ii. recognise the phytochemicals and related metabolic pathway with suitable examples.
iii. differentiate the methods of herbal medicine evaluation and standardization.
iv. demonstrate the methods of herbal drug evaluation and standardisation.

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%

OIA2011 PHARMACOTHERAPY FOR CARDIOVASCULAR DISORDERS (3 CREDITS)

Learning Outcomes

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

i. describe the pathophysiology and management of cardiovascular and cerebrovascular disorders
ii. explain the mechanisms of action, pharmacokinetic properties, adverse effects and drug interactions of drugs used in cardiovascular and cerebrovascular disorders
iii. interpret laboratory test results with the principles of patient management
iv. 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. This course provides an in-depth exploration of the principles and clinical application of pharmacotherapy in the management of major cardiovascular disorders. Students will develop a strong understanding of cardiovascular pathophysiology and the pharmacological basis of treatment, with emphasis on evidence-based guidelines and patient-centred care. Topics covered include pharmacotherapy for hypertension, ischemic heart disease, heart failure, arrhythmias, dyslipidaemia, thromboembolic disorders, and other common cardiovascular conditions. Students will learn to evaluate drug therapy options, individualise treatment plans, interpret clinical data, and apply guideline-directed recommendations to optimise therapeutic outcomes. Through interactive lectures, case-based discussions, and problem-solving activities, students will refine their clinical reasoning and decision-making skills. The course aims to prepare learners to identify, prevent, and resolve drug-related problems in cardiovascular care, ensuring safe and effective use of medications. By the end of the course, students will be able to integrate pharmacological knowledge with patient-specific considerations to deliver comprehensive pharmacotherapy management for cardiovascular disorders.

Reference Texts

1. Vanderah, T. W. (2024). Katzung's Basic & Clinical Pharmacology (16th ed.). McGraw Hill Education
2. Ritter, J. M., Flower, R., Henderson. G., Loke Y. K., MacEwan, D. & Rang, H. P. (2024). Rang and Dale's Pharmacology (10th ed). Elsevier Ltd.
3. Whalen, K. (2023). Lippincott's Illustrated Reviews: Pharmacology (8th ed). Wolters Kluwer.
4. Dipiro, J. T., Talbert, R. L., Yee, G.C., Matzke, G. R., Wells, B. G. & Posey, L. M. (2023). Pharmacotherapy: A Pathophysiologic Approach (12th ed). McGraw Hill Education.
5. Zeind, C. S., Carvalho, M. G., Cheng, J. W., Zaiken, K., & LaPointe, T. (2023). Applied therapeutics: the clinical use of drugs. Wolters Kulwer
6. British National Formulary (BNF) [latest edition]. British Medical Association.
7. Drug Information Handbook (latest edition). Lexi-Comp Inc.

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:

i. describe the development of important drugs in the major drug classes and their structure-activity relationships using databases/any digital software
ii. analyse the structure-activity relationships of the major drug classes.
iii. build digital models of drug analogues based on their chemical structures with potential biological activities

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%

OIA2016 PHARMACEUTICAL ANALYSIS I (3 CREDITS)

Learning Outcomes

At the end of the course students are able to:

i. apply the principles of analytical tools using refractometry, polarimetry, and spectrophotometric methods based on pharmacopoeia
ii. employ the principles of nmr and ms methods as analytical tools in structural determination.
iii. perform major analytical methods in structural determination and quality control

Course Synopsis

The course introduces the principles and analytical technique 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%

OIA2018 EXTEMPORANEOUS PHARMACEUTICAL PREPARATIONS (3 CREDITS)

Learning Outcomes

At the end of the course students are able to:

i. demonstrate the ability to interpret prescriptions
ii. perform calculations to prepare extemporaneous preparation
iii. demonstrate the compounding of extemporaneous preparations in accordance with standards from BNF and BPC
iv. 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 labeling of extemporaneous preparations are also included.

Reference Texts

1. Taylor, K. & Aulton, M. (Eds). (2021). Aulton's Pharmaceutics: The design and manufacture of medicines (6th ed.), Edinburgh, UK: Elsevier.
2. British National Formulary 89. (2025). London. The Pharmaceutical Press.
3. Martindale: The Complete Drug Reference. (2024). 41st Edition. UK. Pharmaceutical Press.
4. Allen, L.V., Popovich, N.G. & Ansel, H.C. (2021). Ansel's pharmaceutical dosage forms and drug delivery systems (12th ed.). Philadelphia, USA. Wolters Kluwer Health.
5. British Pharmaceutical Codex. (2023). Pharmaceutical Society of Great Britain. Facimile Publisher
6. Carter, S.J. (2018). Cooper & Gunn's Dispensing for pharmaceutical students (12th ed. Kindle edition). New Delhi, India: CBS Publishers and Distributers
7. Adejare, A. (Ed.). (2020). Remington: The science and practice of pharmacy (23rd ed.). Philadelphia, PA, USA: Academic press Stockton, S.J. & Ansel, H.C. (2021). Pharmaceutical Calculations (16 th ed. North American). Philadelphia, USA: Lippincott, William & Wilkins

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA2019 PHARMACOTHERAPY FOR INFECTIOUS DISEASES: FUNGAL AND VIRAL (2 CREDITS)

Learning Outcomes

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

i. describe the pathophysiology and management of fungal and viral infections.
ii. explain the mechanisms of action, pharmacokinetic properties, adverse effects and drug interactions of drugs used in fungal and viral infections.
iii. develop the pharmaceutical care plan for the various fungal and viral infection disorders

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 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).
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).
5. Pharmacotherapy: A Pathophysiologic Approach (11th ed). McGraw Hill Education.
6. British National Formulary (BNF) [latest edition]. British Medical Association.
7. Drug Information Handbook (latest edition). Lexi-Comp Inc.
8. Rang and Dale’s Pharmacology (9th ed). Elsevier Ltd.

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA2020 PHARMACOTHERAPY FOR INFECTIOUS DISEASES: BACTERIAL (3 CREDITS)

Learning Outcomes

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

i. describe the pathophysiology and management of bacterial infections.
ii. explain the mechanisms of action, pharmacokinetic properties, adverse effects and drug interactions of drugs used in bacterial infections.
iii. develop the pharmaceutical care plan for the various bacterial infection disorders

Course Synopsis

This module is one of the module series that integrates the pharmacology discipline with clinical pharmacy. In this module, 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 system, 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).
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).
5. Pharmacotherapy: A Pathophysiologic Approach (11th ed). McGraw Hill Education.
6. British National Formulary (BNF) [latest edition]. British Medical Association.
7. Drug Information Handbook (latest edition). Lexi-Comp Inc.
8. Rang and Dale's Pharmacology (9th ed). Elsevier Ltd.

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA2021 PHARMACEUTICAL ANALYSIS II (2 CREDIT)

Learning Outcomes

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

i. apply the concepts of radiochemistry to pharmacy.
ii. explain the use of electrochemistry concepts in pharmaceutical analysis.
iii. apply the principles of chromatography in pharmaceutical analysis. clo
iv. perform chromatographic analysis.

Course Synopsis

As a continuation of Pharmaceutical Analysis I, this course introduces further analytical principles and techniques that are used in drug quality control, dosage form design, 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.
7. (E-Book) Liquid chromatography. Volume 1, Fundamentals and instrumentation. Contributors: Salvatore Fanali, Bezhan Chankvetadze, Paul R. Haddad,
8. Colin Poole, and Marja-Liisa Riekkola. Published: Elsevier, Amsterdam, 2023 Edition: Third edition / edited by Salvatore Fanali, Bezhan Chankvetadze,
9. Paul R. Haddad, Colin Poole, Marja-Liisa Riekkola.
10. Yuliy D. Gamburg. The fundamentals of electrochemistry. Published: Cambridge Scholars Publishing, Newcastle upon Tyne, UK, 2023

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA2022 SOLID DOSAGE FORM DESIGN (3 CREDIT)

Learning Outcomes

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

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

Course Synopsis

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

Reference Texts

1. United States Pharmacopoeia 42-NF 37. (2019). Rockville, USA. United States Pharmaceutical commission.
2. 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.
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. Taylor, K. & Aulton, M. (Eds). (2018). Aulton's Pharmaceutics: The design and manufacture of medicines (5th ed.), Edinburgh, UK: Elsevier.
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.
8. Wolters Kluwer Health.
9. British Pharmacopoeia. (2024), UK.
10. British pharmaceutical commission. Indian Pharmacopoeia. (2022) ,IPC

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA2023 STERILE DOSAGE FORM DESIGN (3 CREDIT)

Learning Outcomes

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

i. relate the concept, types, manufacturing process and formulation of sterile pharmaceutical dosage forms
ii. assemble sterile pharmaceutical dosage forms extemporaneously using aseptic technique
iii. perform compendial and non-compendial quality control (QC) tests for sterile pharmaceutical dosage forms

Course Synopsis

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

Reference Texts

1. Taylor, K. & Aulton, M. (Eds). (2021). Aulton's Pharmaceutics: The design and manufacture of medicines (6th ed.), Edinburgh, UK: Elsevier.
2. Allen, L.V., Popovich, N.G. & Ansel, H.C. (2021). Ansel's pharmaceutical dosage forms and drug delivery systems (12th ed.). Philadelphia, USA. Wolters Kluwer Health.
3. British Pharmacopoeia. (2024), UK. British pharmaceutical commission United States Pharmacopoeia. (2024). Rockville, USA.
4. United States Pharmaceutical commission Khar, R.K. & Vyas, S.P. (2018). Lachman/Lieberman's The theory and practice of industrial pharmacy (4th ed.). New Delhi, India. CBS Publishers and Distributers
5. Martindale: The Complete Drug Reference. (2020). 40th Edition. UK. Pharmaceutical Press
6. Sheskey, P.J., Cook, W.G. & Cable, C.G. (2020). Handbook of pharmaceutical excipients (9th ed. Revised). UK. Pharmaceutical Press
7. Pharmaceutical Inspection Co-operation Scheme. Good Manufacturing Practice guidelines. (2024). PIC/S Secretariat, Geneva: Pharmaceutical Inspection Convention
8. Stockton, S.J. & Ansel, H.C. (2021). Pharmaceutical Calculations (16 th ed. North American). Philadelphia, USA: Lippincott, William & Wilkins

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA3005 PHARMACOTHERAPY FOR ENDOCRINE DISORDERS (3 CREDIT)

Learning Outcomes

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

i. describe the pathophysiology and management of endocrine and metabolic disorders.
ii. perform experiment to analyse homeostatic response by the endocrine system.
iii. explain the mechanisms of action, pharmacokinetic properties, adverse effects and drug interactions of drugs used in endocrine and metabolic disorders.
iv. interpret laboratory test results based on the principles of patient management.
v. solve pharmaceutical care issues that are relevant to 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. G. (2024). Basic and clinical pharmacology (16th 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. (2022). Lippincott's Illustrated Reviews: Pharmacology (8th ed). Wolters Kluwer.
4. Dipiro, J. T., Talbert, R. L., Yee, G.C., Matzke, G. R., Wells, B. G. & Posey, L. M. (2023). Pharmacotherapy: A Pathophysiologic Approach (12th 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. (2023). Koda Kimble & Youngs Applied Therapeutics. The Clinical Use of Drugs (12th ed). Wolters Kluwer. British National Formulary (BNF) [latest edition]. British Medical Association.
7. Drug Information Handbook (latest edition). Lexi-Comp Inc.

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:

i. apply the various pharmacy legislation on business of pharmacy.
ii. apply the requirement of regulatory authority on different pharmaceutical product in Malaysia.
iii. perform enforcement and court presentation on pharmacy cases related with Malaysian pharmacy legislation.
iv. propose advice to other professional and the general public on legislation of drug and pharmaceutical in Malaysia
v. 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%

OIA3024 PHARMACOEPIDEMIOLOGY AND EVIDENCE-BASED PHARMACOTHERAPY (2 CREDITS)

Learning Outcomes

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

i. interpret the statistical test results in research
ii. apply the knowledge of pharmacoepidemiology in relation to pharmacy and public health
iii. 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:

i. describe the basics and procedures of recombinant DNA technology
ii. describe the production, purification, quality control and formulation of therapeutic protein
iii. apply pharmacogenomics concept and techniques in therapeutics and clinical setting
iv. 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%

OIA3028 COMMUNITY PHARMACY PRACTICE (3 CREDITS)

Learning Outcomes

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

i. solve common health problems presented at community pharmacies
ii. design health promotional material for the public
iii. interpret screening tests commonly carried out by the community pharmacies
iv. 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:

i. explain the various roles of a hospital pharmacist and the various services provided in a hospital pharmacy
ii. perform effective prescription screening and intervention, labelling/ worksheet preparation, filing/ reconstitution, counter checking process and dispensing of medicines
iii. perform effective oral and written communication professionally
iv. 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%

OIA3032 RESEARCH PROJECT I (2 CREDITS)

Learning Outcomes

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

i. critique scientific literature to identify knowledge gaps and research opportunities.
ii. organize relevant scientific information using digital tools and online resources to support research planning.
iii. demonstrate initiative and accountability in managing research progress and decisions throughout the project.
iv. present research proposals clearly and confidently
v. apply ethical and professional practices in sourcing, reviewing, and presenting scientific literature in a research proposal.

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. David Lindsay. (2020). Scientific writing = thinking in words. 2nd edition. CSIRO Publishing.
2. Creswell, J. W., & Creswell, J. D. (2023). Research design: Qualitative, quantitative, and mixed methods approaches. 6th edition. Sage publications

Marking and Assessment Methods

Continuous Assessment 100%

OIA3035 PHARMACOTHERAPY FOR CANCER (2 CREDITS)

Learning Outcomes

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

i. describe the pathophysiology and management of cancer.
ii. explain the mechanisms of action, pharmacokinetic properties, adverse effects and drug interactions of drugs used in the management of cancer.
iii. interpret laboratory test results based on the principles of cancer patient management.
iv. design pharmaceutical care plans that are relevant to this disorder.

Course Synopsis

This course is one of a series of modules that integrate the disciplines of pharmacology and clinical pharmacy. In this module, the pharmacology of drugs used for the clinical management of cancer and pain will be taught. Students will be introduced to the concepts of clinical management for various cancers, including solid and non-solid tumours, as well as pain disorders.

Reference Texts

1. Katzung B.G: Basic and clinical pharmacology (16th ed.) 2024.
2. Lippincott's Illustrated Reviews : Pharmacology (8th ed.) 2022.
3. Goodman & Gilman's: The Pharmacological Basis of Therapeutics (14th ed.) 2023
4. Dipiro, J. T. Pharmacotherapy: A Pathophysiologic Approach (11th ed). McGraw Hill Education, 2020
5. Rang & Dale's Pharmacology, International Edition (10th ed.) 2024
6. Constance G. Visovsky: Introduction to Clinical Pharmacology (11th ed.) 2025. British National Formulary (BNF) [latest edition]. British Medical Association.
7. Derek G. Waller: Medical Pharmacology and Therapeutics E-Book (5th ed) 2017.
8. Jennifer Hofmann: Mind Maps in Medical Pharmacology (1st ed.) 2024.
9. Sharma H.L. and Sharma K.K: Principles of pharmacology (3rd ed.) 2017.
10. Tripathi K.D: Essentials of Medical Pharmacology (8th ed.) 2023.

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA3036 CLINICAL PHARMACOKINETIC (3 CREDITS)

Learning Outcomes

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

i. explain the different approaches in pharmacokinetic analyses.
ii. interpret the dosing regimen and time course of drug concentration data in relation to pharmacokinetic parameters.
iii. perform calculation for patient-specific dosing regimen based on derived pharmacokinetic parameters
iv. 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%

OIA3037 ADVANCED DOSAGE FORM DESIGN (3 CREDITS)

Learning Outcomes

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

i. identify advanced dosage forms which are new in the market and those in research stage.
ii. illustrate the potential of local materials that can be use explored for use in advanced dosage forms.
iii. formulate slow release or sustained release or targeted release dosage forms and/or those suitable for macromolecular delivery.
iv. advise on the types and usage of advanced dosage forms to other medical professional and the public.

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. Adejare, A. (Ed.). (2020). Remington: The science and practice of pharmacy (23rd ed.). Philadelphia, PA, USA: Academic press.
2. British Pharmacopoeia. (2024), UK. British pharmaceutical commission.
3. Zhang, Y., & Jin, Z. (2024). Novel Drug Delivery Systems: Design, Evaluation and Application (p. 220). MDPI-Multidisciplinary Digital Publishing Institute.
4. Yadav, A. K., & Jain, K. (Eds.). (2024). Novel carrier systems for targeted and controlled drug delivery. Springer.
5. Bera, H., Hossain, C. M., & Saha, S. (Eds.). (2021). Biopolymer-Based Nanomaterials in Drug Delivery and Biomedical Applications. Academic Press.

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA3039 PHARMACOTHERAPY FOR SPECIAL POPULATIONS (3 CREDITS)

Learning Outcomes

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

i. discuss the pathophysiology and management of disorders affecting special population
ii. explain the mechanisms of action, pharmacokinetic properties, adverse effects and drug interactions of drugs used for disorders affecting special population.
iii. interpret laboratory test results with the principles of patient management involving disorders affecting special population.
iv. develop solutions for pharmaceutical care issues involving disorders affecting special 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, pediatric, 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. (2024). Katzung's Basic and Clinical Pharmacology (16th ed). McGraw Hill Education.
2. Ritter, J. M., Flower, R., Henderson. G., Loke Y. K., MacEwan, D. & Rang, H. P. (2023). Rang and Dale's Pharmacology (10th ed). Elsevier Ltd.
3. Whalen, K. (2023). Lippincott's Illustrated Reviews: Pharmacology (8th ed). Wolters Kluwer.
4. Caroline S Zeind PharmD (Author), Michael G Carvalho, Judy W.M. Cheng, Kathy Zaiken, Trisha LaPointe (2023). Applied Therapeutics: The Clinical Use of Drugs (Koda Kimble and Youngs Applied Therapeutics) (12th Ed). LWW
5. British National Formulary (BNF) [latest edition]. British Medical Association.
6. Drug Information Handbook (latest edition). Lexi-Comp Inc

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA3043 PHARMACOTHERAPY FOR RESPIRATORY AND RENAL DISORDERS (3 CREDITS)

Learning Outcomes

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

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

Course Synopsis

This course provides an in-depth understanding of the pathophysiology, clinical presentation, and evidence-based pharmacotherapy of major respiratory and renal disorders. Students will learn to evaluate patient information, identify drug-related problems, and formulate patient-centred therapeutic plans. Emphasis is placed on applying clinical guidelines, optimising medication use, monitoring treatment outcomes, and integrating non-pharmacological strategies in respiratory and renal care.

Reference Texts

1. Vanderah, T. W. (2024). Katzung's Basic & Clinical Pharmacology (16th ed.). McGraw Hill Education
2. Ritter, J. M., Flower, R., Henderson. G., Loke Y. K., MacEwan D., Robinson, E., Fullerton, J. (2023). Rang and Dale's Pharmacology (10th ed). Elsevier Ltd
3. Whalen, K. (2022). Lippincott's Illustrated Reviews: Pharmacology (8th ed). Wolters Kluwer DiPiro, J. T., Yee, G.C., Haines, S. T., Nolin, T. D., Ellingrod, V. L., Michael Posey, L. (2023).
4. DiPiro's Pharmacotherapy: A Pathophysiologic Approach (12th ed). McGraw Hill Education
5. Zeind, C. S., Carvalho, M. G., Cheng, J. W., Zaiken, K., & LaPointe, T. (2023). Applied therapeutics: the clinical use of drugs. Wolters Kulwer.
6. British National Formulary (BNF) [latest edition]. British Medical Association
7. Drug Information Handbook [latest edition]. Lexi-Comp Inc

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:

i. explain various methods of economic evaluations of evidence-based healthcare interventions.
ii. determine various types of costs that relate to different perspectives used in economic evaluations of evidence-based healthcare interventions.
iii. 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%

OIA4013 RESEARCH PROJECT II (6 CREDITS)

Learning Outcomes

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

i. assemble and conduct research procedures to gather data.
ii. analyse the data systematically.
iii. demonstrate the ability to adapt and improve research skills through ongoing learning.
iv. prepare a research dissertation using digital tools to organize, analyze, and present data.
v. 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. David Lindsay. (2020). Scientific writing = thinking in words. 2nd edition. CSIRO Publishing.
2. Creswell, J. W., & Creswell, J. D. (2023). Research design: Qualitative, quantitative, and mixed methods approaches. 6th edition. 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:

i. illustrate the nature and trend of Malaysian pharmaceutical industry.
ii. explain the quality system enforced on pharmaceutical manufacturers, wholesalers and importers.
iii. adapt the quality system enforced on pharmaceutical manufacturers, wholesalers and importers through the existing NPRA website.
iv. develop lifelong learning skills to gain exposure to the pharmacy industry, encompassing regulatory affairs and varied professional sectors

Course Synopsis

Students will be introduced to the overall concept of Quality Assurance, the need for Quality Assurance in Pharmaceutical Industries and its applications. Students 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, regulations and Good Distribution Practices. International standards of quality and their relevance to Quality Assurance will be explained. Student will do their Industrial training for 4 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%

OIA4016 DRUG DISCOVERY AND DEVELOPMENT (3 CREDITS)

Learning Outcomes

At the end of the course students are able to:

i. describe the process and recent challenges of drug discovery and development.
ii. demonstrate a basic knowledge on the use of computational tools as one of the methods for drug discovery.
iii. explain laboratory experiment related to drug discovery and development
iv. 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, intelectual property and commercial considerations.

Reference Texts

1. Ritter, J. M., Flower, R. J., Henderson, G., Loke, Y. K., MacEwan, D., & Robinson, E. (2023). Rang & Dale's Pharmacology (10th ed.). Elsevier.
2. Brunton, L. L., & Knollmann, B. C. (2022). Goodman & Gilman's The Pharmacological Basis of Therapeutics (14th ed.). McGraw-Hill Education.
3. Allen, L. V. (2021). Ansel’s Pharmaceutical Dosage Forms and Drug Delivery Systems (11th ed.). Lippincott Williams & Wilkins.
4. Sinko, P. J. (2023). Martin’s Physical Pharmacy and Pharmaceutical Sciences (8th ed.). Walters Kluwer Health.
5. International Council for Harmonisation (ICH) guideline.

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA4017 PHARMACOTHERAPY FOR PSYCHIATRIC & NEUROLOGICAL DISORDERS (3 CREDITS)

Learning Outcomes

At the end of the course students are able to:

i. describe the pathophysiology and management for psychiatric and neurological disorders.
ii. explain the mechanisms of action, pharmacokinetic properties, adverse effects and drug interactions of drugs used in psychiatric and neurological disorders.
iii. 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, 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, dan 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 (BNF) (84th Edition). British Medical Association. (2022)
8. Adult Drug Information Handbook: A Clinically Relevant Resource for All Healthcare Professionals (33rd Edition). Lexi-Comp Inc. (2024)

Marking and Assessment Methods

Continuous Assessment 40%
Final Examination 60%

OIA4018 CLINICAL PHARMACY CLERKSHIP I (3 CREDITS)

Learning Outcomes

At the end of the course students are able to:

i. identify the pharmaceutical care issues from the clerked cases
ii. develop a pharmaceutical care plan based on the clerked cases.
iii. perform oral communication professionally
iv. develop self-management skills during clerkship activities, reflecting accountability, adaptability, and ethical responsibility in a healthcare setting

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. Vanderah, T. W. (2023) Katzung's Basic & Clinical Pharmacology (16th ed.) McGraw Hill. (e-Book)
2. Brunton, L. & Knollman, B. (2022) Goodman and Gilman's The Pharmacological Basis of Therapeutics, 14th ed. McGraw Hill. (e-Book)
3. Ritter, J. M., Flower, R. J., Henderson, G. etc. (2023). Rang and Dale Pharmacology (10th ed.). Elsevier (e-Book)
4. Dipiro, J.T., Yee, G.C., & Haines, S.T. (2023). Pharmacotherapy: A Pathophysiologic Approach (12th ed.). McGraw-Hill. (e-Book)
5. Zeind, C. S., Carvalho, M. G., Cheng, J. W. M., etc. (2023) Applied Therapeutics: The Clinical Use of Drugs (Koda Kimble and Youngs Applied Therapeutics) Lippincott Williams and Wilkins. (e-Book)
6. Galt KA. (2006) Developing clinical practice skills for pharmacists. American Society of Health-System Pharmacists Publication.
7. Tietze KJ. (2012) Clinical skills for pharmacists: A patient-focused approach. St. Louis: Elsevier/Mosby.
8. Whittlesea, C. & Hodson, K. (2019). Clinical Pharmacy and Therapeutics. (6th ed.) Elsevier.
9. British National Formulary; 2025 or later edition.
10. Adult Drug Information Handbook. Lexi-Comp's Clinical Reference Library (2021) (30th Edition). American Pharmacists Association.
11. Up To Date
12. MIMS Drug Reference - Recent version
13. Various clinical practice guidelines

Marking and Assessment Methods

Continuous Assessment 100%

OIA4019 ARTIFICIAL INTELLIGENCE IN PHARMACY (3 CREDITS)

Learning Outcomes

At the end of the course students are able to:

i. explain the fundamental concepts and significance of artificial intelligence (AI) in healthcare, including its potential impact on patient care and system efficiency
ii. assess basic and advanced AI techniques, including machine learning and deep learning to analyse healthcare data and address challenges in diagnostics, treatment, and public health
iii. evaluate ethical considerations and data privacy challenges in deploying AI solutions in healthcare, including patient confidentiality, bias, and regulatory compliance

Course Synopsis

This course offers exploration on how AI is being used to turn the healthcare and namely pharmacy industry into a highly data-driven field. In addition, this course will show you on how different technologies are revolutionising in healthcare such as diagnostics, personalised medicine, pharmacy and robotics. With a strong focus on ethical issues, you'll be able to dissect and discuss the complex challenges faced in modern healthcare settings. This course also offers you an understanding on AI driven medical and pharmacy solutions and how machine-learning techniques can help solve real-world problems.

Reference Texts

1. Suen S, Scheinker D, Enns E, eds. Artificial Intelligence for Healthcare: Interdisciplinary Partnerships for Analytics-Driven Improvements in a Post COVID World. Cambridge University Press; 2022
2. Srinivasa, K. Artificial Intelligence for Information Management: A Healthcare Perspective. Springer, 2021
3. Bhupathyraaj M, Vijaya Rani KR, Essa MM, editors. Artificial intelligence in pharmaceutical sciences. London: Routledge; 2024
4. Patil, Sarika. Artificial Intelligence in Pharmacy: Applications, Challenges, and Future Directions in Drug Discovery, Development, and Healthcare. Deep Science Publishing, 2025

Marking and Assessment Methods

Continuous Assessment 100%

OIA4020 CLINICAL PHARMACY CLERKSHIP II (2 CREDITS)

Learning Outcomes

At the end of the course students are able to:

i. identify the pharmaceutical care issues from the clerked cases
ii. develop a pharmaceutical care plan based on the clerked cases.
iii. perform oral communication professionally
iv. develop self-management skills during clerkship activities, reflecting accountability, adaptability, and ethical responsibility in a healthcare setting

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. Vanderah, T. W. (2023) Katzung's Basic & Clinical Pharmacology (16th ed.) McGraw Hill. (e-Book)
2. Brunton, L. & Knollman, B. (2022) Goodman and Gilman's The Pharmacological Basis of Therapeutics, 14th ed. McGraw Hill. (e-Book)
3. Ritter, J. M., Flower, R. J., Henderson, G. etc. (2023). Rang and Dale Pharmacology (10th ed.). Elsevier (e-Book)
4. Dipiro, J.T., Yee, G.C., & Haines, S.T. (2023). Pharmacotherapy: A Pathophysiologic Approach (12th ed.). McGraw-Hill. (e-Book)
5. Zeind, C. S., Carvalho, M. G., Cheng, J. W. M., etc. (2023) Applied Therapeutics: The Clinical Use of Drugs (Koda Kimble and Youngs Applied Therapeutics) Lippincott Williams and Wilkins. (e-Book)
6. Galt KA. (2006) Developing clinical practice skills for pharmacists. American Society of Health-System Pharmacists Publication.
7. Tietze KJ. (2012) Clinical skills for pharmacists: A patient-focused approach. St. Louis: Elsevier/Mosby.
8. Whittlesea, C. & Hodson, K. (2019). Clinical Pharmacy and Therapeutics. (6th ed.) Elsevier.
9. British National Formulary; 2025 or later edition.
10. Adult Drug Information Handbook. Lexi-Comp's Clinical Reference Library (2021) (30th Edition). American Pharmacists Association.
11. Up To Date
12. MIMS Drug Reference - Recent version
13. Various clinical practice guidelines

Marking and Assessment Methods

Continuous Assessment 100%

OIA4023 PHARMACY MANAGEMENT AND ENTREPRENEURSHIP (2 CREDITS)

Learning Outcomes

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

i. apply the principles of effective management in various settings relevant to the pharmacy profession.
ii. develop entrepreneurship skills for pharmacists
iii. solve management-related issues in various settings relevant to the pharmacy profession

Course Synopsis

Participants will apply the principles of effective management as well as develop their entrepreneurial skills for innovative projects. These principles and skills will be applied in solving management-related issues within diverse pharmacy profession settings.

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%

ELECTIVE COURSE

OIA3040 TRADITIONAL, COMPLEMENTARY AND INTEGRATIVE MEDICINE (3 CREDITS)

Learning Outcomes

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

i. describe the principles of traditional and complimentary medicine.
ii. describe the principles of traditional and complimentary medicine.
iii. illustrate the difference between traditional and complementary medicine and modern medicine.
iv. illustrate the difference between traditional and complementary medicine and modern medicine.
v. 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%

OIA3041 MICROBIOLOGY IN PHARMACY (3 CREDITS)

Learning Outcomes

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

i. explain the fundamentals of microbiology in pharmacy and important microorganisms relevant to pharmaceutical applications.
ii. explain secondary metabolites and microbial products that are significant in pharmaceutical development and applications.
iii. describe good practices and regulations in the production and utilization of sterile microbial products for pharmaceutical purposes.

Course Synopsis

This module provides knowledge and understanding of the significance of bacteria, yeasts, viruses and toxins in pharmaceutical raw materials, intermediates, products, and pharmacy production environments. It also emphasizes microbiological control of pharmaceutical products, production environments, and personnel involved.

Reference Texts

1. Geoff Hanlon & Norman A Hodges (2013). Essential Microbiology for Pharmacy and Pharmaceutical Science, Wiley-Blackwell.
2. Madhu Raju Saghee, Tim Sandle , Edward C. Tidswell (2011). Microbiology and Sterility Assurance in Pharmaceuticals and Medical Devices. Business Horizons.
3. Prahlad Singh Mehra (2011). A Textbook of Pharmaceutical Microbiology,I K International Publishing House

Marking and Assessment Methods

Continuous Assessment 100%

OIA3042 METHODS IN COMPUTER-AIDED DRUG DESIGN
(3 CREDITS)

Learning Outcomes

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

i. use bio- or cheminformatics tools and databases within pharmaceutical research.
ii. analyse the output from various online tools relevant to pharmaceutical bioinformatics.
iii. integrate the use of bio- and cheminformatics tools in pharmaceutical research.

Course Synopsis

This course is designed to give students a basic theoretical background and a working knowledge of the bioinformatics techniques that are related to pharmaceutical sciences. Emphasis will be placed on the application of the free tools available rather than the underlying theories and the course covers topics such as databases and tools, representation of molecules, alignment, artificial intelligence, docking, QSAR and pharmacophore that are useful in designing new drugs.

Reference Texts

1. Jarl E. S. Wikberg. Introduction to Pharmaceutical Bioinformatics, 4th Edition, Oakleaf Academic, 2020, ISBN 978-91-519-6000-5
2. Navneet Sharma, Himanshu Ojha, Pawan Raghav, and Ramesh Goyal. Chemoinformatics and Bioinformatics in the Pharmaceutical Sciences, 2021, eBook
3. Scolnick, E.M.. Drug Discovery and Design, London Academic, 2021, ISBN: 9780120342563
4. Marco Tutone and Anna Maria Almerico. Computational Approaches: Drug Discovery and Design in Medicinal Chemistry and Bioinformatics. MDPI AG, 2022, ISBN: 9783036527796.
5. Vivek Chavda, Krishnan Anand and Vasso Apostolopoulos. Bioinformatics Tools for Pharmaceutical Drug Product Development, 2023, eBook

Marking and Assessment Methods

Continuous Assessment 100%

OIA4021 INTRODUCTION TO COSMETIC PRODUCTS (3 CREDITS)

Learning Outcomes

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

i. describe the various types of cosmetic products.
ii. demonstrate the relevant skills in the manufacturing of cosmetic products.
iii. 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. Adejare, A. (Ed.). (2020). Remington: The science and practice of pharmacy (23rd ed.). Philadelphia, PA, USA: Academic press.
2. Guidelines on Good Manufacturing Practice (GMP) for Cosmetics. (2020). Ministry of health, Malaysia: National Pharmaceutical Regulatory Agency.
3. NPRA. (2022). GUIDELINES FOR CONTROL OF COSMETIC PRODUCTS IN MALAYSIA. National Pharmaceutical Regulatory Agency.
4. NPRA. (2022). Cosmetics Guideline - Annex I-VII. National Pharmaceutical Regulatory Agency
5. Draelos, Z. D., Dover, J. S., & Alam, M. (2024). Cosmeceuticals: Procedures in Cosmetic Dermatology Series (4th ed.). Elsevier
6. Srivastav, Y. (Ed.). (2025). Cosmetic and Cosmeceuticals: A Textbook. Ink Freedom Publication.
7. Adejare, A. (Ed.). (2020). Remington: The science and practice of pharmacy (23rd ed.). Philadelphia, PA, USA: Academic press.
8. Alexander, K., & Romanowski, P. (Eds.). (2025). Cosmetic Science: Formulation and Technologies. Springer Nature Switzerland.
9. Baki, G. (2023). Introduction to Cosmetic Formulation and Technology (2nd ed.). John Wiley & Sons.

Marking and Assessment Methods

Continuous Assessment 100%

OIA4022 ADVANCES AND INNOVATIONS IN PHARMACY
(3 CREDITS)

Learning Outcomes

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

i. identify emerging topics in pharmacy.
ii. discuss the relevance of emerging topics in pharmacy including within the local context.
iii. 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. Journals and online articles, reference materials 1-6
2. Ministry of Health Malaysia. HEALTH WHITE PAPER FOR MALAYSIA Strengthening people's health, future-proofing the nation's health system (2023)
3. Ministry of Health 2016. National Strategic Plan for Non-Communicable Disease (NSP- NCD) 2016-2025
4. Ministry of Health. PHARMACEUTICAL SERVICES PROGRAMME STRATEGIC PLAN, 2021-2025 (Website: www.pharmacy.gov.my)

Marking and Assessment Methods

Continuous Assessment 100%

OIA4024 HEALTH SUPPLEMENTS IN PHARMACY PRACTICE (3 CREDITS)

Learning Outcomes

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

i. describe the classification, mechanisms of action, regulatory aspects, and evidence-based use of health supplements in pharmacy practice.
ii. evaluate the safety and efficacy of various health supplements and recommend appropriate options based on patient needs and scientific evidence.
iii. demonstrate professional attitudes and responsibility in promoting rational and ethical use of health supplements through effective communication with patients.

Course Synopsis

This module introduces students to the role of health supplements in pharmacy practice. It covers the types, uses, safety, and regulations of products like vitamins, minerals, herbal supplements, and functional foods. Students will learn how to evaluate health supplements based on scientific evidence and how to provide proper advice to patients. The module also highlights the pharmacist's ethical and professional responsibilities in promoting safe and rational use of supplements, with a focus on effective communication with patients.

Reference Texts

1. Wallace, T. C., Dwyer, J. T., & Betz, J. M. (2024). Health professional's guide to dietary supplements. Academy of Nutrition and Dietetics
2. Braun, L., & Cohen, M. (2017). Essential Herbs and Natural Supplements. Elsevier Health Sciences.
3. Bokelmann, J. M. (2021). Medicinal Herbs in Primary Care-E-Book: An Evidence-Guided Reference for Healthcare Providers. Elsevier Health Sciences.
4. Al-Worafi, Y. M. (2024). Handbook of Complementary, Alternative, and Integrative Medicine: Education, Practice, and Research Volume 3: Research Evidence Based Clinical Practice. CRC Press.
5. Singh, R. B. (Ed.). (2021). Functional foods and nutraceuticals in metabolic and non-communicable diseases. Academic Press.

Marking and Assessment Methods

Continuous Assessment 100%

ATTENDANCE IN PROGRAMME OF STUDY

1. It is **compulsory** for a student to attend all teaching and learning activities related to his programme of study.

2. A student who does not attend any teaching and learning activities is required to inform the reason for his absence to the teacher immediately together with the relevant supporting documents. The teacher shall inform the student of the consequences of being absent and is responsible to keep the records of the notification and class attendance.

3. A student may with the approval of the Faculty undergo a part of the degree programme of study at other university or institution

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
*An overall mark of 50.00 and above, but fails either the continuous assessment component or the final examination component.	CF	1.70	Fail
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

*Applicable to students enrolled in programmes that are subject to programme standards requiring students to pass both the continuous assessment and final examination components. Where the overall mark is 49.99 or below, the original grade based on the overall mark will be awarded, regardless of whether the student fails one or both components of the continuous assessment and/or the final examination.

(Senate: 24.06.2026)

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.