

**Macao Polytechnic Institute**  
**School of Health Sciences and Sports**  
**Bachelor of Science in Biomedical Technology**  
**(Pharmacy Technology)**

**Module Outline**

**Academic Year 2021/ 2022 Semester 1**

<b>Learning Module</b>	Clinical Pharmacy I (臨床藥學 I)		<b>Class Code</b>	BSCP3101
<b>Pre-requisite(s)</b>	BSPY2101, BSPY2102			
<b>Medium of Instruction</b>	English / Cantonese		<b>Credit</b>	4
<b>Lecture Hours</b>	48 hrs	<b>Lab/Practice Hours</b>	12 hrs	<b>Total Hours</b> 60 hrs
<b>Instructor</b>	Lao Cheng Kin, Chatmann		<b>E-mail</b>	cklao@ipm.edu.mo
<b>Office</b>	Room M708, 7/F, Meng Tak Building, Main Campus		<b>Telephone</b>	8599-3473

**Description**

This 60-hour module is the first in a series of modules that train students in clinical pharmacy. The module systematically introduces clinical applications of drugs on various disorders. The pathophysiology, clinical features, diagnostic and monitoring parameters of common diseases will be focused. Emphasis will also be placed on the mechanisms of action, pharmacological effects, clinical indications, pharmacokinetics, and relevant adverse effects of the drugs used for the corresponding diseases.

**Learning Outcomes**

After completing the learning module, students will be able to:

1. Discuss the common risk factors and pathophysiology of the presented diseases.
2. Identify patient factors that may influence drug selection for treating a given disease state.
3. Recommend appropriate pharmacologic and non-pharmacologic treatments for a specific disease state.
4. Explain potential drug interactions, adverse drug reactions and adherence issues associated with certain drug therapies.
5. Describe the monitoring parameters and the key counseling points of certain drug therapies.

## **Content**

1. Introduction to clinical pharmacy (3 hours)
  - 1.1 What is clinical pharmacy?
  - 1.2 General approach of patient encounter
  - 1.3 SOAPing
  
2. Thrombosis: focus on venous thromboembolism (6 hours)
  - 2.1 Review of hemostasis
  - 2.2 Etiology and risk factors of thrombosis
  - 2.3 Clinical features and diagnostic considerations
  - 2.4 Treatment and monitoring of thrombosis
  - 2.5 Summary of recommendations
  
3. Dyslipidemia (5 hours)
  - 3.1 Lipoprotein metabolism
  - 3.2 Pathophysiology of atherosclerosis
  - 3.3 Assessment of dyslipidemia
  - 3.4 Management of dyslipidemia
    - 3.4.1 Clinical guidelines
    - 3.4.2 Monitoring and follow-up
    - 3.4.3 Non-pharmacologic therapies
    - 3.4.4 Pharmacologic therapies
  
4. **Case study session I (3 hours)**
  
5. Hypertension (5 hours)
  - 5.1 Epidemiology of hypertension
  - 5.2 Classifications of blood pressure and hypertension
  - 5.3 Management of hypertension
    - 5.3.1 Treatment goals/ when to start treatment?
    - 5.3.2 Lifestyle modifications
    - 5.3.3 Pharmacotherapy
  - 5.4 Hypertensive crisis – *Active learning topic*
  
6. Diabetes mellitus (5 hours)
  - 6.1 Epidemiology and classification
  - 6.2 Diagnosis of diabetes and pre-diabetes
  - 6.3 Complications and their managements
  - 6.4 Treatments of diabetes
  - 6.5 Monitoring for diabetes

7. **Midterm test (2 hours)**
  
8. Coronary artery diseases (6 hours)
  - 8.1 Epidemiology of coronary artery disease
  - 8.2 Classification of coronary artery diseases
  - 8.3 Pathophysiology of coronary artery diseases
  - 8.4 Clinical presentation of angina
  - 8.5 Treatments of angina
    - 8.5.1 Chronic stable angina
    - 8.5.2 Variant angina
  - 8.6 Diagnosis of acute coronary syndrome (ACS)
  - 8.7 Treatments of acute coronary syndrome (ACS)
    - 8.7.1 Initial pharmacotherapy for acute coronary syndrome (ACS) in emergency department
    - 8.7.2 Treatments of ST-segment elevation myocardial infarction (STEMI)
      - 8.7.2.1 Fibrinolytics
      - 8.7.2.2 PCI and CABG
    - 8.7.3 Treatments of unstable angina (UA) and Non-ST-segment elevation myocardial infarction (NSTEMI)
  - 8.8 Secondary prevention of myocardial infarction
  
9. **Case study session II (1 hour)**
  
10. Osteoporosis (3 hours)
  - 10.1 Review of bone remodeling
  - 10.2 Pathophysiology of osteoporosis
  - 10.3 Risk factors for osteoporosis and osteoporotic fractures
  - 10.4 Clinical presentations of osteoporosis
  - 10.5 Diagnosis of osteoporosis
  - 10.6 Prophylaxis and treatment of osteoporosis
  
11. Osteoarthritis (3 hours)
  - 11.1 Epidemiology of osteoarthritis
  - 11.2 Risk factors and pathophysiology of osteoarthritis
  - 11.3 Clinical features of osteoarthritis
  - 11.4 Non-pharmacologic and pharmacologic treatments of osteoarthritis
  
12. Rheumatoid arthritis (3 hours)
  - 12.1 Epidemiology of rheumatoid arthritis
  - 12.2 Pathophysiology of rheumatoid arthritis
  - 12.3 Clinical features of rheumatoid arthritis

- 12.4 Treatment options of rheumatoid arthritis
- 12.5 Treatment recommendations for rheumatoid arthritis

13. Asthma (4 hours)

- 13.1 Epidemiology of asthma
- 13.2 Etiology and pathophysiology of asthma
- 13.3 Diagnosis of asthma
- 13.4 Classification of asthma in patients  $\geq 12$  years of age
- 13.5 Management of chronic asthma
- 13.6 Management of severe acute asthma

14. Chronic obstructive pulmonary disease (1 hour) – *Active learning topic*

15. **Group presentation +/- community service (8 hours)**

16. **Final exam (2 hours)**

**Teaching Method**

Lectures, case studies, active learning topics, presentations, group discussion and/or community services.

**Attendance**

Attendance requirements are governed by the “Academic Regulations Governing Bachelor’s Degree Programmes of Macao Polytechnic Institute”. Students are not eligible to attend the final examination and re-sit examination if the absence rate exceeds 30%. Moreover, an “F” will be given as the final grade to students who have less than the stated attendance for this enrolled learning module.

## Assessment

This learning module is graded on a 100 point scale, with 100 being the highest possible score and 50 being the passing score. Any students scoring less than 35% of the total mark in the final examination will be given an “F” grade for the module even if the overall grade is 50% or higher. In addition, students will need to take the re-sit examination if they miss the final examination due to unreasonable absence and their maximum final score will be 50. Students are allowed to take final examination only if their attendance rate in practical sessions of this subject is over 90%.

	<b>Item</b>	<b>Description</b>	<b>Percentage</b>
1.	Case study sessions		6%
2.	Group presentation +/- community services	Absence from community services or the related training will result in zero point in this item.	19%
3.	Midterm test		35%
4.	Final exam		40%
<b>Total Percentage:</b>			<b>100%</b>

## Teaching Material(s)

### **Textbook(s)**

- DiPiro JT, Yee GC, Posey LM, et al. *Pharmacotherapy: a pathophysiologic approach*. 11<sup>th</sup> ed. New York: McGraw-Hill Medical; 2020. (Available at the *AccessPharmacy* database in the MPI Library website.)

## Reference

### **Reference book(s)**

- Zeind CS, Carvalho MG. *Applied therapeutics: the clinical use of drugs*. 11<sup>th</sup> ed. Philadelphia: Lippincott Williams & Wilkins; 2017.
- Lexicomp. *Drug information handbook: a clinically relevant resource for all healthcare professionals*. 29<sup>th</sup> ed. Lexi-Comp; 2020.
- Joint Formulary Committee. *British National Formulary 81*. Pharmaceutical Press; 2021.
- Gilbert DN, Chambers HF, Saag MS, et al. *The Sanford guide to antimicrobial therapy 2021*. 51<sup>st</sup> ed. Sperryville: Antimicrobial Therapy; 2021.
- Research articles and guidelines.