Syllabus: Cardiovascular System (111501206)

Second Semester 2024/2025

COURSE INFORMATION	
Course Name: Cardiovascular System. **Semester: Second Semester.** **Department:** Basic Medical Sciences. **Faculty:** Faculty of Medicine.	**Course Code: 111501206** **Section:** 2nd year medical students **Core Curriculum**: MD degree
Day(s) and Time(s): To be determine **Theory lectures: everyday 09:30 am – 1 pm** **Practical sessions: Variable.** **Classroom: TBD**	**Credit Hours:** 6 **Prerequisites**: None

COURSE DESCRIPTION

This system-based integrated module gives a comprehensive overview of cardiovascular system. It includes 53 lectures and 11labs. Each of the basic science topics is incorporated into an integrated body of knowledge covering anatomy including the developmental anatomy as well as the congenital anomalies, histology, and physiology of the cardiovascular system. It also includes the biochemical and pathological prevention methods of those diseases. It concentrates on drug therapy of common cardiovascular diseases such as hypertension ischemic heart disease, heart failure, and cardiac arrhythmias.

DELIVERY METHODS

The course will be delivered through a combination of active learning strategies. These will include:

- PowerPoint lectures and active classroom-based discussion
- Practical laboratories
- Video lectures
- E-learning resources: through Model and Microsoft Team

FACULTY INFORMATION

Name	**Dr. Arwa Al Anber**
Academic Title:	**Assistant Professor**
Office Location:	**1018**
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REFERENCE AND LEARNING RESOURCES

ANATOMY:

Author	Title	Published Year
G.J. Tortora,	Principle of Human Anatomy.	Latest edition.
R.S. Snell.	Clinical Anatomy for Medical Students.	Latest edition.
Carlos Junqueira. Last edition	Basic Histology	Latest edition.
K.L. Moore and T.V.N. Persaud	Before we are born	Latest edition.
Frank H. Netter	Atlas of Human Anatomy	Latest edition.
Anne M. R. Agur and Arthur F. Dalley	Grants Atlas of Anatomy	Latest edition.

PHYSIOLOGY:

Author	Title	Published Year
Richard E. Klabunde	Cardiovascular Physiology Concepts	Latest edition.
Guyton and Hall	Textbook of Medical Physiology	Latest edition.
William F. Ganong	Review of Medical Physiology	Latest edition.

PATHOLOGY:

Author	Title	Published Year
Emanualrubin	Essential Pathology	Latest edition.
Kumar, Cotran and Robbin	Basic Pathology	Latest edition.

PHARMACOLOGY:

Author	Title	Published Year
Lipincott's	Illustrated Review: Pharmacology	8th edition.

BIOCHEMISTRY:

Author	Title	Published Year
Robert K. Murray and Co.	Harper's Biochemistry	Latest edition.

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STUDENT LEARNING OUTCOMES MATRIX*

Program Learning Outcomes	Course Objectives	Course Student Learning Outcomes	Assessment Method
	1. Identify the anatomy of the mediastinum; heart borders, surfaces, chambers, and valves; and general and topographic of the great vessels and their distribution. 2. Describe the microscopic appearance of different parts of the cardiovascular system. 3. Describe the normal embryological development with their common congenital abnormalities.	**(A)Theory Lectures** **Anatomy** **Lecture (1): Mediastinum & Pericardium.** 1. Study the parts and contents of mediastinum. 2. Describe the outline and normal position of the heart. 3. Describe the general organization, surface landmarks & external features of the heart. List relations of different parts of the heart. 4. Define the pericardium, describe its component & its attachment to the diaphragm and the root of the great vessels. 5. Discuss the pericardial space, sinuses & the pericardial fluid in normal condition. 6. Describe blood supply& innervations of the pericardium. **Lecture (2): Heart chambers, valves, great vessels of the heart & conducting system.** 1. Describe the internal features of each chamber of the heart. 2. Describe the fibrous skeleton of heart. 3. Identify papillary muscles and describe their locations and importance. 4. Describe the atrioventricular, semilunar (pulmonary and aortic) valves, their position, functional importance, surface marking and ideal sites for their auscultation. 5. Describe the surface anatomy of great vessels entering and leaving the heart. 6. Describe different parts of the conductive system of the heart. **Lecture (3): Conductive system, blood supply and innervations of the heart.**	MCQ Exam

		1. Describe the arrangement of conductive system of the heart and their function within the myocardium. 2. Describe the origin of the coronary arteries and their course, branches, distribution & sites of anastomosis between branches of coronary arteries 3. Describe the normal variation in the course of the coronary arteries and their branches. 4. Describe the venous drainage of the heart and cardiac veins (their names, location and drainage areas). 5. Describe the location and termination of the coronary sinus and its tributaries. 6. Describe innervations of the heart and the principal of cardiac referred pain. **Lecture (4): Histology of the myocardium and blood vessels** 1. Describe the microscopic structure of the cardiac muscle and the histological appearance of the intercalated disc and Purknije fibers. 2. Describe the histological features of the endocardium, and epicardium. 3. Describe the histological appearance of arteries and veins and their differences. 4. Describe the histological features of different types of capillaries. **Lecture (5): Development of the heart.** 1. Describe the primary formation and folding of the heart. 2. Describe the formation of different chambers of the heart. 3. Understand and describe the establishment of fetal circulation and its hemodynamics and subsequent cardiovascular changes that take place after birth. 4. Describe and understand causes of major malformation incurred during these developmental stage and their clinical implications. **Lecture (6): Blood vessels I – Arterial system:** **a. Arteries in the head and neck regions.** 1. Describe the course, relations and branches of the ascending aorta and arch of aorta. 2. Describe the common carotid, and external and internal carotid arteries concerning with their course, relations and branches. 3. Describe branches of the subclavian artery in the head and neck regions.	

		Lecture (7): Blood vessels I – Arterial system: **b. Arteries in the thorax, abdomen and pelvis regions.** 1. Describe the course, relation and branches of the descending thoracic aorta. 2. Describe the course, relations and branches of the descending abdominal aorta. 3. Describe the course, relations and branches of the common iliac artery. 4. Describe the course, relations and branches of the internal iliac artery. 5. Describe the course, relations and branches of the external iliac artery. **Lecture (8): Development of the vascular system** 1. Describe the formation of dorsal aorta. 2. Describe the formation of aortic arches and their fate. 3. Revise the process of transformation of fetal into adult circulation and the major changes that occur. Describe major congenital malformations incurred during these stages and their clinical implications. **Lecture (9): Blood Vessels I –Arterial system: c. Arteries in the upper Limb region.** 1. Describe the course, relations and branches of the axillary artery. 2. Describe the course, relations and branches of the brachial artery. 3. Describe the anastomosis around the shoulder and scapula. 4. Describe the course, relation and branches of the radial artery. 5. Describe the course, relation and branches of the ulnar artery. 6. Describe the anastomosis around the elbow and wrist joints. 7. Describe the locations and branches of the superficial and deep palmar arches. **Lecture (10): Blood vessels I –Arterial system: d. Arteries in the lower limb region.** 1. Describe the course, relations and branches of the femoral& the profundafemoris arteries.	

		2. Describe the course, relations and branches of the popliteal artery. 3. Describe the cruciate and trochanteric anastomosis. 4. Describe the course, relations and branches of the anterior tibial artery. 5. Describe the course, relations and branches of the posterior tibial artery. 6. Describe the anastomosis around the knee joint. 7. Describe the course, relations and branches of the dorsalispedis, medial plantar and lateral plantar arteries. 8. Describe the location and branches of the plantar arch. **Lecture (11): Blood vessels II – Venous system.** 1. Describe the caval system (course and relations of superior and inferior vena cava). 2. Describe tributaries of the superior vena cava draining the head, neck and upper limb. 3. Describe tributaries of the inferior vena cava draining the abdomen, pelvis and lower limbs. 4. Describe the azygos system and its drainage area. 5. Describe the important surface landmarks of major veins from clinical point of view. 6. Describe the portal venous system. 7. Describe cavo-caval and porto -caval anastomosis.	
	Describe and understand the electrocardiogram cardiac cycle, hemodynamics, regulation of blood flow and blood pressure, microcirculations, and the mechanism of circulatory shock.	**Physiology** **Lecture 1: Functional design of the CVS** 1. Describe the basic function of various parts of CVS. 2. Describe the systemic and pulmonary circulations. 3. Define Properties of Cardiac muscles. 4. Describe Automaticity. **Lecture 2: Properties of cardiac muscle (Conductivity, Excitability, Contractility)** 1. Describe conduction of the conductive system of the heart; the control role of the ANS. 2. Describe cardiac muscle action potential and its components. 3. Describe refractory period and excitation contraction coupling. **Lecture 3: Mechanical events in cardiac cycle** 1. Define cardiac cycle and its phases. 2. Be familiar with and explain curves for the various events occurring in the heart, inlet veins, and outlet arteries. 3. Describe the timing and causes of the four heart sounds.	MCQ Exam

		4. Define murmurs and how systolic and diastolic murmurs are produced. **Lecture 4&5: Cardiac output and its regulation** Define the cardiac output (COP) and cardiac index. 1. Describe the relationship between cardiac output, stroke volume and the heart rate. 2. Explain the relationship between EDV and ventricular performance (Frank-Starling curve). 3. Describe factors affecting EDV, COP and define cardiac reserve. 4. Describe the energy expended and O_2 utilization by the heart. 5. Understand methods of determination of cardiac output. **Lecture 6: The electrocardiogram I** 1. Describe the principles of voltage recording in a volume conductor and its application to recording from the heart. 2. Explain ECG waveforms and intervals in relation to the instantaneous pathway of waves of depolarization through the cardiac muscle. 3. Identify voltage and time calibration of the ECG. 4. Explain the normal ECG. **Lecture 7: The electrocardiogram II** 1. Explain the differences in QRST configuration in various leads. 2. Define mean electrical vector (axis) of the heart and give the normal range. 3. Determine the mean electrical axis from knowledge of the magnitude of the QRS complex in the standard limb leads. 4. State the right and left deviations of the electrical axis of the heart. 5. Use QRS vector analysis of electrocardiogram recordings to identify atrial and ventricular hypertrophy as well as abnormal myocardial conduction pathways. **Lecture 8: The electrocardiogram III** 1. Describe the alteration in conduction responsible for most common arrhythmias. 2. Identify myocardial ischemia, injury, and infarction from electrocardiogram recordings. **Lecture 9: Hemodynamics and Biophysics** 1. Describe factors affecting the peripheral resistance. 2. Define factors that determine laminar and turbulent blood flow. 3. Describe blood velocity & blood flow through various parts of CVS in relation to their cross-sectional area. 4. Discuss the application of Laplace law. **Lecture 10&11: Blood pressure and blood flow** 1. Define blood pressure and state that it is determined by the cardiac output and total peripheral resistance. 2. Define hydrostatic pressure and compare the magnitude of arterial	

		pressure in the head and feet in the recumbent and standing position. 3. Define systolic, diastolic, pulse, and mean pressure and give their normal values. 4. Understand that the central nervous mechanisms regulating blood pressure . 5. State that regulation is achieved by changing: peripheral resistance, venous capacity, heart rate, and stroke volume. 6. Discuss the short term, intermediate and long term regulation of blood pressure and blood flow. 7. Differentiate between essential hypertension, secondary hypertension and clarify the effect of hypertension on the human body. **Lecture 12: Coronary circulation** 1. Explain normal coronary blood flow during systole and diastole to different parts of the myocardium. 2. Discuss the local factors for control of coronary blood flow, local metabolism as primary factor, and the oxygen demand. 3. Describe the effect of autonomic nervous system on coronary arteries, role of Alpha, and Beta-receptors. 4. Define ischemic heart disease, the cause of cardiac pain, and the mechanism of collateral circulation. **Lecture 13: Cardiac output and muscle blood flow during Exercise** 1. Describe muscular blood flow during exercise. 2. Discuss circulatory adjustment during exercise. 3. Discuss the relationship of cardiovascular performance to the level of O2 consumption during exercise. **Lecture 14: Heart failure & circulatory shock** 1. Define heart failure, and the difference between low output and high output heart failure. 2. Describe etiology and basic pathophysiology of chronic heart failure (CHF). 3. Define circulatory shock, and the difference between cardiogenic and hypovolumic shock. 4. Describe sympathetic reflex compensation in shock. 5. Discuss the effects of shock on the human body.	
	Define with the more common types of cardiovascular diseases with emphasis on (aetiology, mechanism and briefly to correlate the	**Pathology** **Pathology 1&2: atherosclerosis** Describe the: Typical Response to Vascular Injury (Intimal Thickening).	MCQ Exam

	pathological aspects of diseases with clinical manifestations).	Major Modifiable & Non-Modifiable Risk Factors for Atherosclerosis. Aetiology & Pathogenesis of Atherosclerosis. Gross &Microscopical Features of the Early Fatty Streaks & Late Atheromatous Plaques. Describe the Sequences, Effects & Complications of Atherosclerosis Describe The Pathological Features of Hyaline &Hyperplastic Arteriolosclerosis **Pathology 3&4** **Ischemic heart disease (IHD)** Describe the pathogenesis of IHD with emphasis on the Role of: Acute Plaque Change, Thrombosis, Inflammation, & Vasoconstriction. Pathological & Clinical Features of Stable & Unstable Angina Pectoris, Chronic IHD & Sudden Cardiac Death (SCD) Etiology, Sites, Progression, Gross& Microscopic changes Features of Acute Myocardial Infarction (MI). Consequences, Effects & Complications of Acute Myocardial Infarction. Describe hypertensive heart disease **Pathology 5,6,7** **(Cardiomyopathy, Myocarditis, Pericarditis, & Rheumatic heart disease)** Describe the: Etiology, Pathogenesis, Types, Pathological Features, & Effects of Cardiomyopathies. Etiology& Pathogenesis of The Different Types of Myocarditis. Types, Causes, Pathological Features, Effects & Complications of Pericarditis Causes & Types of Pericardial Hemorrhages& Effusions Rheumatic heart disease Describe the: Etiology, Pathogenesis, Sites of Involvement, Gross & Microscopic Features, & Effects & Complications Of Acute & Chronic Rheumatic Heart Disease (RHD). Endocarditis valvular disease	

		Describe the Etiology, Pathogenesis, Predisposing Factors, Types, Gross & Microscopic Features, Effects & Complications of Infective Endocarditis. Enumerate the Causes, Effects & Complications of each of the following valvular lesions: Aortic Stenosis & Aortic incompetence, Mitral stenosis & Mitral incompetence. **Pathology 8 (Aneurysms & Aortic Dissection)** List The Types of Aneurysms According to Their Etiology. Describe the Etiology, Pathogenesis, & Pathological Features, & Types of: (1) Aortic Atheromatous Abdominal Aneurysm (AAA). (2) Aortic Dissection. Describe then Effects & Complications of Aneurysms in General. **Pathology 9 (Vasculitis &Varicose veins)** Describe the: pathogenic Mechanisms of Vasculitis. Sites & Pathological Features of The Main Types of Vasculitis: Temporal &Takayasu Arteritis, Polyarteritis Nodosa, Kawasaki Disease, Microscopic Polyangiitis, Wegener Granulomatosis, List the main Benign, Intermediate, & Malignant Tumours of Blood Vessels &Lymphatics Lower Extremity Varicose Veins.	
	Understand the mechanisms of action, pharmacological actions, pharmacokinetics, uses and adverse effects of commonly used drugs in the treatment of cardiac failure, angina pectoris, cardiac	**Pharmacology** **A) Drugs for hyperlipidemia lecture 1:** 1. To understand key pharmacologically relevant dyslipidaemia mechanisms 2. To familiarize with different categories of antihyperlipidemic 3. To understand the mechanism of action of statins, their clinical relevance, uses, and main adverse effects.	MCQ Exam

	arrhythmias and hypertension.	4. To understand the mechanism of action of fibrates and their role as lipid-lowering agents and their main adverse effects. 5. To describe the role of niacin in the treatment of hyperlipidemia. 6. To identify the currently available bile acid sequestrants, their therapeutic indications, and adverse effects. 7. To understand the mechanism of action, therapeutic uses, and advantages of proprotein Convertase Subtilisin kexin type 9 inhibitors. 8. To learn the role of omega 3 fatty acids in the treatment of dyslipidemia. 9. To compare the different effects of the antihyperlipidemics on the lipid profile. 10. To familiarize with the up-to-date guidelines for the treatment of dyslipidemia. **B) Antiarrhythmic drugs**: Lectures 2 & 3 1. Sodium channel blockers. a. Quinidine, disopyramide& procainamide. b. Lidocaine & phenytoin. c. Propafenone. 2. β-adrenoceptor blockers. 3. Potassium channel blockers: amiodarone. 4. Slow calcium channel blockers. 5. Others: adenosine, digoxin. Some of these drugs will be discussed more elsewhere (β-blockers, calcium channel blockers, digoxin, lidocaine and phenytoin). Discuss the pharmacological actions, adverse effects, precautions and specific clinical indications of antiarrhythmic drugs. **c) Antianginal drugs: lectures 4 & 5** 1. Classification: a. Beta-adrenergic blockers. b. Organic nitrates. c. Calcium channel blockers. 2. Discuss their mechanism of action, pharmacological actions, adverse effects and clinical uses of these drugs. 3. Treatment of myocardial infarction. **D) Antihypertensive drugs: Lectures 6-8**	

		1. Diuretics in hypertension regarding their pharmacological actions, adverse effects, precautions and therapeutic indications. 2. Sympathetic blockers: a. α-adrenergic blockers: prazosin. b. β-adrenergic blockers: atenolol, bisoprolol, ... 3. Calcium channel blockers: dihydropyridines (nifedipine, nicardipine, amlodipine, etc.). Verapamil & diltiazem. 4. Angiotensin-converting enzyme (ACE) inhibitors (captopril, enalpril, lisinopril....). 5. Angiotensin receptor blockers 6. Centrally-acting drugs: methyldopa and clonidine. **7.** Vasodilators: Sodium nitroprusside, diasoxide, hydralazine & minoxidil, **E) Drugs used in heart failure: lectures 10-11.** A. ACE Inhibitors and Angiotensin Receptor Antagonists. B. Diuretics. C. β-adrenergic blockers. Discuss diuretics in heart failure regarding their pharmacological actions, adverse effects, precautions and therapeutic indications. Discuss β-adrenergic blockers in heart failure regarding their pharmacological actions, adverse effects, precautions and therapeutic indications Discuss ACE Inhibitors and angiotensin II antagonists regarding their pharmacological actions, adverse effects, precautions and therapeutic indications D. Cardiac glycosides 1. Discuss mechanism of action of cardiac glycosides. 2. Discuss their pharmacological actions, uses, adverse effects and contraindication 3. Discuss interactions of digoxin and treatment of toxicity. E. Positive inotropic drugs, dobutamine, dopamine and milrinone.	
	Understand cholesterol metabolism and its main regulatory factors	**Biochemistry** - Illustrate the pathway of cholesterol Biosynthesis - Distinguish the mechanisms by which cholesterol biosynthesis is regulated by energy availability, hormones, food intake and pharmacological manipulation. - Interpret the effect of up-regulating or down-regulating plasma cholesterol levels	MCQ Exam

	Recognize the role and types of lipoproteins	on the intracellular synthesis of cholesterol, and the transcriptional regulation of genes that are involved in cholesterol homeostasis. - Identify the statins as the main therapeutic intervention in dyslipidemia/atherosclerosis and interpret their action in terms of the inhibition of HMG CoA reductase. - Compare and contrast the life cycle of the various lipoprotein particles with respect to their composition, metabolism and transport. - Discuss the molecular basis of atherosclerotic plaque formation - Categorize the different hyperlipidemias.	
	Recognize the clinical relevance of cardiac enzymes, troponins and myoglobin in the diagnosis of acute myocardial diseases	- list Cardiac enzymes elevated in myocardial damage - Discuss myoglobin and troponins as markers for myocardial infarction	
	Discuss Energy fuels used by the heart	- Describe major sources of energy for the cardiac muscle tissue - Discuss Myocardial metabolic adaptations during ischaemia	
	Public Health Significance Tasks of cardiovascular Epidemiology a. Descriptive Epidemiology, b. Analytic epidemiology, c. Experimental epidemiology/Interventions Risk factors for cardiovascular diseases and prevention cardiovascular diseases. Factors Influencing Susceptibility to CV Infection.	**Community medicine** **Epidemiology of CVdiseases** 1. To understand public health significance of CVDs, regarding the global incidence and prevalence of CVDs. 2. To know the risk factors for CVDs. 3. Discuss some important CV problems and the impact of CVDs on the health of individuals. **4.** Understand preventive measures. **Infections of the Cardiovascular System** 1. Factors Influencing Susceptibility to CV Infection 2. Types of CVS Infections Prevention of CVS Infections	MCQ Exam

(B) PRACTICAL SESSIONS			
Program Learning Outcomes	**Course Objectives**	**Course Student Learning Outcomes**	**Assessment Method**

	Morphological and surface anatomy of the heart and mediastinum.	1. Outline the divisions of thoracic cavity. 2. Study the parts of mediastinum and their contents. 3. Understand the layers, extension, relations, attachments, and sinuses of pericardium. 4. Describe the normal location and surface marking of the heart, and great vessels. 5. Appreciate important relations of the heart in the middle mediastinum. 6. Study the internal features of heart chambers (atria & ventricles). 7. Study the course and branches of right and left coronary arteries. 8. Identify images of the heart and its blood supply in plain chest X-ray, angiograms and CT scans.	MCQ Exam
	Histology of the heart and blood vessels.	1. Examine the detailed microscopic structure of the cardiac muscle. 2. Examine, compare and understand the microscopic structure of walls of different calibre vessels.	MCQ Exam
	Morphological and surface anatomy of blood vessels in the thorax, head and neck, and upper limb regions.	1. Study the main arteries and veins and their branches in the thorax. 2. Study the main arteries and veins and their branches in the head and neck. 3. Study the main arteries and veins and their branches in the upper limb. 4. Study and identify the above arteries in angiograms.	MCQ Exam
	Morphological and surface anatomy of blood vessels in the abdomen, pelvis and lower limb regions.	1. Study the main arteries of veins and their branches in the abdomen and pelvis. 2. Study the main arteries of veins and their branches in the lower limb. 3. Study and identify the above arteries in angiograms.	MCQ Exam
	ECG	1. Demonstrate the methods of recording ECG. 2. Recording ECG in the 12 ECG leads. 3. Explain why the same cardiac muscle AP that is recorded in 12 ECG shows different wave deflections. 4. How to interprets the recorded ECG (waves & intervals, NSR). 5. Method of heart rate calculation. 6. The determination of the mean electrical axis of the heart.	MCQ Exam

		7. Demonstration of the effect of deep inspiration & expiration on heart rhythm (NSA).	
	Measurement of blood pressure and Heart sounds	1. Explain the principle of the indirect methods of BP measurement. 2. Describe the different parts of the mercury sphygmomanometer. 3. Explain the palpation & auscultation methods for BP measurement demonstrating the difference between the two methods. 4. Demonstrating the effect of exercise on systolic, diastolic & pulse pressure with explanation of the mechanism. 5. Demonstrate the locations on chest wall to hear the maximal intensity of heart sounds.	MCQ Exam
	Pathology of the heart and vessels	After reviewing and discussing the coloured photographs of the (1) gross and of the (2) histopathological sections given in the lectures as a power point presentations, the student should be able to identify, describe and diagnose the common and the important pathological lesions of the various vascular and cardiac disorders given in the CVS Module.	MCQ Exam
	Lipid profile	1. Understand how serum cholesterol, triglyceride, LDL & HDL levels can be determined in a clinical laboratory. 2. Discuss methods used in the laboratory to quantitative different types of lipoproteins. 3. Know the desirable levels & the risk levels of lipids to avoid heart attack.	MCQ Exam

ACADEMIC SUPPORT

It is The Hashemite University policy to provide educational opportunities that ensure fair, appropriate and reasonable accommodation to students who have disabilities that may affect their ability to participate in course activities or meet course requirements. Students with disabilities are encouraged to contact their Instructor to ensure that their individual needs are met. The University through its Special Need section will exert all efforts to accommodate for individual's needs.

Special Needs Section: Student Services and care Unit
Tel: 053903333 ext.4132/ 4583/ 5023
Location: Deanship of Students Affairs
Email: Stydent@hu.edu.jo

COURSE REGULATIONS

Participation

Class participation and attendance are important elements of every student's learning experience at The Hashemite University, and the student is expected to attend all classes. A student should not miss more than 15% of the classes during a semester. *Those exceeding this limit of 15% will receive a failing grade regardless of their performance*. It is a student's responsibility to monitor the frequency of their own absences. **Attendance record begins on the first day of class irrespective of the period allotted to drop/add and late registration. It is a student's responsibility to sign-in; failure to do so will result in a non-attendance being recorded.**

In exceptional cases, the student, with the instructor's prior permission, could be exempted from attending a class provided that the number of such occasions does not exceed the limit allowed by the University. The instructor will determine the acceptability of an absence for being absent. A student who misses more than 25% of classes and has a valid excuse for being absent will be allowed to withdraw from the course.

Plagiarism

Plagiarism is considered a serious academic offence and can result in your work losing marks or being failed. HU expects its students to adopt and abide by the highest standards of conduct in their interaction with their professors, peers, and the wider University community. As such, a student is expected not to engage in behaviours that compromise his/her own integrity as well as that of the Hashemite University.

Plagiarism includes the following examples and it applies to all student assignments or submitted work:

- **Use of the work, ideas, images or words of someone else without his/her permission or reference to them.**
- **Use of someone else's wording, name, phrase, sentence, paragraph or essay without using quotation marks.**
- **Misrepresentation of the sources that were used.**

The instructor has the right to fail the coursework or deduct marks where plagiarism is detected

Late or Missed Assignments

In all cases of assessment, students who fails to attend an exam, class project or deliver a presentation on the scheduled date without prior permission, and/or are unable to provide a medical note, will automatically receive a fail grade for this part of the assessment.

Submitting a term paper on time is a key part of the assessment process. Students who fail to submit their work by the deadline specified will automatically receive a 10% penalty. Assignments handed in more than 24 hours late will receive a further 10% penalty. Each subsequent 24 hours will result in a further 10% penalty.

- In cases where a student misses an assessment on account of a medical reason or with prior permission; in line with university regulations an incomplete grade for the specific assessment will be awarded and an alternative assessment or extension can be arranged.

Student Complaints Policy

Students at The Hashemite University have the right to pursue complaints related to faculty, staff, and other students. The nature of the complaints may be either academic or non-academic. For more information about the policy and processes related to this policy, you may refer to the students' handbook.

COURSE ASSESSMENT

Course Calendar and Assessment

Students will be graded through the following means of assessment and their final grade will be calculated from the forms of assessment listed below with their grade weighting taken into account. The criteria for grading are listed at the end of the syllabus.

Assessment	Grade Weighting	Deadline Assessment
Mid Exam and Practical Exam	60%	TBD
Final Exam	40%	TBD

Description of Exams

Test questions will predominately come from material presented in the lectures. Exam will consist of multiple-choice questions.

Grades are not negotiable and are awarded according to the following criteria*:

Letter Grade	Description	Grade Points
A+	Excellent	4.00
A		3.75
A-		3.50
B+	Very Good	3.25
B		3.00
B-		2.75
C+	Good	2.50
C		2.25
C-		2.00

D+	Pass	1.75
D	Pass	1.50
F	Fail	0.00
I	Incomplete	-

WEEKLY LECTURE SCHEDULE AND CONTENT DISTRIBUTION

Subject	Number of Lectures	Number of Labs	Lecturers
Anatomy	11	4	Dr. Amany, Dr. Ziad
Physiology	14	2	Dr. Shaimaa Amin
Biochemistry	4	1	Dr. Wallaa Biomy
Pathology	9	2	Dr. Dua Abuquteish. Dr. Ghadah Al- Jussani
Pharmacology	11	-	Dr. Arwa Al Anber
Community Medicine	2	-	Dr. Lara Al -Natour
Clinical Skills		2	Dr. Gorden Zubrod
Clinical lectures	2	-	Dr. Hamzeh Almomani &Dr Tayseer Al_ Tawarah
Total	53	11	