



# Course Specification (2025-2026)

<b>First part</b>
<b>1- Applied Anatomy</b>
<b>2- Applied Physiology</b>
<b>Second part</b>
<b>3- Rheumatology</b>
<b>4- Rehabilitation medicine</b>



**Benha University**  
**Faculty of Medicine**  
**Department of Human Anatomy and Embryology**

**Applied Anatomy Course Description for the Doctorate in  
 Rheumatology, Rehabilitation, and Physical Medicine**

<b>1. Course data</b>		
<b>Band/Level: PhD Part 1</b>	<b>Course Name: Applied Anatomy</b>	<b>Code: RHUM 701</b>
<b>Number of academic units: Theoretical 5 credit hours</b>		<b>Specialization : PhD in Rheumatology, Rehabilitatio n and Physical Medicine</b>
<ul style="list-style-type: none"> <li>a. <b>Get</b> knowledge of the anatomy and surface landmarks of major joints and soft tissue structures,</li> <li>b. <b>Apply</b> knowledge of the appropriate system structures relevant to rheumatology and musculoskeletal medicine,</li> <li>c. <b>Be qualified</b> to make a proper diagnosis of different musculoskeletal disorders of nerves, muscles, joints and central nervous system.</li> <li>d. <b>Maintain</b> and improve his standards of knowledge by self-education as a researcher and specialist in the field of Rheumatology, Rehabilitation and Physical Medicine.</li> </ul>		Course .1 objective:
The objective of teaching the course .2 <i>By the end of the course, the student should be able to:</i>		
<b>By the end of the course, students should be able to:</b> <b>2.a.1.List</b> different joint types in human body (upper limb, lower limb and vertebral column). <b>2.a.2.Describe</b> the anatomical structure and biomechanics of different joint types (stability and movements). <b>2.a.3.Outline</b> nerves and plexuses of the upper and lower limb. <b>2.a.4.Define</b> the origin and insertion of the muscles of upper, lower limbs and back. <b>2.a.5.Illustrate</b> cranial nerves. <b>2.a.6. Discuss</b> different areas of the brain and their function		<b>A- Knowledge and understandin g:</b>



<p><b>2.b.1. Correlate</b> basic science of anatomy to different skeletal deformities</p> <p><b>2.b.2. Interpret</b> basic science of anatomy to connective tissue, bone, joint, and muscle diseases,</p> <p><b>2.b.3. Analyze</b> sites of the nerve compression,</p> <p><b>2.b.4. Interpret</b> physical tests to evaluate musculoskeletal disorders,</p> <p><b>2.b.5. Assess</b> biomechanical principles of joint function in the prescription of orthoses and prostheses,</p> <p><b>2.b.6. Solve</b> problems of neurological injuries.</p>	<b>B- Mental skills:</b>
<p><b>2.c.1. Show</b> the dermatomal and myotomal supply of the body segments,</p> <p><b>2.c.2. Identify</b> accurate surface marking and anatomical landmarks needed for injecting joints and soft tissue rheumatic disorders,</p> <p><b>2.c.3. Make</b> suggestions in calculating the patient age,</p> <p><b>2.c.4. Perform</b> correction of different alignment,</p> <p><b>2.c.5. Assess</b> the progress of different deformities,</p> <p><b>2.c.6. Create</b> physical examination protocols for evaluating musculoskeletal disorders.</p>	<b>C- Course-specific professional skills:</b>
<p>2.d.1. Use information and communication technology effectively in the field of anatomy</p>	<b>D- General skills:</b>



Subject	Lectures (hrs)	Small group (hrs)	Total (hrs)	% of Total	ILOs	Course content: .3
<b><u>1) GENERAL ANATOMY</u></b> - Bones, - Joints (classification, structure & movements), Muscles (types, features & characters of skeletal muscles), Nerves (spinal & motor cranial), Autonomic nervous system (centers, nerves & ganglia), Ligaments & fasciae.	7	3	10	13%	2.a.1, 2.a.2,, 2.a.3,, 2.a.4,, 2.a.5, 2.b.2, 2.b.3, 2.c.1, 2.c.2, 2.c.3	
<b><u>2) NECK AND TRUNK</u></b> - Vertebral canal & vertebral foramina, - Posture, - Body weight transmission, - Ligaments & fasciae, Muscles, Joints, - Movements, - Intervertebral disc, - Diaphragm, Heart & pericardium, Respiratory system, Respiratory muscles movements.	11	8	19	27%	2.a.3, 2.a.6 2.b.1. , 2.c.4, , 2.c.6., 2.d.1 2.b.3	
<b><u>3) UPPER AND LOWER LIMBS</u></b> - Muscles, Nerves, Joints, - Ligaments & fasciae, - Stability, - Nerve plexuses, - Development, - Hand, Foot, Arches of the foot, - Grip-force transmission,	12	8	20	29%	2.b.1,, 2.b.3, 2.b.4, 2.b.5, 2.b.6, 2.c.5, 2.a.4, 2.d.1	



- Mechanisms of walking, running & standing.							
<b>4) NEUROANATOMY</b> - Brain & spinal cord: (blood supply & meninges), - Internal capsule: (afferent & efferent pathways), Nerve plexuses: (formation, relations & branches).	<b>17</b>	<b>9</b>	<b>26</b>	<b>31%</b>	<b>2.a.3, a.b.3, 2.b.6</b>		
<b>Total</b>	<b>47</b>	<b>28</b>	<b>75</b>	<b>100%</b>			



1. Lectures
2. Tutorials
3. Seminars
4. On line lectures : BU-LMS benha university learning management system

Teaching and learning methods .4

**Teaching Methods Matrix with Learning Outcomes for the Applied Anatomy Course**

Teaching methods			Course learning outcomes
Seminars	Tutorial	Modified Lectures	
■		■	2.a.1
■		■	2.a.2
■		■	2.a.3
■	■	■	2.a.4
■		■	2.a.5
■		■	2.a.6
■		■	2.b.1
■	■	■	2.b.2
■		■	2.b.3
■		■	2.b.4
■		■	2.b.5
■	■	■	2.b.6
■		■	2.c.1
■		■	2.c.2
■		■	2.c.3
■		■	2.c.4
■		■	2.c.5
■	■	■	2.c.6
■		■	2.d.1

**Knowledge and Understanding**

**Cognitive Skills**

**Professional Skills**

**General Skills**

Student evaluation:6



1. **Written exams:** Assess knowledge & understanding and intellectual skills.
2. **Structured oral exams:** to assess knowledge and understanding, intellectual, professional and general and transferable skills.

**A- Methods used**

**Assessment Methods Matrix with Learning Outcomes for the Applied Anatomy Course**

Learning methods		Course learning outcomes	
Structured Oral Exam	Written exam		
■	■	2.a.1	<b>Knowledge and Understanding</b>
■	■	2.a.2	
■	■	2.a.3	
■	■	2.a.4	
■	■	2.a.5	
■	■	2.a.6	
■	■	2.b.1	<b>Cognitive Skills</b>
■		2.b.2	
	■	2.b.3	
	■	2.b.4	
	■	2.b.5	
■		2.b.6	
■		2.c.1	<b>Professional Skills</b>
■		2.c.2	
■		2.c.3	
■		2.c.4	
■		2.c.5	
■		2.c.6	
■		2.d.1	<b>General Skills</b>

- Final exam at May or November

**B- Timing**



<ul style="list-style-type: none"><li>Examination Marks allocated<ul style="list-style-type: none"><li>a- Written: 150</li><li>b- Oral: 100</li></ul></li></ul> Total :250	<b>C- Distribution of grades</b>
7- List of textbooks and references:	
<ul style="list-style-type: none"><li>Lectures notes</li></ul>	notes
Gray's Anatomy 42nd Edition <b>The Anatomical Basis of Clinical Practice</b> Standring, S. (Ed.). (2020). <i>Gray's anatomy e-book: the anatomical basis of clinical practice</i> . Elsevier Health Sciences.	Compulsory books
Hole's Human Anatomy & Physiology 15th Edition by David Shier (Author), Jackie Butler (Author), Ricki Lewis (Author)  Hole, J. W., Shier, D., Butler, J., & Lewis, R. (2019). <i>Hole's essentials of human anatomy &amp; physiology</i> . Boston.	Suggested books
<a href="https://www.coursera.org/specializations/anatomy">https://www.coursera.org/specializations/anatomy</a>	scientific journals or newsletters



### Course Contents/ILOs Matrix

ILOs Course Content	2.a. Knowledge and understanding						2.b. Intellectual Skills						2.c.3. Practical & Clinical skills						2d. General and transferable
	2.a.1	2.a.2	2.a.3	2.a.4	2.a.5	2.a.6	2.b.1	2.b.2	2.b.3	2.b.4	2.b.5	2.b.6	2.c.1	2.c.2	2.c.3	2.c.4	2.c.5	2.c.6	2.d.1
1) General anatomy	x	x	x	x	x			x	x				x	x	x				
2) Head and neck Disease			x			X	x		x							x		x	x
3) upper and lower limbs				x			x		x	x	x						x		x
4) neuroanatomy			x						x			X							

رئيس مجلس القسم العلمي  
إ.د. أسامة فؤاد

جامعة بنها  
كلية الطب البشري  
قسم الفسيولوجيا الطبية



**Applied Physiology Course Description**  
**Doctorate in Rheumatology, Rehabilitation, and Physical Medicine - Updated Regulations**

Course data .5		
Band/Level: PhD Part 1	Course Name: Applied Physiology	: code RHUM 702
Number of academic units: Theoretical credit hours 5		Speciality: Rheumatology , Rehabilitation and Physical Medicine
<p><i>The overall goals of the course are to:</i></p> <ul style="list-style-type: none"> <li>• <b>Respond</b> to the educational and research training needs of doctors with a special interest in Rheumatology, Rehabilitation and Physical Medicine.</li> <li>• <b>Prepare</b> a Rheumatology, Rehabilitation and Physical Medicine physician oriented with the physiology of muscle and nerve, CNS and endocrine.</li> <li>• <b>Provide</b> graduates with enough knowledge about the regulation of body temperature, body fluids and homeostasis.</li> <li>• <b>Maintain</b> and improve students' standards of knowledge by self-education as a researcher and specialist in the field of Rheumatology, Rehabilitation and Physical Medicine.</li> </ul>		Course .6 :objective
The objective of teaching the course .6		
<i>By the end of the course, the student should be able to:</i>		



<p>By the end of the course, students should be able to:</p> <p><b>2.a.1.Describe</b> the physiology of the muscle contraction and relaxation.</p> <p><b>2.a.2.List</b> the normal physiological changes in exercise.</p> <p><b>2.a.3.Define</b> action potentials and motor end plate.</p> <p><b>2.b.4.Mention</b> the different types of receptors.</p> <p><b>2.a.5.Classify</b> the nature of pain and pain control systems.</p> <p><b>2.a.6.Name</b> types of nerve and muscle fibers.</p> <p><b>2.a.6.List</b> central control of movement and sensations.</p> <p><b>2.a.7.Define</b> electrodiagnostic tests of nerves and muscles.</p>	A. Knowledge and Understanding :
<p><b>b- Intellectual skills:</b></p> <p><b>By the end of the course, students should be able to:</b></p> <p><b>2.b.1.Interpret</b> the balance of body fluids and electrolyte homeostasis.</p> <p><b>2.b.2.Analyze</b> the difference between the types and nature of pain perceived by the patient.</p> <p>.</p> <p><b>2.b.3.Evaluate</b> the patient response to exercise.</p> <p><b>2.b.4.Interpret</b> methods of chronic pain control in different musculoskeletal disorders.</p> <p>.</p>	B. Cognitive Skills:
<p><b>2.c.1.Write</b> the pathway for each type of sensation.</p> <p><b>2.c.2.Use</b> model for gate theory in management plan of patients with musculoskeletal disorders.</p> <p><b>2.c.3.Manage</b> body response to temperature changes.</p> <p><b>2.c.4.Write an</b> algorithm for investigational and therapeutic programs in the management of musculoskeletal disorders.</p>	C. Course-Specific Professional Skills:
<p><b>2.d.1. Use</b> the available information and communication technology effectively in the field of Physiology to conduct researches in Rheumatology, Rehabilitation and Physical Medicine.</p>	D. General Skills:



Topic	Lectures (hrs)	Small group (hrs)	Total (hrs)	% of total	ILOs	1. Course Content:
<b><u>1) MUSCLES AND NERVES</u></b> - Nerve, - Skeletal Muscle.	6	4	10	13%	2.a.1 2.a.6, 2.b.3	
<b><u>2) CENTRAL NERVOUS SYSTEM</u></b> - Neurotransmitters, - Receptors, - Synapses, - Somatic sensations, - Sensory areas of cerebral cortex, - Pain & pain control system, - Spinal cord lesions, - Motor areas of cerebral cortex, - Descending pyramidal & extra-pyramidal tracts., - Stretch reflex & muscle tone, - Basal ganglia, - Cerebellum.	12	8	20	27%	2.a.2, 2.a.3, 2.a.4 2.b.1, 2.b.2 2.b.4 2.c.1, 2.c.2, 2.c.4, 2.d.1	
<b><u>3) CIRCULATION</u></b> - Arterial blood pressure & its regulation, - Capillary circulation, - Edema.	8	5	13	18%	<u>2.a.3,</u> <u>2.a.5,</u>	
<b><u>4) RESPIRATION</u></b> - Hypoxia.	4	1	5	7%	2.a.3, 2.a.5, , 3.c.3, 2.d.1	
<b><u>5) BLOOD</u></b> - Anemia.	4	1	5	7%	2.a.5, 2.b.3	
<b><u>5) METABOLISM</u></b> - Obesity,	5	3	8	9%	<u>2.a.2,</u>	



- Fever - Sports physiology.					<u>2.c.3</u>
<b>6) ENDOCRINE</b> - Thyroid hormones, - Parathyroid hormones, - Calcium homeostasis.	7	3	10	13%	<u>2.a.4,</u> <u>2.a.7,</u> <u>2.b.3</u>
<b>7) KIDNEY</b> - Water & electrolytes balance.	2	2	4	6%	<u>2.b.1</u>
<b>Total</b>	<b>48</b>	<b>27</b>	<b>75</b>	<b>100%</b>	

1. Lectures
2. Tutorials
3. On line lectures : BU-LMS benha university learning management system

Teaching and Learning Methods .7

**Teaching Methods Matrix with Learning Outcomes for the Applied Physiology Course**

Learning methods			Course learning outcomes	
Seminars	Tutorial	Modified Lectures		
■	■	■	2.a.1	Knowledge and Understanding
■		■	2.a.2	
■		■	2.a.3	
■		■	2.a.4	
■		■	2.a.5	
■	■	■	2.a.6	
■		■	2.a.7	
■		■	2.b.1	Cognitive Skills
■		■	2.b.2	
■		■	2.b.3	
■		■	2.b.4	
■	■	■	2.c.1	Professional Skills
■		■	2.c.2	
		■	2.c.3	
		■	2.c.4	
		■	2.d.1	General Skills



Student evaluation.6

3. **Written exams:** Assess knowledge & understanding and intellectual skills.
4. **Structured oral exams:** to assess knowledge and understanding, intellectual, professional and general and transferable skills.

A- Methods used

**Assessment Methods Matrix with Learning Outcomes for the Applied Physiology Course**

Evaluation methods		Course learning outcomes	
Structured Oral Exam	Written exam		
■	■	2.a.1	Knowledge and Understanding
■	■	2.a.2	
■	■	2.a.3	
■	■	2.a.4	
■	■	2.a.5	
■	■	2.a.6	
■	■	2.a.7	
■	■	2.b.1	Cognitive Skills
■	■	2.b.2	
■	■	2.b.3	
■	■	2.b.4	
■		2.c.1	Professional Skills
■		2.c.2	
■		2.c.3	
■		2.c.4	
■		2.d.1	<b>General Skills</b>

- Final exam at May or November

B- Timing

- Examination Marks allocated
- a- Written: 150
- b- Oral: 100
- Total :250

C- Grade Distribution

List of textbooks and references.7

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- Lectures notes

A- Memoirs



<p>-Guyton &amp; Hall Physiology Review 13th Edition</p> <p>Hall, J. E., &amp; Hall, M. E. (2016). Guyton and Hall textbook of medical physiology e-Book. 13th Edition. Elsevier Health Sciences</p> <p>-Ganong's Review of Medical Physiology, Twenty sixth Edition 26th Edition Barrett K., Barman S, Yuan J, et al (2019): Ganong's Review of Medical Physiology, Twenty sixth Edition 26th Edition, McGraw-Hill education.</p>	<p>B- Required books</p>
<p>-Vander's Human Physiology (2019) ;The mechanisms of body functions, 15th Edition Strang, and Arthur J. Vander.(2019): Vander's Human Physiology: The Mechanisms of Body Function. 15th Edition. New York: McGraw-Hill.</p>	<p>C- Suggested books</p>
<ul style="list-style-type: none"> <li>https://join.shawacademy.com/physiology-20-amp?utm_source=google&amp;utm_medium=cpc&amp;utm_campaign=me_search_generic_physiology_courses_bmm&amp;gclid=EAIaIqObChMI6pD8icG07QIVjMLtCh0OfgKEEAA YAyAAEgJIQ_D_BwE</li> </ul>	<p>D- Scientific journals or bulletins</p>

### Course Contents/ILOs Matrix

ILOs Course Contents	2.a. Knowledge and understanding							2.b. . Intellectual Skills				2d.General transferable S
	2.a.1	2.a.2	2.a.3	2.a.4	2.a.5	2.a.6	2.a.7	2.b.1	2.b.2	2.b.3	2.b.4	2.d.1
1-Muscles And Nerves										X		
2-Central Nervous System			X					X				X
3-Circulation			X		X							
4-Respiration			X		X					X		X
5-Blood					X					X		
6-Metabolism			X									
7-Endocrine					X							
8-Kidney	X											

رئيس مجلس القسم العلمي

ا.د/ عبير شومان



**Benha University**  
**Faculty of Medicine**  
**Department of Rheumatology, Rehabilitation, and Physical Medicine**

**Course Description in Rheumatic Diseases, Pharmacological and Surgical Treatment  
 For PhD Students in the Department of Rheumatology, Rehabilitation and Physical Medicine. Updated  
 Regulations**

<b>Course data</b>		
Class/Level: PhD, Part II.	Course Name: Rheumatic Diseases, Drug and Surgical Treatment.	: code RHUM 703
<b>Number of academic units: 20 credit hours 14 theoretical - 6 practical</b>	Specialization: Rheumatology, Rehabilitation, and Physical Medicine.	
<b>Course objective -1</b>		
<ul style="list-style-type: none"> <li>• <b>Provide</b> students with an appropriate background covering rheumatic diseases as regard causes, pathogenesis, diagnosis and management.</li> <li>• <b>Provide</b> students the ability to list differential diagnoses of rheumatic diseases.</li> <li>• <b>Build up</b> the students' skill to organize treatment plans for rheumatic diseases.</li> <li>• <b>Allow</b> them to have the experience for problem solving and decision-making in atypical clinical situations.</li> <li>• <b>Increase</b> the students' trend for evidence-based medicine practice to support up profession in Rheumatology, Rehabilitation and Physical Medicine.</li> <li>• <b>Give</b> students lifelong learning talent necessary for continuous professional development and research establishment.</li> <li>• <b>Provide</b> the students with the professional ethical values essential to demonstrate appropriate attitude towards patients and colleagues.</li> <li>• <b>Allow</b> students to show skills necessary for proper patients' interrogation and evaluation.</li> <li>• <b>Support</b> appropriate professional education necessary for the management and organization of health problems within the community.</li> </ul>		
<b>The objective of teaching the course -2</b>		
<b>By the end of the course, students should be able to:</b>		
<b>2.a.1. List</b> the common causes of arthritis and musculoskeletal disorders (acute and chronic) as well as symptoms and signs of different rheumatic diseases.	A- Information and concepts:	



<p><b>2.a.2. Discuss</b> current and emerging data on the pathogenesis and management of different rheumatic diseases and musculoskeletal disorders,</p> <p><b>2.a.3. list</b> common physical and rheumatic emergencies.</p> <p><b>2.a.4. Discuss</b> essential investigational plans of the immune system, rheumatic and musculoskeletal disorders as integrated with values of proper medical ethics</p> <p><b>2.a.5. Discuss</b> basic data on the mechanisms of action in the immune system</p>	
<p><b>2.b. Intellectual Skills:</b> <b>By the end of the course, students should be able to:</b></p> <p><b>2.b.1. Analyze</b> symptoms and signs of patients and construct differential diagnoses for the different rheumatic diseases.</p> <p><b>2.b.2. Interpret</b> an investigational plan for patients regarding disease presentations and interpret the results of used diagnostic procedures to solve professional problems.</p> <p><b>2.b.3. Evaluate</b> pathogenesis, diagnosis and treatment of different rheumatic diseases.</p> <p><b>2.b.4. Write and present</b> scientific subjects of recent information related to Rheumatology, Rehabilitation and Physical Medicine.</p> <p><b>2.b.5. Classify</b> the indications and rationale of referring patients to other related specialties according to risks and severity.</p> <p><b>2.b.6. Evaluate</b> advance in rehabilitation approaches and management of rheumatic diseases based on recent data, evidence-based medicine and professional vision for future developmental plans</p>	B- Mental skills:
<p><b>2.c.1. use</b> skills to perform intra-articular, soft tissue and botulinum injections.</p> <p><b>2.c.2. Perform</b> and practice up-and-coming challenges in Rheumatology, Rehabilitation and Physical medicine.</p> <p><b>2.c.3. Apply</b> better awareness of current practice and technological means for management of rheumatological emergencies.</p> <p><b>2.c.4. Manage</b> prospects for future developments within Rheumatology, Rehabilitation and Physical Medicine.</p> <p><b>2.c.5. Use</b> specific knowledge and skills of Rheumatology, Rehabilitation and Physical Medicine to other specialties to improve joint communication.</p>	C- Course-specific professional skills:
<p><b>2.d. General and Transferable Skills:</b> <b>By the end of the course, students should be able to:</b></p> <p><b>2.d.1. Communicate</b> effectively with other health care professionals to discuss and exchange ideas and arguments.</p>	D- General skills:



**2.d.2. Use** sources of biomedical information and communication technology to remain up- to-date with advances in knowledge and practice.

**2.d.3. Use** scientific information clearly to others in written, electronic and oral forms to improve performance.

**2.d.4. Show self-assess** of personal learning needs required for continuous professional development.

**2.d.5. Use** the sources of biomedical information and communication technology to teach others and evaluate their clinical practice.

**2.d.6. Communicate** effectively with an interdisciplinary team within time-planned shared programs.

**Course content -2**

Subject	Lectures (hrs)	Clinical & Practical (hrs)	Total (hrs)	% of total	Ilos
1) <b>Structure and Function of Bone, Joints, and Connective Tissue</b>	40	7	47	3%	2.a.2, 2.b.3, 2.b.6, 2.c.1
2) <b>Molecular and Cellular Basis of Immunology and Effector Mechanisms in Autoimmunity and Inflammation</b> Introduction to immune system Innate & adaptive immunity HLA antigen Autoimmunity Immunotolerance APCs and antigen presentation	50	43	93	6%	2.a.5, 2.b.6, 2.c.2, 2.c.4, 2.c.5, 2.d.2, 2.d.3, 2.d.4, 2.d.5, 2.d.6.
3) <b><u>Approach to the Patient with Rheumatic Disease</u></b> <ul style="list-style-type: none"> <li>▪ Physical Examination of the Musculoskeletal System</li> <li>▪ Approach to regional musculoskeletal pain</li> <li>▪ Differential diagnosis of diffuse musculoskeletal pain</li> <li>▪ Evaluation of Monoarticular and Polyarticular Arthritis</li> <li>▪ Pregnancy and Rheumatic Diseases</li> <li>▪ The Eye and Rheumatic Diseases</li> <li>▪ Skin and Rheumatic Diseases</li> </ul>	65	91	156	10%	2.a.1, 2.a.2, 2.a.4, 2.b.1, 2.b.2, 2.b.3, 2.b.4, 2.b.5, 2.b.6, 2.c.1, 2.c.2, 2.c.3, 2.c.4, 2.c.5, 2.d.1, 2.d.2, 2.d.3, 2.d.4, 2.d.5, 2.d.6.



<ul style="list-style-type: none"> <li>▪ Evaluation and Management of Early Undifferentiated Arthritis</li> <li>▪ Nutrition and Rheumatic Diseases</li> </ul>						
4) <b><u>Rheumatoid Arthritis.</u></b>	45	33	78	5%	2.a.1, 2.a.2, 2.a.3, 2.a.4, 2.a.5, 2.b.1, 2.b.2, 2.b.3, 2.b.4, 2.b.5, 2.b.6, 2.c.1, 2.c.2, 2.c.3, 2.c.4, 2.c.5, 2.d.1, 2.d.2, 2.d.3, 2.d.4, 2.d.5, 2.d.6.	
5) <b><u>Spondyloarthropathies</u></b>	45	33	78	5%	2.a.1, 2.a.2, 2.a.3, 2.a.4, 2.a.5, 2.b.1, 2.b.2, 2.b.3, 2.b.4, 2.b.5, 2.b.6, 2.c.1, 2.c.2, 2.c.3, 2.c.4, 2.c.5, 2.d.1, 2.d.2, 2.d.3, 2.d.4, 2.d.5, 2.d.6.	
6) <b><u>Systemic Lupus Erythematosus</u></b>	45	33	78	5%	2.a.1, 2.a.2, 2.a.3, 2.a.4, 2.a.5, 2.b.1, 2.b.2, 2.b.3, 2.b.4, 2.b.5, 2.b.6, 2.c.1, 2.c.2, 2.c.3, 2.c.4, 2.c.5, 2.d.1, 2.d.2, 2.d.3, 2.d.4, 2.d.5, 2.d.6.	
7) <b><u>Scleroderma, Inflammatory Myopathies, And Overlap Syndromes</u></b>	45	33	78	5%	2.a.1, 2.a.2, 2.a.3, 2.a.4, 2.a.5, 2.b.1, 2.b.2, 2.b.3, 2.b.4, 2.b.5, 2.b.6, 2.c.1, 2.c.2, 2.c.3, 2.c.4, 2.c.5, 2.d.1, 2.d.2, 2.d.3, 2.d.4, 2.d.5, 2.d.6.	
8) <b><u>Vasculitides</u></b>	45	33	78	5%	2.a.1, 2.a.2, 2.a.3, 2.a.4, 2.a.5, 2.b.1, 2.b.2, 2.b.3,	



					2.b.4, 2.b.5, 2.b.6, 2.c.2, 2.c.3, 2.c.4, 2.c.5, 2.d.1, 2.d.2, 2.d.3, 2.d.4, 2.d.5, 2.d.6.
<p style="text-align: center;"><b><u>9) Crystal-Induced Arthritis</u></b></p> <ul style="list-style-type: none"> <li>▪ Gout.</li> <li>▪ Calcium Pyrophosphate Deposition Disease</li> </ul>	<b>45</b>	<b>33</b>	<b>78</b>	<b>5%</b>	2.a.1, 2.a.2, 2.a.3, 2.a.4, 2.a.5, 2.b.1, 2.b.2, 2.b.3, 2.b.4, 2.b.5, 2.b.6, 2.c.1, 2.c.2, 2.c.3, 2.c.4, 2.c.5, 2.d.1, 2.d.2, 2.d.3, 2.d.4, 2.d.5, 2.d.6.
<p><b>10) <u>Miscellaneous Rheumatic disorders</u></b></p> <ul style="list-style-type: none"> <li>▪ Familial Autoinflammatory Syndromes</li> <li>▪ Sjögren's Syndrome</li> <li>▪ Adult-Onset Still Disease</li> <li>▪ Anti-phospholipid Syndrome</li> <li>▪ Mixed connective tissue diseases</li> </ul>	<b>45</b>	<b>33</b>	<b>78</b>	<b>5%</b>	2.a.1, 2.a.2, 2.a.3, 2.a.4, 2.a.5, 2.b.1, 2.b.2, 2.b.3, 2.b.4, 2.b.5, 2.b.6, 2.c.1, 2.c.2, 2.c.4, 2.c.5, 2.d.1, 2.d.2, 2.d.3, 2.d.4, 2.d.5, 2.d.6.
<b><u>11) Osteoarthritis</u></b>	<b>45</b>	<b>33</b>	<b>78</b>	<b>5%</b>	2.a.1, 2.a.2, 2.a.4, 2.a.5, 2.b.1, 2.b.2, 2.b.3, 2.b.4, 2.b.5, 2.b.6, 2.c.1, 2.c.2, 2.c.4, 2.c.5, 2.d.1, 2.d.2, 2.d.3, 2.d.4, 2.d.5, 2.d.6.
<p style="text-align: center;"><b><u>12) Cartilage, Bone, And Heritable Connective Tissue Disorders</u></b></p> <ul style="list-style-type: none"> <li>▪ Metabolic Bone Diseases</li> <li>▪ Proliferative bone diseases</li> <li>▪ Osteonecrosis</li> <li>▪ Relapsing Polychondritis</li> <li>▪ Heritable Diseases of Connective Tissue</li> </ul>	<b>45</b>	<b>33</b>	<b>78</b>	<b>5%</b>	2.a.1, 2.a.2, 2.a.4, 2.a.5, 2.b.1, 2.b.2, 2.b.3, 2.b.4, 2.b.5, 2.b.6, 2.c.2, 2.c.4, 2.c.5, 2.d.1, 2.d.2, 2.d.3, 2.d.4, 2.d.5, 2.d.6.
<p style="text-align: center;"><b><u>13) Infectious Arthritis</u></b></p> <ul style="list-style-type: none"> <li>▪ Bacterial Arthritis</li> <li>▪ Lyme Disease</li> </ul>	<b>45</b>	<b>33</b>	<b>78</b>	<b>5%</b>	2.a.1, 2.a.2, 2.a.3, 2.a.4, 2.b.1, 2.b.2, 2.b.3, 2.b.4, 2.b.5, 2.b.6, 2.c.2, 2.c.3,



<ul style="list-style-type: none"> <li>▪ Mycobacterial Infections of Bones and Joints</li> <li>▪ Fungal Infections of Bones and Joints</li> <li>▪ Rheumatic Manifestations of HIV Infection</li> <li>▪ Viral Arthritis</li> <li>▪ Rheumatic Fever and Post-streptococcal Arthritis</li> <li>▪ Rheumatological manifestation of COVID infection</li> </ul>					2.c.4, 2.d.1, 2.d.2, 2.d.3, 2.d.4, 2.d.5, 2.d.6.
<p><b><u>14) Systemic Diseases Associated with Arthritis</u></b></p> <ul style="list-style-type: none"> <li>▪ Rheumatic manifestation of blood disease</li> <li>▪ Arthritis Accompanying Endocrine and Metabolic Disorders</li> <li>▪ Amyloidosis</li> <li>▪ Sarcoidosis</li> <li>▪ Hemochromatosis</li> <li>▪ IgG4-Related Disease</li> <li>▪ Tumors and Tumor-like Lesions of Joints and Related Structures</li> <li>▪ Rheumatic manifestation of malignancy</li> <li>▪ Autoimmune Complications of Immune Checkpoint Inhibitors for Cancer</li> </ul>	45	33	78	5%	2.a.1, 2.a.2, 2.a.3, 2.a.4, 2.a.5, 2.b.1, 2.b.2, 2.b.3, 2.b.4, 2.b.5, 2.b.6, 2.c.1, 2.c.2, 2.c.3, 2.c.4, 2.c.5, 2.d.1, 2.d.2, 2.d.3, 2.d.4, 2.d.5, 2.d.6.
<p><b><u>15) Pediatric Rheumatology</u></b></p> <ul style="list-style-type: none"> <li>▪ Juvenile Idiopathic Arthritis</li> <li>▪ Pediatric Systemic Lupus Erythematosus</li> <li>▪ Juvenile Dermatomyositis, Scleroderma, And Vasculitis</li> <li>▪ Rheumatological manifestation of COVID infection</li> </ul>	50	75	125	8%	2.a.1, 2.a.2, 2.a.3, 2.a.4, 2.a.5, 2.b.1, 2.b.2, 2.b.3, 2.b.4, 2.b.5, 2.b.6, 2.c.1, 2.c.2, 2.c.3, 2.c.4, 2.c.5, 2.d.1, 2.d.2, 2.d.3, 2.d.4, 2.d.5, 2.d.6.



<p><b><u>16) Diagnostic Tests And Procedures In Rheumatic Diseases</u></b></p> <ul style="list-style-type: none"> <li>▪ Acute Phase Reactants and the Concept of Inflammation</li> <li>▪ Complement testing</li> <li>▪ Anti-nuclear Antibodies</li> <li>▪ Extractable Nuclear Antigens.</li> <li>▪ Characteristic autoantibodies associated with SLE</li> <li>▪ Antiphospholipid antibodies</li> <li>▪ Autoantibodies in Rheumatoid Arthritis</li> <li>▪ Autoantibodies in systemic sclerosis</li> <li>▪ Autoantibodies in myositis &amp; necrotizing myopathy</li> <li>▪ ANCA</li> <li>▪ HLA Typing</li> <li>▪ Synovial Fluid Analyses, Synovial Biopsy, and Synovial Pathology</li> <li>▪ Arthrocentesis and Injection of Joints and Soft Tissue</li> </ul>	45	33	78	5%	2.a.1, 2.a.2, 2.a.4, 2.b.2, 2.b.4, 2.b.5, 2.b.6, 2.c.1, 2.c.2, 2.c.4, 2.c.5, 2.d.2, 2.d.3, 2.d.4, 2.d.5, 2.d.6.
<p><b><u>17) Imaging in Rheumatological Diseases.</u></b></p> <ul style="list-style-type: none"> <li>▪ Conventional radiography</li> <li>▪ Computed tomography</li> <li>▪ Magnetic resonance imaging</li> <li>▪ Ultrasonography</li> <li>▪ Other imaging modalities</li> </ul>	45	33	78	5%	2.a.4, 2.b.2, 2.b.4, 2.b.5, 2.b.6, 2.c.2, 2.c.4, 2.c.5, 2.d.2, 2.d.3, 2.d.4, 2.d.5, 2.d.6.
<p><b><u>18) Pharmacology of Anti-rheumatic Drugs</u></b></p> <ul style="list-style-type: none"> <li>▪ Non steroidal anti-inflammatory drugs.</li> <li>▪ Corticosteroids.</li> <li>▪ Urate-Lowering Therapy</li> <li>▪ Immunosuppressive Drugs</li> <li>▪ Bisphosphonates</li> <li>▪ Conventional Disease modifying antirheumatic drugs,</li> <li>▪ Biological therapies.</li> </ul>	50	75	125	8%	2.a.1, 2.a.2, 2.a.3, 2.a.4, 2.a.5, 2.b.3, 2.b.5, 2.b.6, 2.c.1, 2.c.2, 2.c.3, 2.c.4, 2.c.5, 2.d.1, 2.d.2, 2.d.3, 2.d.4, 2.d.5, 2.d.6.



<b>Total</b>	<b>840</b>	<b>720</b>	<b>1560</b>	<b>100%</b>	
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**Teaching and learning methods -3**

1. Lectures
2. Tutorials
3. Practical classes
4. On line lectures : BU-LMS benha university learning management system
- 5.. interactiveZoom meeting, online lectures on Whatsapp group and telegram app
- 6.. Youtube channel containing recorded lectures

**Teaching Methods Matrix with Learning Outcomes for the Rheumatic Diseases, Pharmacological and Surgical Treatment Course**

Learning methods			Course Learning Outcomes	
Seminars	Tutorial	Modified Lectures		
■		■	2.a.1	Knowledge and
	■	■	2.a.2	
■		■	2.a.3	
	■		2.a.4	
		■	2.a.5	
		■	2.b.1	
	■		2.b.2	
■		■	2.b.3	
		■	2.b.4	
		■	2.b.5	
		■	2.b.6	
■	■	■	2.c.1	Professional Skills
		■	2.c.2	



	■		2.c.3	<b>General Skills</b>
		■	2.c.4	
		■	2.c.5	
	■	■	2.d.1	
■			2.d.2	
		■	2.d.3	
■	■	■	2.d.4	
		■	2.d.5	
		■	2.d.6	

-4

Office hours system

Teaching and learning methods for students with limited abilities -5

Student evaluation -6

**Assessment methods matrix with learning outcomes for the course on rheumatic diseases, drug and surgical treatment**

Clinical exam	Evaluation methods		Course Learning	
	Structured Oral Exam	Written exam		
■	■	■	2.a.1	Knowledge and
■	■	■	2.a.2	
■	■	■	2.a.3	
■	■	■	2.a.4	
■	■	■	2.a.5	
■	■	■	2.b.1	
■		■	2.b.2	



■	■	■	2.b.3	Cognitive Skill
■		■	2.b.4	
■	■	■	2.b.5	
■	■	■	2.b.6	
■			2.c.1	General Skill
■			2.c.2	
■			2.c.3	
■			2.c.4	
■			2.c.5	
■	■		2.d.1	
■	■		2.d.2	
■	■		2.d.3	
■	■		2.d.4	
■	■		2.d.5	
■	■		2.d.6	

7-

<ul style="list-style-type: none"> <li>• <b>Written examination:</b> to assess knowledge &amp; intellectual skills.</li> <li>• <b>Oral examination:</b> to assess knowledge, intellectual skills &amp; general &amp; transferable skills.</li> <li>• <b>Clinical exam:</b> assess knowledge, intellectual skills &amp; practical and professional &amp; general &amp; transferable skills.</li> <li>• <b>Practical, plain x-rays to write a report and discuss</b></li> </ul>	A- Methods used
Final exam in May or November	B- Timing
<b>Written Exam 400, commentary 200</b> <b>Oral Exam 100</b> <b>Clinical Exam 200</b> <b>Practical 100</b> <b>Total: 1000</b>	C- Grade distribution



<b>List of textbooks and references: -8</b>	
Lectures notes.	A- Memoirs
<p><b>.1- Essential Books (Text Books):</b></p> <ul style="list-style-type: none"> <li>- Petros Ephthimiou (2020): absolute rheumatology review. First edition. Springer Science &amp; Business Media</li> <li>- Gary Firestein, Ralph Budd, Sherine E Gabriel et al (2021): Kelley and Firestein's Textbook of Rheumatology, 2-Volume Set. 11th Edition. Elsevier</li> <li>- John A. Stone (2021): Current Diagnosis &amp; Treatment in Rheumatology, Fourth Edition. McGraw-Hill Education</li> <li>- Hochberg MC, Gravallese EM, Smolen JS, van der Heijde D, Weinblatt ME, Weisman MH (2022): Rheumatology, 2-Volume Set, 8th Edition. Elsevier Health Sciences.</li> </ul> <p><b>6.2- Recommended Books:</b></p> <ul style="list-style-type: none"> <li>- (2020): Wshington manual of rheumatology third edition . Stephen A. P., Allan G., John F. B. (2010): Manual of rheumatic disease and outpatient orthopedic disorders. 4th edition Little Brown &amp; Co.</li> <li>- Hani Almoallim, Mohamed Cheikh (2021): Skills in Rheumatology. Springer Nature Singapore.</li> <li>- Gustav K. von Schulthess, Juerg Hodler, Rahel A. Kubik-Huch (2021): Musculoskeletal Diseases 2021-2024 Diagnostic Imaging. Springer International Publishing.</li> </ul>	B- Required books
<ul style="list-style-type: none"> <li>• <b>Periodicals:</b> <ul style="list-style-type: none"> <li>- Annals of Rheumatic Diseases.</li> <li>- Arthritis and Rheumatism.</li> <li>- British Journal of Rheumatology.</li> </ul> </li> </ul>	C- Suggested books
<ul style="list-style-type: none"> <li>• <b>Web Sites:</b> <ul style="list-style-type: none"> <li>- www.medscape.com,</li> <li>- www.emedicine.com,</li> <li>- www.gigapedia.com.</li> </ul> </li> </ul>	<b>D - Scientific periodicals or bulletins</b>



## Rheumatology, Rehabilitation and Physical medicine Department

Course name: Rheumatic diseases and drug and surgical treatment

code: RHUM 703

### Course Contents/ILOs Matrix

ILOs  Course Contents	a. Knowledge and understanding					2.b. Intellectual Skill					2.c. Practical & Clinical skills					2.d. General and Transferable Skills:						
	2.a.1	2.a.2	2.a.3	2.a.4	2.a.5	2.b.1	2.b.2	2.b.3	2.b.4	2.b.5	2.b.6	2.c.1	2.c.2	2.c.3	2.c.4	2.c.5	2.d.1	2.d.2	2.d.3	2.d.4	2.d.5	2.d.6
1) Approach to the Patient with Rheumatic Disease	x	x		x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2) Molecular and Cellular Basis of Immunology and Effector Mechanisms in Autoimmunity and Inflammation					x						x		x		x	x		x	x	x	x	x
3) <u>Rheumatoid Arthritis.</u>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
4) <u>Spondyloarthropathies</u>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5) <u>Systemic Lupus Erythematosus</u>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6) <u>Scleroderma, Inflammator</u>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x



<b><u>Y</u> <u>Myopathies,</u> <u>And Overlap</u> <u>Syndromes</u></b>																					
<b>7) <u>Vasculitides</u></b>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<b>8) <u>Crystal-Induced Arthritis</u></b>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<b>9) <u>Miscellaneous Rheumatic disorders</u></b>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<b>10) <u>Osteoarthritis</u></b>	x	x		x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x
<b>11) <u>Cartilage, Bone, And Heritable Connective Tissue Disorders</u></b>	x	x		x	x	x	x	x	x	x		x		x	x	x	x	x	x	x	x
<b>12) <u>Infectious Arthritis</u></b>	x	x	x	x		x	x	x	x		x		x	x	x	x	x	x	x	x	x
<b>13) <u>Systemic Diseases Associated with Arthritis</u></b>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<b>14) <u>Pediatric rheumatology</u></b>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<b>15) <u>Diagnostic Tests And Procedures In Rheumatic Diseases</u></b>	x	x		x		x		x	x	x	x	x		x	x		x	x	x	x	x



<b>16) Imaging in Rheumatological Diseases.</b>				x			x		x	x	x		x		x	x		x	x	x	x	x
<b>17) Pharmacology of Anti-rheumatic Drugs</b>	x	x	x	x	x			x		x	x	x	x	x	x	x	x	x	x	x	x	x

رئيس مجلس القسم  
ا.د. وليد أحمد صلاح الدين

أستاذ المادة  
ا.د. جمال حماد



Benha University  
 Faculty of Medicine  
 Department of Rheumatology, Rehabilitation, and Physical Medicine

**Course Description: Musculoskeletal Diseases, Rehabilitation, Prosthetics, and Orthotics  
 For a PhD in Rheumatology, Rehabilitation, and Physical Medicine (Updated List)**

<b>Course Information</b>		
<b>Year/Level: PhD, Part II</b>	<b>Course Title: Diseases of the Locomotor System, Rehabilitation, Prosthetics, and Orthotics</b>	<b>code : RHUM 704</b>
<b>Number of academic units: 20 credit hours, 11 theoretical and 9 practical</b>	Specialization: PhD in Rheumatology, Rehabilitation and Physical Medicine	
<b>Objective of the course -1</b>		
<ul style="list-style-type: none"> <li>• <i>Provide an appropriate background covering musculoskeletal disorders as regard causes, pathogenesis, diagnosis and management,</i></li> <li>• <i>Give students the ability to list differential diagnoses of musculoskeletal disorders,</i></li> <li>• <i>Create the skill to design rehabilitation programs for musculoskeletal disorders (acute and chronic),</i></li> <li>• <i>Realize expertise for problem solving and decision-making in atypical clinical situations,</i></li> <li>• <i>Develop the trend for evidence-based medicine practice to support up profession in Rheumatology, Rehabilitation and Physical Medicine,</i></li> <li>• <i>Support lifelong learning talent necessary for continuous professional development and research establishment,</i></li> <li>• <i>Present professional ethical values essential to demonstrate appropriate attitude towards patients and colleagues,</i></li> <li>• <i>Prop up communication skills necessary for proper patients' interrogation and evaluation,</i></li> <li>• <i>Sustain appropriate professional education necessary to manage and organize health problems within the community.</i></li> </ul>		
<b>The objective of teaching the course-2</b>		
<b>By the end of the course, students should be able to</b>		



<p><b>2.a.1.</b><i>List</i> current and emerging data on the pathogenesis and management of different musculoskeletal disorders,</p> <p><b>2.a.2.</b><i>Describe</i> the morbidity and mortality of musculoskeletal disorders and discuss an investigational plan for causes and effective modern physiotherapeutic approaches to recover disability,</p> <p><b>2.a.3.</b> <i>Enumerate</i> most recent modalities used in pain control.</p> <p><b>2.a.4.</b><i>List</i> common physical emergencies and illustrate the clinical outcome in the intensive care unit,</p> <p><b>2.a.5.</b> <i>Enumerate</i> recent physical modalities and therapeutic exercises used in rehabilitation programs.</p> <p><b>2.a.6.</b> <i>Discuss</i> rehabilitation program and patients' health outcome through the development and maintenance of a humanized rehabilitation service in the community.</p>	Knowledge and Understanding
<p><b>2.b. Intellectual Skills:</b> <b>By the end of the course, students should be able to:</b></p> <p><b>2.b.1.</b><i>Analyze</i> symptoms and signs of patients and construct differential diagnoses for the different musculoskeletal disorders,</p> <p><b>2.b.2.</b><i>select</i> an investigational plan for patients regarding disease presentations and interpret the results of used diagnostic procedures to solve professional problems,</p> <p><b>2.b.3.</b><i>analyze</i> pathogenesis, diagnosis and treatment of different musculoskeletal disorders,</p> <p><b>2.b.4.</b> <i>Write</i> and present scientific subjects of recent information related to Rheumatology, Rehabilitation and Physical Medicine,</p> <p><b>2.b.5.</b><i>Identify</i> and classify the indications and rationale of referring patients to other related specialties according to risks and severity,</p> <p><b>2.b.6.</b><i>write</i> indications, prescriptions and evaluation of different orthoses and prostheses and estimate their cost benefits in rehabilitation programs,</p>	Cognitive Skills



<p><b>2.b.7. Evaluate</b> rehabilitation approaches and management of rheumatic diseases based on recent data, evidence-based medicine and professional vision for future developmental plans.</p>	
<p><b>2.c.1.Demonstrate</b> skills to perform intra-articular, soft tissue and botulinum injections,</p> <p><b>2.c.2.Prescribe</b> manipulation techniques and therapeutic exercises within the rehabilitation program,</p> <p><b>2.c.3.Categorize, interpret, and write</b> reports of kinesiologic and electromyographic studies,</p> <p><b>2.c.4.write</b> coming challenges in Rheumatology, Rehabilitation and Physical medicine,</p> <p><b>2.c.5.Demonstrate</b> better awareness of current practice and technological means for rehabilitation in emergency cases and critical situations of stroke, acute pain, brain injury, joint infections, spinal injury and sports injury,</p> <p><b>2.c.6.Identify</b> prospects for future developments within Rheumatology, Rehabilitation and Physical Medicine,</p> <p><b>2.c.7.Apply</b> specific knowledge and skills of Rheumatology, Rehabilitation and Physical Medicine to other specialties to improve joint communication,</p>	Professional Skills
<p><b>2.d. General and Transferable Skills:</b> <b>By the end of the course, students should be able to:</b></p> <p><b>2.d.1.Communicate</b> effectively with other health care professionals to discuss and exchange ideas and arguments,</p> <p><b>2.d.2.Use</b> sources of biomedical information and communication technology to remain up- to-date with advances in knowledge and practice,</p>	General Skills



**2.d.3.Retrieve, manipulate** and **present** scientific information clearly to others in written, electronic and oral forms to improve performance,

**2.d.4.Determine** and **self-assess** personal learning needs required for continuous professional development,

**2.d.5.Use** the sources of biomedical information and communication technology to teach others and evaluate their clinical practice,

**2.d.6.Work** effectively with an interdisciplinary team within time-planned shared programs.

### 3-course content

Subject	Lectures (hrs)	Clinical & Practical (hrs)	Total (hrs)	% of total	ILOs
<b>1) Patient Evaluation &amp; Diagnosis</b> <ul style="list-style-type: none"> <li>▪ Neurological history and examination</li> <li>▪ Diagnosis and management of disability</li> <li>▪ Rehabilitation program design</li> <li>▪ Functional Evaluation and Management of Activities of Daily Living</li> </ul>	25	45	70	4%	2.a.1, 2.d.3
<b>2) Diagnostic Procedures</b> <ul style="list-style-type: none"> <li>▪ Laboratory tests and Imaging studies</li> <li>▪ Musculoskeletal and work-related tests</li> <li>▪ Cardiopulmonary assessment /Stress test.</li> <li>▪ Functional assessment instruments</li> <li>▪ Neuropsychological evaluations</li> </ul>	25	45	70	4%	2.b.2, 2.d.2, 2.d.5
<b>3) Therapeutic tools</b> <ul style="list-style-type: none"> <li>▪ Therapeutic Exercise</li> <li>▪ Manipulation, massage and Traction</li> <li>▪ Therapeutic Physical Agents</li> </ul>	25	45	70	4%	2.a.1, 2.a.5, 2.b.4, 2.c.2



<ul style="list-style-type: none"> <li>▪ Behavioral/ Psychological Modalities (relaxation therapy, Biofeed back)</li> </ul>					
<b>4) Electrodiagnosis</b> <ul style="list-style-type: none"> <li>▪ General Electrodiagnosis.</li> <li>▪ Nerve conduction studies.</li> <li>▪ Late responses</li> <li>▪ Electromyography.</li> <li>▪ Evoked potentials.</li> <li>▪ Applied electrodiagnosis.</li> </ul>	74	100	174	10%	2.a.1, 2.b.4, 2.c.3, 2.d.2, 2.d.6
<b>5) Orthotics and Prosthetics</b> <ul style="list-style-type: none"> <li>▪ Gait analysis.</li> <li>▪ Assistive devices</li> <li>▪ Amputation Rehabilitation</li> <li>▪ Upper limb orthoses.</li> <li>▪ Upper limb prostheses.</li> <li>▪ Lower limb orthoses.</li> <li>▪ Lower limb prostheses.</li> <li>▪ Spinal orthoses.</li> <li>▪ Wheelchairs and Seating Systems</li> </ul>	80	129	209	12%	2.a.1, 2.b.3, 2.c.4, 2.c.5, 2.d.2, 2.d.6
<b>6) Management of chronic pain.</b>	13	21	34	2%	2.a.3, 2.a.4, 2.b.4, 2.c.5, 2.d.2, 2.d.3
<b>7) Pharmacologic intervention</b> <ul style="list-style-type: none"> <li>▪ Analgesics.</li> <li>▪ Anti-seizure.</li> <li>▪ Skeletal muscle relaxants.</li> </ul>	14	20	34	2%	2.a.1, 2.a.3, 2.a.5, 2.b.4, 2.c.5, 2.c.6, 2.d.2, 2.d.3
<b>8) Procedural/ Interventional</b> <ul style="list-style-type: none"> <li>▪ Nerve Blocks.</li> <li>▪ Anesthetic Injections.</li> <li>▪ Other Procedural/Interventional.</li> </ul>	24	45	69	4%	2.a.2, 2.a.3, 2.a.5, 2.b.1, 2.b.4, 2.c.1, 2.c.5, 2.c.6, 2.d.2, 2.d.3
<b>9) Neuro-rehabilitation</b> <ul style="list-style-type: none"> <li>▪ Stroke</li> <li>▪ Spinal cord injury</li> <li>▪ Traumatic brain Injury</li> <li>▪ Neuropathies               <ul style="list-style-type: none"> <li>○ Mononeuropathies.</li> <li>○ Polyneuropathies.</li> <li>○ Entrapment Neuropathies.</li> </ul> </li> <li>▪ Neurologic disorders               <ul style="list-style-type: none"> <li>○ Multiple sclerosis.</li> </ul> </li> </ul>	80	129	209	12%	2.a.2, 2.a.5, 2.b.2, 2.b.4, 2.c.4, 2.c.5, 2.c.6, 2.d.1, 2.d.2, 2.d.3, 2.d.6



<ul style="list-style-type: none"> <li>○ Parkinson's disease.</li> <li>○ Ataxias</li> <li>○ Motor neuron disease.</li> <li>○ Poliomyelitis.</li> <li>○ Cerebral palsy.</li> <li>○ Muscular dystrophies.</li> </ul> <ul style="list-style-type: none"> <li>▪ Therapeutic Electrical Stimulation in Neurorehabilitation/Functional Neuromuscular Electrical Stimulation</li> </ul>					
<p><b>10) Musculoskeletal Diseases</b></p> <ul style="list-style-type: none"> <li>▪ Rehabilitation of rheumatological diseases</li> <li>▪ Regional Upper Extremities disorders</li> <li>▪ Regional lower Extremities disorders</li> <li>▪ Spinal disorders</li> <li>▪ Cumulative Trauma Disorders</li> <li>▪ Rehabilitation of osteoporosis</li> <li>▪ Acute trauma and post-care of fracture.</li> </ul>	<b>80</b>	<b>129</b>	<b>209</b>	<b>12%</b>	<p><b>2.a.1, 2.a.2, 2.a.5, 2.b.1, 2.b.2, 2.b.4, 2.c.1, 2.c.4, 2.c.5, 2.c.6, 2.c.7, 2.d.1, 2.d.2, 2.d.3, 2.d.6</b></p>
<p><b>11) Rehabilitation Problems</b></p> <ul style="list-style-type: none"> <li>▪ Spasticity.</li> <li>▪ Deconditioning</li> <li>▪ Pressure Ulcer.</li> <li>▪ Posture/Balance Disorders.</li> <li>▪ Scoliosis.</li> <li>▪ Burns</li> <li>▪ Geriatric rehab</li> <li>▪ Rehabilitation of Patients with Communication Disorders (Aphasia/ Cognitive Communication Disorders/ Motor Speech Disorders (Dysarthria/apraxia)</li> <li>▪ Rehabilitation of Patients with Swallowing Disorders</li> <li>▪ Obesity</li> <li>▪ Voiding Dysfunction</li> <li>▪ Neurogenic bladder.</li> <li>▪ Bowel dysfunction</li> <li>▪ Problems in human sexuality</li> </ul>	<b>80</b>	<b>129</b>	<b>209</b>	<b>12%</b>	<p><b>2.a.1, 2.a.2, 2.a.5, 2.b.2, 2.b.4, 2.c.1, 2.c.2, 2.c.4, 2.c.5, 2.c.6, 2.d.1, 2.d.2, 2.d.3, 2.d.4, 2.d.5, 2.d.6</b></p>



<b>12) Organ-System rehabilitation</b> <ul style="list-style-type: none"> <li>▪ Cardiovascular rehabilitation</li> <li>▪ Peripheral vascular Diseases,</li> <li>▪ Lymphedema,</li> <li>▪ Pulmonary Rehabilitation.</li> <li>▪ rehabilitation of Post COVID infection</li> <li>▪ ICU.</li> <li>▪ Cancer rehabilitation</li> <li>▪ Auditory, vestibular, and visual impairments</li> </ul>	<b>80</b>	<b>129</b>	<b>209</b>	<b>12%</b>	<b>2.a.1, 2.a.2, 2.a.4, 2.a.5, 2.b.2, 2.b.4, 2.c.1, 2.c.2, 2.c.4, 2.c.5, 2.c.6, 2.d.1, 2.d.2, 2.d.3, 2.d.4, 2.d.5, 2.d.6</b>
<b>13) Pediatric Rehabilitation</b> <ul style="list-style-type: none"> <li>▪ Neurological diseases:</li> <li>▪ Assessment of gait and motor function</li> <li>▪ Orthopedic and assistive devices</li> <li>▪ Communication disorders</li> <li>▪ Muscular Disorders</li> <li>▪ Genetic Disorder</li> <li>▪ Neonatal care and related problems</li> <li>▪ Systemic diseases:               <ul style="list-style-type: none"> <li>- Juvenile rheumatoid arthritis</li> <li>- Juvenile systemic lupus</li> <li>- Juvenile dermatomyositis</li> <li>- Hemophilia related musculoskeletal complications</li> </ul> </li> </ul>	<b>30</b>	<b>57</b>	<b>87</b>	<b>5%</b>	<b>2.a.1, 2.a.2, 2.a.5, 2.b.1, 2.b.2, 2.b.4, 2.c.1, 2.c.4, 2.c.5, 2.c.6, 2.c.7, 2.d.1, 2.d.2, 2.d.3, 2.d.4, 2.d.5, 2.d.6</b>
<b>14) Sport medicine</b> <ul style="list-style-type: none"> <li>▪ Sport physiology</li> <li>▪ Tissue injury and healing,</li> <li>▪ Stretching and injury prevention,</li> <li>▪ Different types of sport injuries</li> <li>▪ Rehabilitation of sport injuries</li> </ul>	<b>30</b>	<b>57</b>	<b>87</b>	<b>5%</b>	<b>2.a.1, 2.a.2, 2.a.5, 2.b.1, 2.b.2, 2.b.4, 2.c.1, 2.c.4, 2.c.5, 2.c.6, 2.c.7, 2.d.1, 2.d.2, 2.d.3, 2.d.6</b>
<b>Total</b>	<b>660</b>	<b>1080</b>	<b>1740</b>	<b>100%</b>	

**Teaching and learning methods -4**

1. Lectures
2. Tutorials
3. Practical classes
5. On line lectures : BU-LMS benha university learning management system



6. interactiveZoom meeting, online lectures on Whatsapp group and telegram app
7. Youtube channel containing recorded lectures

**Teaching Methods Matrix with Learning Outcomes for the Musculoskeletal Diseases, Rehabilitation, Prosthetics and Orthotics Course**

Course Learning Outcomes			Course Learning Outcomes	
Seminars	Tutorial			
■		■		Knowledge and Understanding
	■	■		
■		■		
	■			
	■	■		
■		■		
■	■	■		Cognitive Skills
	■			
■	■	■		
	■	■		
	■	■		
		■		
■	■	■		
	■	■		



	■	■		Professional Skills	General skills
	■	■			
		■			
■		■			
	■				
		■			
		■	2.d.2		
		■	2.d.3		
		■	2.d.4		
		■	2.d.5		
	■		2.d.6		

Office hours system

**Teaching and learning 5 methods for students with limited abilities**

**Students evaluation -6**

**Assessment methods matrix with learning outcomes for the course on musculoskeletal disorders, rehabilitation, prosthetics and orthotics**

Evaluation methods			Course Learning Outcomes	
Clinical exam	Structured Oral Exam	Written exam		
■	■	■	2.a.1	
■	■	■	2.a.2	
■	■	■	2.a.3	
■	■	■	2.a.4	
■	■	■	2.a.5	
■	■	■	2.a.6	



■	■		2.b.1		
■		■	2.b.2		
■	■	■	2.b.3		
■		■	2.b.4		
■	■	■	2.b.5		
■	■	■	2.b.6		
■		■	2.b.7		
■			2.c.1		
■			2.c.2		
■			2.c.3		
■			2.c.4		
■			2.c.5		
■			2.c.6		
■			2.c.7		
■	■		2.d.1		
■			2.d.2		
■	■		2.d.3		
■			2.d.4		
■	■		2.d.5		
■			2.d.6		

- Written examination: to assess knowledge & intellectual skills.
- Oral examination: to assess knowledge, intellectual skills & general & transferable skills.
- Clinical exam: assess knowledge, intellectual skills & practical and professional & general & transferable skills.

A- Methods used



<ul style="list-style-type: none"> <li>• <b>Practical</b>, plain x-rays to write a report and discuss</li> </ul>	
Final exam in May or November	B- Timing
<b>Written Exam 400</b> <b>Oral Exam 150</b> <b>Clinical Exam 300</b> <b>Practical 150</b> <b>Total: 1000</b>	C- Grade distribution
<b>List of textbooks and references:7</b>	
Lectures notes.	A- Memoirs
<ul style="list-style-type: none"> <li>– Frontera, W. R., Silver, J. K., &amp; Rizzo, T. D. (2015). Essentials of physical medicine and rehabilitation: Musculoskeletal disorders, pain, and rehabilitation.3<sup>rd</sup> edition. Philadelphia, PA: Saunders/Elsevier.</li> <li>– J. C. Tan (2006): Practical manual of physical medicine and rehabilitation. Elsevier Health Sciences.</li> <li>– Frank H. Krusen, Frederic J. Kottke, Justus F. Lehmann (2010):Krusen's textbook of Physical medicine&amp; Rehabilitation. Saunders</li> <li>– Ian B. Maitin, Ernesto Cruz (2015): Current Diagnosis &amp; Treatment: Physical medicine &amp; rehabilitation. McGraw-Hill Education</li> <li>– Secrets of Rehabilitation and Physical medicine fourth edition (2023)</li> </ul> Braddon Physical medicine and rehabilitation six th Edition (2020)	B- Required books
<ul style="list-style-type: none"> <li>- Frontera, W. R., &amp; DeLisa, J. A. (2019). DeLisa's Physical medicine &amp; rehabilitation: Principles and practice. Sixth edition. Philadelphia: Lippincott Williams &amp; Wilkins Health.</li> </ul>	C- Suggested books
<ul style="list-style-type: none"> <li>- Archives of Physical Medicine and Rehabilitation Journal.</li> <li>• Journal of the Egyptian society of rheumatology and Rehabilitation.</li> <li>• <b>Web Sites:</b> <ul style="list-style-type: none"> <li>- www.medscape.com,</li> <li>- www.emedicine.com,</li> <li>- www.gigapedia.com.</li> </ul> </li> </ul>	<b>D - Scientific periodicals or bulletins</b>



### Course Contents/ILOs Matrix

ILOs  Course Content	2.a. Knowledge understanding					2.b. Intellectual skills				2.c. Practical & Clinical skills							2d.General and transferable Skills						
	2.a.1	2.a.2	2.a.3	2.a.4	2.a.5	2.b.1	2.b.2	2.b.3	2.b.4	2.c.1	2.c.2	2.c.3	2.c.4	2.c.5	2.c.6	2.c.7	2.d.1	2.d.2	2.d.3	2.d.4	2.d.5	2.d.6	
1- Patient Evaluation	x																		x				
2- Diagnostic Procedures							x											x				x	
3- Therapeutic tools	x				x				x	x													
4- Electro-diagnosis	x								x		x							x					x
5-Orthotics and Prosthetics	x							x				x	x					x					x
6-Management of chronic pain			x	x					x					x				x	x				
7- Pharmacologic intervention	x		x						x					x	x			x	x				
8) Procedural/ Interventional		x	x		x	x			x	x				x	x			x	x				
9) Neuro-rehabilitation		x			x		x		x					x	x		x	x	x				x
10) Musculoskeletal Diseases	x	x			x	x	x		x	x			x	x	x	x		x	x	x			x
11) Rehabilitation Problems	x	x			x		x		x	x	x		x	x	x		x	x	x	x	x	x	x
12) Organ-System rehabilitation	x	x		x	x		x		x	x	x		x	x	x		x	x	x	x	x	x	x
13 Pediatric Rehabilitation	x	x			x	x	x		x	x			x	x	x	x		x	x	x	x	x	x



14) Sport medicine	x	x			x	x	x			x	x			x	x	x				x
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رئيس مجلس القسم  
اد. وليد أحمد صلاح الدين

أستاذ المادة  
اد. جمال حماد



## 7- Student Assessment strategies/methods to verify and ensure students' acquisition of Program Outcomes:

Targeted learning outcomes	The method	م
To assess knowledge & intellectual skills. 2.a.1. → 2.a.8, 2.b.1. → 2.b.7.	Written examination	1
To assess knowledge, intellectual skills & General & transferable skills. 2.a.1. → 2.a.8, 2.b.1. → 2.b.7, 2.d.1. → 2.d.6.	Oral examination	2
To assess knowledge, intellectual skills, professional General & transferable skills. 2.a.1. → 2.a.8, 2.b.1. → 2.b.7, 2.c.1. → 2.c.7, 2.d.1. → 2.d.6.	Practical examination	3
To assess knowledge & understanding, intellectual skills, practical & clinical skills and general & transferable skills. 2.a.1. → 2.a.8, 2.b.1. → 2.b.7, 2.c.1. → 2.c.7, 2.d.1. → 2.d.6.	Thesis discussion	4

### First part

Total	Score		Test	The course
	oral	written		
250	100	150	3-hour written exam + oral exam.	Anatomy
250	100	150	3-hour written exam + oral exam.	Physiology
500				Total

### Second part

total	Score				Test	Course
	practical	clinical	oral	written		
1000	100	200	100	200+400	3-hour written exam + clinical exam + practical exam + oral exam + 1.5-hour written case exam	Rheumatology
1000	150	300	150	400	3-hour written exam in other musculoskeletal diseases, physical medicine and rehabilitation,	musculoskeletal diseases, physical medicine and



					prosthetics and orthotics + practical + oral + clinical exam	<b>rehabilitation, prosthetics and orthotics</b>
<b>2000</b>						<b>Total</b>

**Third part: Thesis:** Pass or fail according to the committee decision and approved by department council, Faculty council and University council.

## 8- Evaluation of Program:

Evaluator	Tools	sample
Internal evaluators	Report	1-2 Report
External Evaluators	Report	1-2 Report
Senior students	Interview, questionnaires	all
Alumni	Interview, questionnaires	Not less than 50% from the last 3 years
Stakeholders	Interview, questionnaires	Representative samples from all sectors

## 9- Teaching and Learning strategies/methods to achieve Program Outcomes:

- 1-Interactive learning
- 2-Outcome based learning
- 3-Case based learning
- 4-E-learning

**Program Coordinator:**

**Name: Prof. Dr. Gamal Hamad**

**Date: October 2024**

**Signature:**