# بسم In the Name of God

**Hamadan University of Medical Sciences and Health Services**
**Educational Deputy of the University**
**Center for Studies and Development of Medical Sciences Education**

# Theory/Practical Lesson Plan Form

**Dear Colleagues,**

As the teaching-learning process is one that requires careful planning to achieve its objectives, the preparation of a lesson plan at the beginning of the educational process (as a map and guide for instructors and students) is essential. It serves as one of the main tools for the educational activities of instructors. Therefore, we kindly ask all instructors to pay utmost attention to completing the lesson plan.

## Course and Instructor Details (Completing all items in this section is essential)

| Field | Details |
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| **Course title** | Anatomy of the Cardiovascular System |
| **Instructors** | Dr. Iraj Amiri; Dr. Abbas Bakhtiari; Dr. Sepideh Gohari Taban |
| **Course coordinator (responsible)** | Dr. Abbas Bakhtiari |
| **Head of Department** | Dr. Maryam Bahmanzadeh |
| **Units (credits)** | Theory: 1.0 unit (8 sessions); Practical: 0.5 unit (8 sessions) |

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| **Program & student level** | Basic Medical Sciences — Doctor of Medicine (General Medicine) |
| **Semester** | First semester |
| **Teaching location** | Faculty of Medicine, Hamadan University of Medical Sciences |

Theoretical component — Anatomy of the Cardiovascular System

| Session | Topic | Learning outcomes (behavioral) | Learning domain | Teaching methods | Duration | Teaching aids | Evaluation methods |
|---|---|---|---|---|---|---|---|
| **1** | Overview of the cardiovascular system and osteology of the thorax | 1. Name components and functions of the cardiovascular system. 2. Describe bones forming the thoracic cage. 3. Explain rib counting and intercostal spaces. 4. Describe joints of the thorax. 5. List disorders of the thoracic wall bones. | Knowledge | Lecture; Group discussion | 120 minutes | PowerPoint; whiteboard | Q&A |
| **2** | Soft tissues and muscles of the thoracic wall | 1. Name muscles of the thoracic wall. 2. Describe the diaphragm and its importance. 3. Explain | Knowledge | Lecture; Group discussion | 120 minutes | PowerPoint; whiteboard | Quiz; Q&A |

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| | | functions of thoracic wall muscles. | | | | | |
| **3** | Vessels and nerves of the thoracic wall; breast anatomy | 1. Describe blood supply of thoracic wall. 2. Describe innervation of thoracic wall. 3. Explain lymphatic drainage of the thorax. 4. Describe structure of the breast. | Knowledge | Lecture; Group discussion | 120 minutes | PowerPoint; whiteboard | Quiz; Q&A |
| **4** | Region of the mediastinum | 1. Describe the boundaries of the mediastinum. 2. State the subdivisions of the mediastinum. 3. List mediastinal contents. | Knowledge | Lecture; Group discussion | 120 minutes | PowerPoint; whiteboard | Quiz; Q&A |
| **5** | Anatomy of the heart and great vessels; pericardium | 1. Name surfaces and borders of the heart. 2. Describe cardiac chambers. 3. Describe cardiac blood supply and innervation. 4. Identify cardiac borders on | Knowledge | Lecture; Group discussion | 120 minutes | PowerPoint; whiteboard | Quiz; Q&A |

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| | | the thoracic wall. 5. Localize auscultation points of the heart valves. 6. Describe great vessels connected to the heart. 7. Explain the pericardium and its clinical importance. | | | | | |
| **6** | Histology of the heart and blood vessels | 1. Describe the layers of the heart. 2. Describe layers of blood vessels. 3. Identify the epithelium of cardiac and vascular structures. 4. Differentiate histological features of different vessel types. | Knowledge | Lecture; Group discussion | 120 minutes | PowerPoint; whiteboard | Quiz; Q&A |
| **(Alternate)** | Histology of the lymphatic and immune systems | 1. Describe histology of lymphatic structures. 2. Explain functions of the | Knowledge | Lecture; Group discussion | 120 minutes | PowerPoint; whiteboard | Quiz; Q&A |

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| | | lymphatic system. 3. Name organs of the lymphatic system. 4. Describe mechanisms of immune responses. | | | | | |
| 7 | Cardiac and vascular development (arterial development) and fetal circulation | 1. Explain origin and formation of the heart-forming region. 2. Describe development of cardiac walls, chambers and conduction system. 3. Describe development of the body arteries. 4. Explain development of the aortic arches. 5. Name molecular factors involved in cardiovacular development. 6. Describe fetal circulation. 7. List | Knowledge | Lecture; Group discussion | 120 minutes | PowerPoint; whiteboard | Quiz; Q&A |

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| | | congenital developmental disorders of the heart and arteries. | | | | | |
| **8** | Continued vascular development (venous system), lymphatic system development, and congenital anomalies of the heart and vessels | 1. Describe development of systemic veins. 2. Describe development of the lymphatic system and lymphatic vessels. 3. Identify developmental anomalies of veins and lymphatic vessels. | Knowledge | Lecture; Group discussion | 120 minutes | PowerPoint; whiteboard | Quiz; Q&A |

Practical component — Anatomy of the Cardiovascular System (0.5 unit — 8 sessions)

| **Session** | **Topic** | **Learning outcomes (behavioral)** | **Learning domain** | **Teaching methods** | **Duration** | **Teaching aids** | **Evaluation methods** |
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| **1** | Osteology of the thoracic wall (models & cadaver) | 1. Identify ribs 1–12 on models and cadaver. 2. Demonstrate the sternum and its parts. 3. Identify thoracic joints and ligaments. 4. Palpate and number ribs on self | Application | Observation; Demonstration; Group Q&A; Multimedia | 120 minutes | Rib/sternum/vertebrae models; natural rib/vertebrae specimens; cadaver; full skeleton model; dissection simulator; posters; radiology images; educational software | Class activity; Quiz; Q&A; Attendance; Assignment (clinical question research) |

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| | | or peer. 5. Describe features of vertebrae, especially thoracic vertebrae and intervertebral discs. | | | | | |
| **2** | Muscles, vessels and nerves of the thoracic wall | 1. Identify external thoracic muscles on models/cadaver. 2. Identify internal thoracic muscles on models/cadaver. 3. Identify intercostal muscles, vessels and nerves. 4. Locate long thoracic nerve on cadaver. 5. Identify internal thoracic artery & vein on cadaver. | Application | Observation; Demonstration; Group Q&A; Multimedia | 120 minutes | Torso and muscle models; thoracic muscle models; cadaveric thoracic wall; dissection assistant; posters; radiology images; educational software | Class activity; Quiz; Q&A; Attendance; Assignment |
| **3** | Mediastinum — practical identification | 1. Demonstrate mediastinal boundaries on model/cadaver. 2. Demonstrate mediastinal subdivisions on | Application | Observation; Demonstration; Group Q&A; Multimedia | 120 minutes | Torso model; mediastinum model; cadaveric mediastinum; dissection assistant; bronchial/ lung posters; radiology/CT/ MRI images; educational software | Class activity; Quiz; Q&A; Attendance; Assignment |

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| | | model/cadaver. 3. Identify mediastinal contents from anterior→posterior or superior→inferior on model/cadaver. | | | | | |
| **4** | External morphology of the heart | 1. Identify cardiac surfaces and borders. 2. Localize heart position on body, model and cadaver. 3. Show cardiac relations on model and cadaver. 4. Identify coronary vessels and grooves. 5. Demonstrate pericardial layers and cavity on cadaver. | Application | Observation; Demonstration; Group Q&A; Multimedia | 120 minutes | Heart and torso models; dissected cadaveric heart; dissection assistant; cardiac posters; radiology images; educational software | Class activity; Station/practical exam; Q&A; Attendance; Assignment |
| **5** | Cardiac chambers (internal anatomy) | 1. Identify cardiac chambers (atria and ventricles) on model/cadaver. 2. Identify fossa ovalis, AV valves, semilunar valves on model/cada | Application | Observation; Demonstration; Group Q&A; Multimedia | 120 minutes | Cardiac chamber models; dissected cadaveric heart; dissection assistant; chamber posters; radiology images; educational software | Class activity; Quiz; Q&A; Attendance; Assignment |

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| | | ver. 3. Demonstrate chordae tendineae, valve leaflets and papillary muscles. 4. Identify pectinate muscles in the atria on model/cadaver. 5. Identify interventricular septum and conduction-related septal structures. | | | | | |
| **6** | Cardiac histology (microscopic structure) | 1. Identify microscopic structure of cardiac muscle in longitudinal and cross sections. 2. Identify intercalated discs microscopically. 3. Identify Purkinje fibers microscopically. 4. Recognize histological layers of the heart. | Application | Observation; Demonstration; Group Q&A; Live microscope projection; Educational film (e.g., Ackland) | 120 minutes | Cardiac histology slides; microscopes; monitor/TV; multihead microscope; whiteboard markers | Class activity; Quiz; Q&A; Attendance; Assignment |
| **7** | Histology of blood vessels | 1. Identify microscopic structure of capillaries, muscular arteries, | Application / Understanding | Observation; Demonstration; Group Q&A; | 120 minutes | Vascular histology slides; microscopes; monitor; multihead | Class activity; Station/practical exam; Q&A; |

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| | | elastic arteries and veins. 2. Differentiate vessel types histologically. 3. Identify vessel epithelium. | | Live microscope projection; Educational film | | microscope; whiteboard markers; educational software | Attendance; Assignment; Drawing and labeling observed structures |
| **8** | Histology of lymphatic system structures | 1. Identify microscopic structure of lymphoid tissues (tonsil, lymph node, thymus, spleen). 2. Differentiate lymphoid organs histologically. | Application | Observation; Demonstration; Group Q&A; Live microscope projection; Educational film | 120 minutes | Lymph node, thymus, tonsil, spleen slides; microscopes; monitor; multihead microscope; whiteboard markers | Class activity; Station/practical exam; Q&A; Attendance; Assignment; Drawing and labeling observed structures |

Grading scheme — Theory (Total 20 points)

| Assessment type | Assessment tool | Points (out of 20) |
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| **Quiz** | Multiple-choice & short-answer written questions | 0.5 |
| **Project presentation** | Presentation quality, mastery of topic, responses to questions | 0.5 |
| **Final exam (end-term)** | Multiple-choice, descriptive and short-answer written questions | 18 |
| **Other activities** | Class participation, answering instructor questions, interest and follow-up, full attendance | 1 |
| **Total** | — | 20 |

Grading scheme — Practical (Total 20 points)

| Assessment type | Assessment tool | Points (out of 20) |
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| **Quiz** | Short-answer written questions | 1 |
| **Attendance** | Attendance list | 1 |
| **Final practical exam** | Oral questions | 18 |
| **Total** | — | 20 |