

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

| Module Information                 |                        |                               |                                                                                                                                                                                                                                                                           |
|------------------------------------|------------------------|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية            |                        |                               |                                                                                                                                                                                                                                                                           |
| Module Title                       | <b>Physiology II</b>   |                               | Module Delivery                                                                                                                                                                                                                                                           |
| Module Type                        | Core                   |                               | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input checked="" type="checkbox"/> Lab<br><input checked="" type="checkbox"/> Tutorial<br><input checked="" type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | <b>MDER323</b>         |                               |                                                                                                                                                                                                                                                                           |
| ECTS Credits                       | 5                      |                               |                                                                                                                                                                                                                                                                           |
| SWL (hr/sem)                       | <b>125</b>             |                               |                                                                                                                                                                                                                                                                           |
| Module Level                       | 3                      | Semester of Delivery          |                                                                                                                                                                                                                                                                           |
| Administering Department           | Biomedical Engineering | College                       | College of engineering                                                                                                                                                                                                                                                    |
| Module Leader                      | MSc. Hayder Raad       | e-mail                        | Haider.RaadAbbas@alayen.edu.iq                                                                                                                                                                                                                                            |
| Module Leader's Acad. Title        | M.SC                   | Module Leader's Qualification | M.SC                                                                                                                                                                                                                                                                      |
| Module Tutor                       | Eng Fatima Hamoud      | e-mail                        | Fatima7Hamoud@hmail.com                                                                                                                                                                                                                                                   |
| Peer Reviewer Name                 | Name                   | e-mail                        | E-mail                                                                                                                                                                                                                                                                    |
| Scientific Committee Approval Date |                        | Version Number                |                                                                                                                                                                                                                                                                           |

| Relation with other Modules       |                        |          |                               |
|-----------------------------------|------------------------|----------|-------------------------------|
| العلاقة مع المواد الدراسية الأخرى |                        |          |                               |
| Prerequisite module               | Biochemistry + Anatomy | Semester | first year + 2nd and 3rd year |
| Co-requisites module              | None                   | Semester |                               |

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

|                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Module Aims</b></p> <p>أهداف المادة الدراسية</p>                      | <p>To get a practical skill, and developing professional capabilities of students. To learn how to diagnose some physiological problem. To learn basic concepts of physiological subjects which is related with devices and instrument. To understand physiology of blood (part 2). To know about physiology of some organ like kidneys. To learn about acidity and alkalinity of blood. To understand the physiology of hormones. To understand the physiology of Circulatory system.</p> |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p> | <p>Knowledge</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <p>A2</p> | <p>A2-1: <b>Outline</b> the fundamental concepts of renal physiology (nephron structure, GFR), acid–base balance, hormonal physiology, and cardiovascular system components including heart structure and circulation pathways.</p> <p>A2-2: <b>Explain</b> the physiological mechanisms underlying kidney function (filtration and regulation), acid–base homeostasis, hormone actions, cardiac electrophysiology, and blood circulation dynamics.</p> <p>A2-3: <b>Apply</b> physiological principles to interpret functional relationships such as cardiac output regulation, heart rate effects, stroke volume, venous return, and electrocardiogram (ECG) analysis.</p> <p>A2-4 <b>Analyze</b> physiological interactions between renal, cardiovascular, and endocrine systems, including the regulation of fluid balance, blood pressure, and acid–base homeostasis.</p> |
|                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <p>A3</p> | <p>A3-1: <b>Identify</b> key physiological parameters and structures in laboratory settings, including nephron components, ECG waves, heart regions, and circulatory pathways.</p> <p>A3-2: <b>Distinguish</b> between normal and altered physiological responses in experiments, such as variations in GFR, acid–base balance, hormone effects, and cardiac electrical activity.</p> <p>A3-3 <b>Conduct</b> basic physiological measurements and analyses, including ECG interpretation, estimation of cardiac output, and evaluation of factors affecting heart function and body homeostasis.</p>                                                                                                                                                                                                                                                                          |





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|                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |    | A3-4 <b>Differentiate</b> between normal and abnormal physiological measurements in renal, cardiovascular, and endocrine functions based on laboratory and clinical data.                                                |
|                                                   | Skills                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | B1 | B1.1 Function efficiently as an individual Perform anatomical dissections and identify structures efficiently as an individual.<br>B1.2 Function as a member of a team during laboratory sessions and clinical seminars. |
|                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | B2 | B2.1 Communicate effectively – graphically with a range of audiences using contemporary tools.<br>B2.2 Communicate verbally and in writing with a range of audiences using contemporary tools.                           |
|                                                   | Ethics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | C2 | C1-1: Commit to quality standards.<br>C1-2: Adhere to deadlines.<br>C1-3: Strive for continuous improvement.                                                                                                             |
| <b>Indicative Contents</b><br>المحتويات الإرشادية | Indicative content includes the following:-<br>1- Blood (part 2) [6 hrs.]<br>2- Kidney (Physiology and functions, nephron, GFR. [6 hrs.]<br>3- Acid – base balance in human body. [8 hrs.]<br>4- Physiology of hormones Definition, functions, compositions [6 hrs.]<br>5- PHYSIOLOGY OF Circulatory system, The Heart, Systemic and pulmonary circulation, Cardiac muscle action potential, Conductive system, Excitation and Conduction , Cardiac cycle, Pacemaker potential, Contraction of cardiac muscle, Cardiac output, Measurement of cardiac output<br>The effect of heart rate on cardiac output contractility, End diastolic volume Stroke volume, Venous return, regulation of cardiac output, Principle of ECG<br>ECG waves, Limb leads , Chest leads , Cardiac axis [49 hrs.] |    |                                                                                                                                                                                                                          |

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                |
|------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | Assessment is based on hand-in assignments, written exam, Case study, Quizzes, seminars, Practical testing and Online testing. |



| Student Workload (SWL)<br>الحمل الدراسي للطالب                                 |     |                                                                            |      |
|--------------------------------------------------------------------------------|-----|----------------------------------------------------------------------------|------|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 78  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعياً       | 1.6  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 47  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعياً | 2.65 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 125 |                                                                            |      |

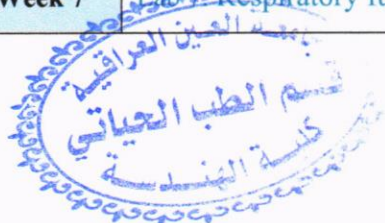
| Module Evaluation<br>تقييم المادة الدراسية |                 |             |                  |                 |                           |
|--------------------------------------------|-----------------|-------------|------------------|-----------------|---------------------------|
|                                            |                 | Time/Number | Weight (Marks)   | Week Due        | Relevant Learning Outcome |
| Formative assessment                       | Quizzes         | 5           | 10% (10)         | 4,6,8,10 and 12 | A2-2 A2-3 A3-2            |
|                                            | Assignments     | 0           | 10% (10)         | -               | ALL                       |
|                                            | Projects / Lab. | 1           | 10% (10)         | Continuous      | A3 A2                     |
|                                            | Report          | 1           | 10% (10)         | 13              | A2-3 A3-2                 |
| Summative assessment                       | Midterm Exam    | 3 hr        | 10% (10)         | 7               | A2 A3                     |
|                                            | Final Exam      | 3hr         | 50% (50)         | 16              | All                       |
| Total assessment                           |                 |             | 100% (100 Marks) |                 |                           |

| Delivery Plan (Weekly Syllabus)<br>المنهاج الأسبوعي النظري |                                                                       |                        |
|------------------------------------------------------------|-----------------------------------------------------------------------|------------------------|
|                                                            | Material Covered                                                      | LOs                    |
| Week 1                                                     | Kidney (Physiology and functions)                                     | A2-1, B1.1, C1-1       |
| Week 2                                                     | Kidney (nephron, GFR).                                                | A2-2, B2.1, C1-3       |
| Week 3                                                     | Acid – base balance in human body. (Part 1)                           | A3-3, A3-2, C1-1       |
| Week 4                                                     | Acid – base balance in human body. (Part 2)                           | A2-2, A3-1             |
| Week 5                                                     | Physiology of hormones (Definition, functions, compositions) (Part 1) | A2-3 A3-2 B2-2<br>C1-1 |
| Week 6                                                     | Physiology of hormones (Part 2)                                       | A2-1, A2-3, A3-2, B2.2 |
| Week 7                                                     | PHYSIOLOGY OF Circulatory system. The Heart                           | A2-4, A3-4, C1-2       |



|                |                                                                                    |                              |
|----------------|------------------------------------------------------------------------------------|------------------------------|
| <b>Week 8</b>  | Systemic and pulmonary circulation                                                 | A2-1, A3-1                   |
| <b>Week 9</b>  | Cardiac muscle action potential                                                    | A2-2, B2.2, C1-3             |
| <b>Week 10</b> | Conductive system, Excitation and Conduction                                       | A2-2, B2.1, C1-1             |
| <b>Week 11</b> | Cardiac cycle, Pacemaker potential                                                 | A2,A3                        |
| <b>Week 12</b> | Contraction of cardiac muscle, Cardiac output, Measurement of cardiac output       | A2-4, A2-3, A3-2, B1.2, C1-3 |
| <b>Week 13</b> | The effect of heart rate on cardiac output contractility                           | A2-2, A3-2, B1.1             |
| <b>Week 14</b> | End diastolic volume<br>Stroke volume, Venous return, regulation of cardiac output | A3-4, A3-2, C1-2             |
| <b>Week 15</b> | Principle of ECG<br>ECG waves, Limb leads , Chest leads , Cardiac axis             | A2, A3                       |
| <b>Week 16</b> | <b>General Review</b>                                                              |                              |

| <b>Delivery Plan (Weekly Lab. Syllabus)</b><br>المنهاج الاسبوعي للمختبر |                                      |            |
|-------------------------------------------------------------------------|--------------------------------------|------------|
|                                                                         | <b>Material Covered</b>              | <b>LOs</b> |
| <b>Week 1</b>                                                           | Lab 1: The capillary resistance test | A3         |
| <b>Week 2</b>                                                           | Lab 2: The bleeding time             | A3         |
| <b>Week 3</b>                                                           | Lab 3: The coagulation time          | A3         |
| <b>Week 4</b>                                                           | Lab 4: hormonal measurement          | A3         |
| <b>Week 5</b>                                                           | Lab 5: ECG                           | A3         |
| <b>Week 6</b>                                                           | Lab 6: Blood pressure measurement    | A3         |
| <b>Week 7</b>                                                           | Lab 7: Respiratory function          | A3         |



| Learning and Teaching Resources |                                                                                                         |                           |
|---------------------------------|---------------------------------------------------------------------------------------------------------|---------------------------|
| مصادر التعلم والتدريس           |                                                                                                         |                           |
|                                 | Text                                                                                                    | Available in the Library? |
| Required Texts                  | Principles of anatomy and physiology, by Gerard J. Tortora & Bryan H. Derrickson 12th ed. Volume 1 2009 | Yes                       |
| Recommended Texts               | Text book of medical physiology, by Guyton & Hall . eleven ed. 2020.                                    | No                        |
| Websites                        | <a href="https://eng.alayen.edu.iq//colleges/e/42">https://eng.alayen.edu.iq//colleges/e/42</a>         |                           |

| Grading Scheme                                                                                                                                                                                                                                                                                                                                                                       |                  |                     |           |                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------------|-----------|---------------------------------------|
| مخطط الدرجات                                                                                                                                                                                                                                                                                                                                                                         |                  |                     |           |                                       |
| Group                                                                                                                                                                                                                                                                                                                                                                                | Grade            | التقدير             | Marks (%) | Definition                            |
| Success Group<br>(50 - 100)                                                                                                                                                                                                                                                                                                                                                          | A - Excellent    | امتياز              | 90 - 100  | Outstanding Performance               |
|                                                                                                                                                                                                                                                                                                                                                                                      | B - Very Good    | جيد جدا             | 80 - 89   | Above average with some errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | C - Good         | جيد                 | 70 - 79   | Sound work with notable errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | D - Satisfactory | متوسط               | 60 - 69   | Fair but with major shortcomings      |
|                                                                                                                                                                                                                                                                                                                                                                                      | E - Sufficient   | مقبول               | 50 - 59   | Work meets minimum criteria           |
| Fail Group<br>(0 - 49)                                                                                                                                                                                                                                                                                                                                                               | FX – Fail        | راسب (قيد المعالجة) | (45-49)   | More work required but credit awarded |
|                                                                                                                                                                                                                                                                                                                                                                                      | F – Fail         | راسب                | (0-44)    | Considerable amount of work required  |
|                                                                                                                                                                                                                                                                                                                                                                                      |                  |                     |           |                                       |
| <b>Note:</b> Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above. |                  |                     |           |                                       |

