|  |  |
| --- | --- |
| **Course Title:** | **Physiology I** |
| **Course Code:** | **Phys 223** |
| **Program:** | **Bachelor of Pharmaceutical Sciences (B.Pharm.SC)** |
| **Department:** | **-** |
| **College:** | **Pharmacy** |
| **Institution:** | **Najran University** |

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# A. Course Identification

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1. Credit hours:** | | | | **3 (2+1)** | | | | | | | | | | | | |
| **2. Course type** | | | | | | | | | | | | | | | | |
| **a.** | University | |  | | College | | | **√** | Department | | | |  | Others |  |  |
| **b.** | | Required | | | | **√** | Elective | | |  |  | | | | | |
| **3. Level/year at which this course is offered:** | | | | | | | | | | | | **level 3 (1st semester) – 2nd year** | | | | |
| **4. Pre-requisites for this course** (if any)**:**  **None** | | | | | | | | | | | | | | | | |
| **5. Co-requisites for this course** (if any)**:** | | | | | | | | | | | | | | | | |
| **None** | | | | | | | | | | | | | | | | |

## 6. Mode of Instruction (mark all that apply)

| **No** | **Mode of Instruction** | **Contact Hours** | **Percentage** |
| --- | --- | --- | --- |
| **1** | **Traditional classroom** | 30 | 50 % |
| **2** | **Blended** | - | - |
| **3** | **E-learning** | - | - |
| **4** | **Correspondence** | - | - |
| **5** | **Other** | 30 | 50 % |

**7. Actual Learning Hours** (based on academic semester)

|  |  |  |
| --- | --- | --- |
| **No** | **Activity** | **Learning Hours** |
| **Contact Hours** | | |
| **1** | **Lecture** | 30 |
| **2** | **Laboratory/Studio** | 30 |
| **3** | **Tutorial** | 0 |
| **4** | **Others** (specify) | 0 |
|  | **Total** | 60 |
| **Other Learning Hours\*** | | |
| **1** | **Study** | 60 |
| **2** | **Assignments** | 0 |
| **3** | **Library** | 0 |
| **4** | **Projects/Research Essays/Theses** | 0 |
| **5** | **Others**(specify) | 0 |
|  | **Total** | 60 |

**\***The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

# B. Course Objectives and Learning Outcomes

|  |
| --- |
| 1. Course Description Physiology I course primarily focuses on basic facts in human physiology tailored for pharmacy students which include: organization of human body; body fluids compartments; autonomic nervous system; blood components and their functions; and functions of the cardiovascular and respiratory systems. Physiology of other body systems will be covered in semester two. This course is delivered in form of interactive lectures using power point presentation and short videos in addition to the practical sessions. |
|  |
| 2. Course Main Objective |
| By the end of this course, the student should be able to:   1. Describe different levels of human body organization, body fluid compartments, transport across cell membrane and bioelectrical phenomena of cell membrane. 2. Describe the divisions and functions of autonomic nervous system, chemical transmitters, receptors, and autonomic drugs. 3. Classify and describe blood components (structures, synthesis and functions)hemostasis, blood groups, anemia, and immunity 4. Describe the functions of different parts of cardiovascular system 5. Describe functions and mechanisms involved in human breathing. 6. Perform the physiological lab. tests related to body fluids, blood, CVS, and respiratory systems. |

## 3. Course Learning Outcomes

| **CLOs** | | **Aligned PLOs** |
| --- | --- | --- |
| 1 | **Knowledge:** |  |
| 1.1 | Describe the levels of organization of the human body, body fluids compartments, and the concept of homeostasis. | K1 |
| 1.2 | Reorganize the electrophysiology of nerve and muscle, autonomic receptors and neurotransmitters | K1 |
| 1.3 | Summarize the differences and effects of the two divisions of the autonomic nervous system. | K1 |
| 1.4 | List blood constituents and their functions | K1 |
| 1.5 | Describe cardiac muscle properties, cardiac cycle and control of arterial blood pressure. | K1 |
| 1.6 | Describe the functions of the respiratory system, gas diffusion, transport and control of ventilation. | K1 |
| **2** | **Skills :** |  |
| 2.1 | Interpret scientific information gained from performing the practical experiments related to body fluid, blood physiology, cardiovascular, and respiratory systems. | S3 |
| 2.2 |  |  |
| 2.3 |  |  |
| 2... |  |  |
| **3** | **Competence:** |  |
| 3.1 |  |  |
| 3.2 |  |  |
| 3.3 |  |  |
| 3... |  |  |

# C. Course Content

|  |  |  |
| --- | --- | --- |
| **No** | **List of Topics** | **Contact Hours** |
| 1 | Organization of human body (cell & its molecules –tissues- organs- organ system and organism) | 1(1+0) |
| 2 | Cell membrane (channels-protein carriers-types of transport through the cell membrane) | 2(0+2) |
| 3 | Measurement of osmolality of solutions and taking blood sample (lab) | **2(0+2)** |
|  | Body fluids compartments (total body water, intracellular, extracellular: interstitial, intravascular) and their measurement | 1(1+0) |
| 4 | Transport across cell membrane physiology (Passive and active mechanisms). | 2(2+0) |
| 5 | Determination of haemoglobin content (practical) | **2(0+2)** |
| 6 | Major electrolyte composition of body fluids and concept of homeostasis | 1(1+0) |
| 7 | Definition, physical properties and general functions of blood | 1(1+0) |
|  | Determination of RBCs count | **2(0+2)** |
| 8 | Blood components, structures, normal and abnormal count, synthesis and functions | 1(1+0) |
|  | Red blood cells, anaemia and polycythaemia | 2(1+0) |
|  | Determination of haematocrit value | **2(0+2)** |
| 12 | Blood groups and blood transfusion | 1(1+0) |
|  | White blood cells and immunity | 1(1+0) |
| 15 | Calculation of blood indices | **2(0+2)** |
|  | Hemostasis and its disorders (purpura- hemophilia- vit. K deficiency). | 1(1+0) |
|  | Anticoagulants. | 1(1+0) |
|  | Determination of WBCs count | **2(0+2)** |
| 13 | Resting membrane potential and action potential | 1(1+0) |
|  | Organization of the nervous system, organization and general functions of the autonomic nervous system | 1(1+0) |
| 15 | Determination of ESR | **2(0+2)** |
|  | Autonomic ganglia and neurotransmitters | 1(1+0) |
|  | Cholinergic and adrenergic receptors with their agonist and antagonist | 1(1+0) |
| 16 | Determination of osmotic fragility | **2(0+2)** |
|  | Comparison between sympathetic and parasympathetic divisions | 1(1+0) |
|  | Functions of cardiovascular system and properties of the cardiac muscle | 1(1+0) |
| 17 | Determination of blood groups | **2(0+2)** |
|  | Conducting system of the heart and ECG | 1(1+0) |
|  | Cardiac cycle and heart sounds | 1(1+0) |
| 18 | Determination of bleeding and clotting time | **2(0+2)** |
|  | Cardiac Output (COP) | 1(1+0) |
|  | Arterial Blood pressure and its control | 1(1+0) |
| 19 | Auscultation of heart sounds | **2(0+2)** |
|  | The vascular system and venous return | 1(1+0) |
| 20 | Recording ECG | **2(0+2)** |
|  | Measurement of blood pressure | **2(0+2)** |
|  | Pulmonary ventilation | 1(1+0) |
|  | Gas exchange | 1(1+0) |
| 21 | Lung volumes and capacities | **2(0+2)** |
|  | Gas transport | 1(1+0) |
|  | Control of ventilation; hypoxia; and cyanosis | 1(1+0) |
|  | Lung functions test | **2(0+2)** |
| **Total** | | **60** |

# D. Teaching and Assessment

## 1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

| **Code** | **Course Learning Outcomes** | **Teaching Strategies** | **Assessment Methods** |
| --- | --- | --- | --- |
| **1.0** | **Knowledge** | | |
| 1.1 | Describe the levels of organization of the human body, body fluids compartments, and the concept of homeostasis. | Interactive lectures | 1. Continuous assessment (Quizzes + Midterm exams) -(MCQs & SAQs )  2. Final exam: theoretical (MCQs) |
| 1.2 | Recognize the general cell physiology, types, and the mechanisms of membrane transport. | Interactive lectures | 1. Continuous assessment (Quizzes + Midterm exams) -(MCQs & SAQs )  2. Final exam: theoretical (MCQs) |
| 1.3 | Summarize the differences and effects of the two divisions of the autonomic nervous system. | Interactive lectures | 1. Continuous assessment (Quizzes + Midterm exams) -(MCQs & SAQs )  2. Final exam: theoretical (MCQs) |
| 1.4 | List blood constituents and their functions | Interactive lectures | 1. Continuous assessment (Quizzes + Midterm exams) -(MCQs & SAQs )  2. Final exam :theoretical (MCQs) |
| 1.5 | Describe cardiac muscle properties, cardiac cycle and control of arterial blood pressure. | Interactive lectures | 1. Continuous assessment (Quizzes + Midterm exams) -(MCQs & SAQs )  2. Final exam: theoretical (MCQs) |
| 1.6 | Describe the functions of the respiratory system, gas diffusion, transport and control of ventilation. | Interactive lectures | 1. Continuous assessment (Quizzes + Midterm exams) -(MCQs & SAQs )  2. Final exam: theoretical (MCQs) |
| **2.0** | **Skills** | | |
| 2.1 | Perform the practical experiments related to body fluid compartment, blood physiology, cardiovascular, and respiratory systems. | Practical sessions | Final exam: Practical (OSPE). |
| 2.2 |  |  |  |
| … |  |  |  |
| **3.0** | **Competence** | | |
| 3.1 |  |  |  |
| 3.2 |  |  |  |
| … |  |  |  |

## 2. Assessment Tasks for Students

| **#** | **Assessment task\*** | **Week Due** | **Percentage of Total Assessment Score** |
| --- | --- | --- | --- |
| **1** | Quiz-1 (written test - MCQs) | **4th** | **10 %** |
| **2** | Midterm (written test - MCQs & SAQs) | **9th** | **20 %** |
| **3** | Quiz-2 (written test - MCQs) | **11th** | **10 %** |
| **4** | Quiz -3 electronic exam | **13th** | **10%** |
| **5** | Oral exam | **14th** | **5%** |
| **6** | Assignment | **14th** | **5%** |
| **7** | Practical exam – (OSPE) electronic on blackboard | **15th** | **20%** |
| **8** | End of course Exam:  Theory - MCQs (electronic test on blackboard-) | **16th** | **20 %** |
|  | **Total** |  | **100 %** |

**\*Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

# E. Student Academic Counseling and Support

|  |
| --- |
| **Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :** |
| Dr. Ismail Elsayed (Course coordinator)  Office No. 275 (2nd floor, College of Applied Medical Sciences)  Office Hours: Monday: 10:00-12:00 pm  Wednesday: 10:00-12:00 pm  Mobile No.: 0507116891  Email: [ismaeelelsayed@gmail.com](mailto:ismaeelelsayed@gmail.com) |

# F. Learning Resources and Facilities

## 1.Learning Resources

|  |  |
| --- | --- |
| **Required Textbooks** | *Guyton and Hall Textbook of Medical Physiology, 13th Edition http://cdn.laedo.com/images/space.gif*by [*John E. Hall*](http://www.gettextbooks.com/author/John_E_Hall), [*Arthur C* *Guyton*](http://www.gettextbooks.com/author/Arthur_C_Guyton) Hardcover, 1120 Pages, Published (2016) by SaundersISBN: 9*78-4557-7005-2,* |
| **Essential References Materials** | Ganong's Review of Medical Physiology, 25th Edition *(LANGE Basic Science) 25th Edition by*[*Kim E. Barrett*](http://www.amazon.com/s/ref=dp_byline_sr_book_1?ie=UTF8&text=Kim+E.+Barrett&search-alias=books&field-author=Kim+E.+Barrett&sort=relevancerank)*(Author),*[*Susan M. Barman*](http://www.amazon.com/s/ref=dp_byline_sr_book_2?ie=UTF8&text=Susan+M.+Barman&search-alias=books&field-author=Susan+M.+Barman&sort=relevancerank)*(Author),*[*Scott Boitano*](http://www.amazon.com/s/ref=dp_byline_sr_book_3?ie=UTF8&text=Scott+Boitano&search-alias=books&field-author=Scott+Boitano&sort=relevancerank)*(Author),*[*Heddwen Brooks*](http://www.amazon.com/s/ref=dp_byline_sr_book_4?ie=UTF8&text=Heddwen+Brooks&search-alias=books&field-author=Heddwen+Brooks&sort=relevancerank)*(Author) McGraw-Hill's (2016*) ISBN 978-0-07-184897-8 |
| **Electronic Materials** | Saudi Digital Library (<https://sdl.edu.sa>) |
| **Other Learning Materials** | Adam's Interactive Physiology CD Series available from <http://www.adameducation.com/interactive-physiology>  http://www.comprehensivephysiology.com/WileyCDA/ |

## 2. Facilities Required

| **Item** | **Resources** |
| --- | --- |
| **Accommodation**  (Classrooms, laboratories, demonstration rooms/labs, etc.) | 1. Classroom suitable for 25 students equipped with multimedia projector. 2. Physiology lab equipped with recent physiology practical instruments and aids, and a multimedia projector |
| **Technology Resources**  (AV, data show, Smart Board, software, etc.) | * Internet access in the classroom and the lab. |
| **Other Resources**  (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list) | * Physiology research lab. |

# G. Course Quality Evaluation

| **Evaluation**  **Areas/Issues** | **Evaluators** | **Evaluation Methods** |
| --- | --- | --- |
| Achievement of course learning outcomes | The department council;  The students | Direct: discussion of exam results in the department meeting  Indirect – student questionnaire at the end of the course. |
| Course content | The department council;  The students | Direct: discussion of CS in the department meeting  Indirect - Questionnaire at the end of the course. |
| Effectiveness of teaching strategies | The students | Indirect - Questionnaire at the end of the course. |
| Effectiveness of assessment strategies | The department council;  The students | Direct: Analysis of exam results in department meeting  Indirect - Questionnaire at the end of the course. |
| Quality of learning resources | The students | Indirect - Questionnaire at the end of the course. |

**Evaluation areas** (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes,Quality oflearning resources, etc.)

**Evaluators** (Students,Faculty, Program Leaders,Peer Reviewer, Others (specify)

**Assessment Methods** (Direct, Indirect)

# H. Specification Approval Data

|  |  |
| --- | --- |
| **Council / Committee** | Council of the physiology department. |
| **Reference No.** | 1/1440-1441 |
| **Date** | 21/03/1442- 10/1/2021 |