UANL
UNIVERSIDAD AUTÓNOMA DE NUEVO LEÓN

FACULTAD DE MEDICINA

MODULE DESCRIPTION (ANALYTICAL PROGRAM).

1. Module Information Code:	
• Name of the Institution and School	Universidad Autónoma de Nuevo León, Facultad de Medicina
• Name of the Learning Unit	Physiology
• Total classroom hours for theory and/or practice.	136 hours
• Total extra classroom hours	104 hours
• Course Modality	Schooled
• Type of academic period in which the module is offered	3rd Semester
• Type of Learning Unit in the Curriculum	Compulsory
• Curriculum area:	ACFB
• UANL credit points	8
• Date of module creation:	August, 2015
• Date of last amendment:	August, 2015
• Person(s) responsible for the module design and amendments:	Dr. Daniel Alberto Mata Mendoza

2.- Introduction.

The learning unit is divided into 11 stages, the first one makes an introduction to the study of Physiology, relates it to the other subjects of the curriculum and to the clinical practice. In the second one, concepts of General Physiology are reviewed, in the third one, Cellular Physiology and in the fourth one, Physiology of Excitable Cells. From the fifth stage, the study of Physiology by apparatuses and systems begins, starting with the Nervous System, for being the main regulator of the function, to continue with the Endocrine System, second body regulator. Subsequently, the Physiology of Blood and the Cardiovascular System is studied as those responsible for delivering nutrients and collecting waste products throughout the body; followed by the study of lung function, also important in the cellular supply of oxygen as a substrate and the elimination of carbon dioxide. Next, the function of the urinary system is studied, which includes the elimination of body waste; and it is concluded with the gastrointestinal system, which is in charge of absorbing the necessary substrates for the cellular function.

3.- Purpose(s).

The learning unit of Physiology is located in the second year of the career, once the morphological sciences have been completed, which constitute the basis for the study of function, the learning object of Physiology; it is related to Biochemistry, regarding the study of the body's cellular function, and constitutes the basis for the subsequent study of Pharmacology, Internal Medicine and Surgery.

It contributes to achieve the profile of graduation in the domains corresponding to the scientific basis of medicine and clinical practice, by developing the necessary skills to make functional diagnosis through the analysis of homeostasis, laying the foundations of treatment; all this in a framework that allows the exercise of attitudes and skills of critical thinking and research; and through the management of the medical patient relationship in virtual cases, the subject matter promotes the acquisition of skills in professional values and ethics; organizational work and communication.

4.- Competences of the graduate profile

a. General competences contributing to this learning unit.

Instrumental skills:

1. Apply autonomous learning strategies in the different levels and fields of knowledge that allow them make appropriate and relevant decisions in the personal, academic and professional fields.

2. Use the logical, formal, mathematical, iconic, verbal and non-verbal languages according to their stage of life, in order to understand, interpret and express ideas, feelings, theories and streams of thinking with an ecumenical focus.

3. Use the information and communication technologies as access tools to information and its transformation in knowledge, as well as for learning and collaborative work with cutting-edge techniques that allow its constructive participation in society.

4. Dominate their native language in oral and written form with correctness, relevancy, opportunity and ethics adapting its message to the situation or context, in order to transmit of ideas and scientific findings.

5. Employ logical, critical, creative and proactive thinking to analyze natural and social phenomena that let them make relevant decisions in its area of influence with social responsibility.

6. Use a second language, English in particular, with clarity and correctness to communicate in common, academic, professional and scientific contexts.

7. Develop inter, multi and transdisciplinary academic and professional proposals according to the best global practices to promote and consolidate the collaborative work.

8. Use methods and techniques of traditional and cutting-edge research for the development of their academic work, the practice of their profession and the generation of knowledge.

Personal and social interaction skills

9. Maintain an attitude of commitment and respect towards the diversity of social and cultural practices that reaffirm the principle of integration in the local, national and international context with the purpose of promoting environments of peaceful coexistence.

10. Intervene in front of the challenges of contemporary society at the local and global level with a critical attitude and human, academic and professional commitment to help consolidate the general wellness and sustainable development.

11. Practice the values promoted by the UANL: truth, equality, honesty, liberty, solidarity, respect for life and anyone's, peace, respect for nature, integrity, ethics behavior and justice, within their personal and professional environment in order to make a sustainable society.

Integrative skills:

12. Make innovative proposals based on the holistic understanding of reality to help overcome the challenges of the interdependent global environment.

13. Take the lead according to social and professional needs to promote relevant social change.

14. Resolve personal and social conflicts in accordance with specific techniques in the academic field and their profession for the proper decision making.

15. Achieve the adaptability required in uncertain professional and social environments of our time to improve living conditions.

b. Specific competences of the graduate profile that contributes to the learning unit

1.- Use the medicine scientific fundaments considering economical, psychological, social, cultural and environmental factors which contribute to the development and evolution of a disease for decision-making and medical actions.

2.- Solves clinical problems through deductive reasoning, interpretation of findings and definition of their nature with the aim of making decisions and determine action principles of the medical practice to follow in a responsible way, impacting individual and collective health.

3. Manages information and communication technologies as a tool for accessing to information and transform it into knowledge, as well as for learning purposes and collaborative work with cutting-edge techniques which allow an edifying participation in society.

4.- Manages properly patients with the most frequent diseases from a biopsychosocial perspective, through the application of knowledge, technical procedures and basic diagnostic, based on clinical guides and attention protocols in order to solve the main health problems from the Primary Health Care level from individuals and the community.

5. Uses logical, critical, creative, and innovative thinking skills to analyze natural and social phenomena which allow him to make appropriate decisions in the field where he can influence with social responsibility.

6.- Manages human resources, diagnostic interventions, therapeutic modalities, and options on health care according to national standards, promoting a quality culture in attention and guaranteeing patients' security.

7.- Applies the scientific method for the resolution of medical problems with an innovative, analytic and self-critical attitude for preventing, diagnosing and treating diseases.

8.- Integrates professional values and ethics into his medical practice, making no difference due to gender, race, political or sexual preference, religious beliefs, activities developed, disabilities or socioeconomic level, promoting social inclusion and contributing to the population's well-being, their life quality and human development.

9.- Respects the patient's integrity keeping the patient's medical information as an essential part of their professional secret in order to preserve his rights.

10.- Promotes an organizational work culture for the health field, acknowledging the multidisciplinary work, respect for institutional policies and the observance of rules in order to contribute to a comprehensive treatment of patients.

11.- Applies effective communication principles, establishing a respectful and sympathetic relationship with the patient, relatives, the community and other health professionals in order to use the information properly.

5.- Course Roadmap.

Introduction to Human Physiology

Relates Physiology to the other learning units of the curriculum. and to clinical practice.

General Physiology.

The concepts applicable to Human Physiology and its relationship with clinical practice are analyzed.

Cellular Physiology.

The concepts applicable to human cells and their relationship with clinical practice are analyzed.

Physiology of Excitable Cells.

The Physiology of the neuron and the muscle cell is analyzed as a preamble to the study of Neurophysiology and its relationship with clinical practice.

Analyze the Physiology of the Nervous and Endocrine Systems as the main regulators of body functions and their relationship with clinical practice.

Physiology of regulatory systems.

The Physiology of the apparatus responsible for the transport of fluids and gas exchange of the hematopoietic system and the cardiovascular and pulmonary apparatus of the body is analyzed and related to clinical practice.

Physiology of the apparatus responsible for fluid transport and gas exchange.

Analyze the Physiology of the urinary and gastrointestinal apparatuses as responsible for the elimination of waste and absorption of nutrients and respectively from the body and is related to clinical practice.

Physiology of the devices responsible for body maintenance and exchange with the environment.

Integral evaluation of a patient with paper and pencil.

Course Integrative Product.

6. Structuring into stages or phases

Phase 1: Introduction
Component(s) of the competence:
Analyze homeostasis, as an object of study of Physiology, to relate it to the health-disease process.

Evidence of student learning	Performance Criteria	Learning activities	Content	Resources
Resolution of clinical cases of paper-and-pencil patients, by determining the homeostatic mechanism affected.	Identifies the homeostatic mechanism affected in the 20 most frequent pathologies according to SSA records.	Students are given a clinical case to be discussed in class. Previously the student must have studied and investigated everything related to the clinical case. The analysis of the case is initiated through questions directed by the professor with the objective of initiating the discussion of the relevant aspects of the case. Once the discussion between the students has started, the professor focuses on leading the discussion. At the end the professor emphasizes the relevant aspects of the case.	**Conceptual:** Homeostasis and its relationship to health and disease. Homeostatic control mechanisms. **Procedural:** Analyze clinical cases to identify the homeostatic mechanism affected. **Attitudinal:** Respect for life. Respect for the human being. Critical and creative thinking	Classroom equipped for voice and data projection PowerLab equipment approved for human use. Computer programs for learning Physiology. Departmental Library.

		Add laboratory activities and include the use of the laboratory manual.		

Phase 2: General Physiology
Component(s) of the competence:
Apply the International System of Units in the measurement of physiological variables and preparation of solutions to interpret the information contained in the clinical history.

Evidence of student learning	Performance Criteria	Learning activities	Content	Resources
Report in which it identifies the units of measurement used in clinical practice and relates them to the International System of Units. Preparation of solutions of different ionic, molar and osmolar concentration.	Identifies the units of the International System of Units in the clinical history. Identifies the units of the International System of Units most frequently used in clinical practice. Correctly write the units of the International System of Units. Determines the ionic, molar and osmolar concentration in different solutions. Determines the osmolarity of the solutions most frequently used in clinical practice.	Students are given a clinical case to be discussed in class. Previously the student must have studied and investigated everything related to the clinical case. The analysis of the case is initiated through questions directed by the professor with the objective of initiating the discussion of the relevant aspects of the case. Once the discussion between the students has started, the professor focuses on leading the discussion. At the end the professor emphasizes the relevant aspects of the case.	**Conceptual:** International System of Units. Units of concentration. Liquid body compartments. Transcapillary transport. **Procedural:** Use the International System of Units respecting the rules for its writing. Calculate the concentration of solutions. **Actitudinal:** Respect for life. Respect for the human being. Critical and creative thinking	Classroom equipped for voice and data projection PowerLab equipment approved for human use. Computer programs for learning Physiology. Departmental Library.

Phase 3: Cellular Physiology.

Component(s) of the competence:
Relate the cellular morphology with the function of the structures that conform it, to analyze the intercellular communication routes and the mechanisms of transduction and transmembrane and transepithelial transport.

Evidence of student learning	Performance Criteria	Learning activities	Content	Resources
Resolution of clinical cases of paper-and-pencil patients with alteration in intercellular communication pathways and transmembrane and transepithelial transport.	Determines the functional diagnosis. Identifies the physiopathology. Lay the foundation for the treatment. Calculates osmotic pressure in body solutions and predicts osmotic movement. Uses the method of dilution to measure the different liquid compartments of the body. Records, using a computer program, the membrane potential at rest and analyzes how it is affected by variations in serum electrolytes.	Students are given a clinical case to be discussed in class. Previously the student must have studied and investigated everything related to the clinical case. The analysis of the case is initiated through questions directed by the professor with the objective of initiating the discussion of the relevant aspects of the case. Once the discussion between the students has started, the professor focuses on leading the discussion. At the end the professor emphasizes the relevant aspects of the case.	**Conceptual:** Cellular structure. Intracellular liquid and its composition. Intercellular communication. Regulation of cellular function by transduction. Transmembrane transport mechanisms. Mechanisms of transepithelial transport. Membrane potential at rest. **Procedural:** Calculate the osmolarity of solutions. Measure the volume of body fluid compartments. Record membrane potentials.	Classroom equipped for voice and data projection PowerLab equipment approved for human use. Computer programs for learning Physiology. Departmental Library.

			Actitudinal: Respect for life. Respect for the human being. Critical and creative thinking	

Phase 4: Physiology of Excitable Cells.

Component(s) of the competence:
Analyze the structure of the neuron and the muscle cell, in the healthy individual, to relate it to their function as excitable cells, their regulation through the synapse and their relationship with the disease.

Evidence of student learning	Performance Criteria	Learning activities	Content	Resources
Resolution of clinical cases of paper-and-pencil patients with pathology of excitable cells.	Determines the functional diagnosis. Identifies the physiopathology. Lay the foundation for the treatment. Records, using a computer program, the action potential and analyzes how it is affected by variations in serum electrolytes. Records, using a computer program, the chemical synapse and analyzes the time and space constants.	Students are given a clinical case to be discussed in class. Previously the student must have studied and investigated everything related to the clinical case. The analysis of the case is initiated through questions directed by the professor with the objective of initiating the discussion of the relevant aspects of the case. Once the discussion between the students has started, the professor	**Conceptual:** Action potential. Neuronal morphology. Neuronal synapse. Neurotransmitters. Neuromuscular synapse. Muscle contraction. **Procedural:** Register action potentials. Record chemical synapse and determine time and space constants. Register the electromyogram.	Classroom equipped for voice and data projection PowerLab equipment approved for human use. Computer programs for learning Physiology. Departmental Library.

1st Partial Exam	Records and analyzes the electromyogram.	focuses on leading the discussion. At the end the professor emphasizes the relevant aspects of the case.	**Actitudinal:** Respect for life. Respect for the human being. Critical and creative thinking	

Phase 5: Neurophysiology.

Component(s) of the competence:
Analyze the functioning of the Nervous System, in paper and pencil clinical cases, to make a functional diagnosis of the most frequent diseases and to lay the foundations for their treatment.

Evidence of student learning	Performance Criteria	Learning activities	Content	Resources
Analysis and solution of clinical cases of paper-and-pencil patients with neurological pathology.	Determines the functional diagnosis. Identifies the physiopathology. Lay the foundation for the treatment. Records and analyzes the electroencephalogram. Records and analyzes electroneurography. Records and analyzes the strength of muscle contraction.	Students are given a clinical case to be discussed in class. Previously the student must have studied and investigated everything related to the clinical case. The analysis of the case is initiated through questions directed by the professor with the objective of initiating the discussion of the relevant aspects of the case. Once the discussion between the students has started, the professor	**Conceptual:** Blood irrigation and brain metabolism. CSF. Hematoencephalic barrier. General and special sensitivity. Motor control systems. State of consciousness. Autonomous Nervous System. Instinctive behavior and hematomas. Superior functions.	Classroom equipped for voice and data projection PowerLab equipment approved for human use. Computer programs for learning Physiology. Departmental Library.

	Using a computer program, it analyzes the function of the muscle spindle and its relationship to contraction. Performs and analyzes the osteotendinous reflexes. Records and analyzes the reaction time to a stimulus. Explores and analyzes the spatial discrimination of sensations in a healthy individual. Explores and analyzes the sensations of taste and smell in a healthy individual. Performs and analyzes eye reflexes. Use Snellen's charts to explore visual acuity. Performs and analyzes visual perimetry. Tests Weber and Rinne for screening hearing acuity. Explores the integrity of the vestibular apparatus in a healthy individual.	focuses on leading the discussion. At the end the professor emphasizes the relevant aspects of the case.	Aging and cerebral function. **Procedural:** Register the electroencephalogram. Register an electroneurography. Register the muscular contraction. Register the activity of the muscular spindle. Make the osteotendinous reflexes. Register the time of reaction to a stimulus. Explore the general sensitivity. Explore the special senses of taste and smell. Explore visual acuity with Snellen charts. Perform visual perimetry. Perform Weber and Rinne tests	

2nd Partial Exam	Records and analyzes the response of the Autonomous Nervous System to emotions. Performs and analyzes conditioned reflexes.		Perform the modified Barany test. Perform polygraph test. Perform conditioned reflexes. **Actitudinal:** Respect for life. Respect for the human being. Critical and creative thinking	

Phase 6: Physiology of the Endocrine System.

Component(s) of the competence:
Analyze the functioning of the Endocrine System, in clinical cases with paper and pencil, to make a functional diagnosis of the most frequent diseases and to lay the foundations for their treatment.

Evidence of student learning	Performance Criteria	Learning activities	Content	Resources
Analysis and solution of clinical cases of paper-and-pencil patients with endocrine pathology.	Determines the functional diagnosis. Identifies the physiopathology. Lay the foundation for the treatment. Interprets the results of the thyroid profile, makes a functional diagnosis and relates it to the physiopathology.	Students are given a clinical case to be discussed in class. Previously the student must have studied and investigated everything related to the clinical case. The analysis of the case is initiated through questions directed by the professor with the objective of	**Conceptual:** Generalities of hormones. Hypothalamus-pituitary axis Pituitary. Thyroid. Endocrine pancreas. Suprarenal gland.	Classroom equipped for voice and data projection PowerLab equipment approved for human use. Computer programs for learning Physiology. Departmental Library.

3rd Partial Exam	Perform the Immunological Pregnancy Test and interpret the results. Make the glucose tolerance curve and interpret the results. Performs anthropometric measurements and interprets them, relating them to the diagnosis of obesity and overweight. Performs nutritional assessment based on anthropometric measurements.	initiating the discussion of the relevant aspects of the case. Once the discussion between the students has started, the professor focuses on leading the discussion. At the end the professor emphasizes the relevant aspects of the case.	Parathormone Vitamin D. Calcitonin. Male gonads. Female gonads. Physiology of the sexual act. Physiology of pregnancy. Physiology of the childbirth. Physiology of lactation. Other organs with endocrine function. **Procedural:** Analyze the results of a thyroid profile. Perform the Pregnancy Immunology Test. Perform the Glucose Tolerance Curve. Perform the anthropometric nutritional evaluation. **Actitudinal:** Respect for life.	

			Respect for the human being. Critical and creative thinking	

Phase 7. Physiology of Blood.

Component(s) of the competence:
Analyze the functions of the blood, in clinical cases of paper and pencil, to make a functional diagnosis of the most frequent diseases and lay the foundations for their treatment.

Evidence of student learning	Performance criteria	Learning activities	Content	Resources
Analysis and solution of clinical cases of paper-and-pencil patients with hematological pathology.	Determines the functional diagnosis. Identifies the physiopathology. Lay the foundation for the treatment. Performs blood grouping and interprets the results. Performs the cross tests and interprets the results. Performs tests to assess homeostasis and interprets the results.	Students are given a clinical case to be discussed in class. Previously the student must have studied and investigated everything related to the clinical case. The analysis of the case is initiated through questions directed by the professor with the objective of initiating the discussion of the relevant aspects of the case. Once the discussion between the students has started, the professor focuses on leading the discussion.	**Conceptual:** Red blood cells. White blood cells. Blood groups. Hemostasis. **Procedural:** Perform the determination of Blood Group. Perform crossover tests. Perform the tests of bleeding time, coagulation time and prothrombin time. **Actitudinal:** Respect for life. Respect for the human being.	Classroom equipped for voice and data projection PowerLab equipment approved for human use. Computer programs for learning Physiology. Departmental Library.

		At the end the professor emphasizes the relevant aspects of the case.	Critical and creative thinking	

Phase 8. Physiology of the Cardiovascular System

Component(s) of the competence:
Analyze the functioning of the Cardiovascular System, in clinical cases with paper and pencil, to make a functional diagnosis of the most frequent diseases and lay the foundations for their treatment.

Evidence of student learning	Performance Criteria	Learning activities	Content	Resources
Analysis and solution of clinical cases of paper-and-pencil patients with cardiovascular pathology.	Determines the functional diagnosis. Identifies the physiopathology. Lay the foundation for the treatment. Performs the electrocardiographic recording and interprets it. Performs vectocardiography and interprets it. Records the electrocardiogram, respiration and pulse and relates them in time. Performs electrocardiographic and phonocardiographic	Students are given a clinical case to be discussed in class. Previously the student must have studied and investigated everything related to the clinical case. The analysis of the case is initiated through questions directed by the professor with the objective of initiating the discussion of the relevant aspects of the case. Once the discussion between the students has started, the professor focuses on leading the discussion. At the end the professor emphasizes the relevant aspects of the case.	**Conceptual:** Cardiac electrophysiology. Hemodynamics. Circulation in special regions. **Procedural:** Perform the electrocardiogram. Perform the vectocardiography. Perform the phonocardiography. Record blood pressure. Record hemodynamic changes by varying the preload, afterload, heart rate and force of contraction of the heart. **Attitudinal:**	Classroom equipped for voice and data projection PowerLab equipment approved for human use. Computer programs for learning Physiology. Departmental Library.

4th Partial Exam.	recording and relates them. Records the electrocardiogram on a person doing exercise and interprets the results. Records the cardiovascular response to water immersion (diving) and interprets the results Records, using a computer program, the hemodynamic effects that occur by modifying preload, postload, myocardial contraction and heart rate. Records blood pressure and analyzes the effect of gravity.		Respect for life. Respect for the human being. Critical and creative thinking.	

Phase 9. Physiology of the Respiratory System.

Component(s) of the competence:
Analyze the functioning of the respiratory system, in clinical cases of paper and pencil, to make a functional diagnosis of the most frequent diseases and to lay the foundations for their treatment.

Evidence of student learning	Performance Criteria	Learning activities	Content	Resources
Analysis and solution of clinical cases of paper-	Determines the functional diagnosis.	Students are given a clinical case to be discussed in class.	**Conceptual:** Physics of gases.	Classroom equipped for voice and data projection

and-pencil patients with pulmonary pathology.	Identifies the physiopathology. Lay the foundation for the treatment. Records a spirometry, measures the different lung volumes and capacities and interprets the results. Records respiratory movements at rest and in alkalosis and respiratory acidosis and interprets the results.	Previously the student must have studied and investigated everything related to the clinical case. The analysis of the case is initiated through questions directed by the professor with the objective of initiating the discussion of the relevant aspects of the case. Once the discussion between the students has started, the professor focuses on leading the discussion. At the end the professor emphasizes the relevant aspects of the case.	Mechanics of breathing. Pulmonary circulation. Relationship ventilation-perfusion. Gas exchange. Transport of oxygen and CO2 in blood. Breathing control. Evaluation of the respiratory function. **Procedural:** Record a spirometry. Record respiratory movements. **Attitudinal:** Respect for life. Respect for the human being. Critical and creative thinking.	PowerLab equipment approved for human use. Computer programs for learning Physiology. Departmental Library.

Phase 10: Physiology of the Urinary System.

Component(s) of the competence:
Analyze the functioning of the Urinary System, in clinical cases with paper and pencil, to make a functional diagnosis of the most frequent diseases and to lay the foundations for their treatment.

Evidence of student learning	Performance Criteria	Learning activities	Content	Resources
Analysis and solution of clinical cases of paper-and-pencil patients with urinary pathology.	Determines the functional diagnosis. Identifies the physiopathology. Lay the foundation for the treatment. Analyzes the mechanism of aqueous and osmotic diuresis secondary to the intake of liquid of different osmolarity.	Students are given a clinical case to be discussed in class. Previously the student must have studied and investigated everything related to the clinical case. The analysis of the case is initiated through questions directed by the professor with the objective of initiating the discussion of the relevant aspects of the case. Once the discussion between the students has started, the professor focuses on leading the discussion. At the end the professor emphasizes the relevant aspects of the case.	**Conceptual:** Body fluids. Functional anatomy of the kidney. Glomerular filtration. Tubular function and electrolytes. Dilution and concentration of urine. Regulation of acid-base balance. Urination. **Procedural:** Record the urinary osmolarity. **Attitudinal:** Respect for life. Respect for the human being. Critical and creative thinking.	Classroom equipped for voice and data projection PowerLab equipment approved for human use. Computer programs for learning Physiology. Departmental Library.

Phase 11: Physiology of the Digestive System.

Component(s) of the competence:
Analyze the functioning of the Digestive System, in clinical cases with paper and pencil, to make a functional diagnosis of the most frequent diseases and to lay the foundations for their treatment.

Evidence of student learning	Performance Criteria	Learning activities	Content	Resources
Analysis and solution of clinical cases of paper-and pencil patients with gastrointestinal pathology. 5th Partial Exam	Determines the functional diagnosis. Identifies the physiopathology. Lay the foundation for the treatment. Performs a skin electrogastrography and interprets the results.	Students are given a clinical case to be discussed in class. Previously the student must have studied and investigated everything related to the clinical case. The analysis of the case is initiated through questions directed by the professor with the objective of initiating the discussion of the relevant aspects of the case. Once the discussion between the students has started, the professor focuses on leading the discussion. At the end the professor emphasizes the relevant aspects of the case.	**Conceptual:** Relationship between structure and function. Salivary glands. Esophagus. Stomach. Exocrine pancreas. Gallbladder. Small intestine. Large intestine. Liver. **Procedural:** Record an electrogastrography. **Attitudinal:** Respect for life. Respect for the human being.	Classroom equipped for voice and data projection PowerLab equipment approved for human use. Computer programs for learning Physiology. Departmental Library.

			Critical and creative thinking.	

7.- Summative Evaluation.

Evidence of student learning	Weight
1st Partial Exam	12%
2nd Partial Exam	12%
3rd Partial Exam	12%
4th Partial Exam	12%
5th Partial Exam	12%
Course Integrative Product	10%
Final Exam	30%
Total	100

8.- Course Integrative Product

Comprehensive written evaluation of a patient, in which he identifies the homeostatic mechanism or mechanisms affected, analyzes the physiopathology and relates it to the signs and symptoms present in the patient's clinical picture, and determines the way in which all the apparatus and systems of the body are affected.

9.- References

Textbooks

Raff, H; Levitzky, M(2014). Fisiología Médica. Un enfoque por sistemas. Editorial Mc-Graw-Hill Interamericana. 1ª Edición.
Fernández Garza NE. (2015) Manual de Laboratorio de Fisiología. Editorial Mc-Graw-Hill Interamericana. 6ª Edición.
Barret, K.E.; Barman, SM; Boitano, S; Brooks, HL. (2010). Fisiología de Ganong. Editorial Mc-Graw-Hill Interamericana. 23ª Edición.
Costanzo, LS. (2014) Fisiología. Editorial Elsevier Saunders. 6ª Edición.

Websites

American Physiological Society, www.the-aps.org
Physiological Society, www.physoc.org
Society for Neurosciences, https://www.sfn.org

APPENDIX.

ASSESSMENT AND WORKLOAD

Module workload		Number of hours	Porcentaje
Contact hours	Class-based instruction	75h (55.14%)	56.66%= 136 hours
	Laboratories	48h (35.29%)	
	Exam taking	12h (8.82%)	
	Course Integrative Product (CIP)	1h (.73%)	
Independent study	Study	84h (80.76%)	43.33%= 104 hours
	Exam preparation	20h (19.23%)	
Total hours of the workload: 30 hours X 8 credits UANL/ECTS*		240 h	

*European Credit Transfer and Accumulation System
1 UANL credit = 30 hours

NOTE: Rubrics, checklists and evaluation formats are elaborated by using the performance criteria described in each stage of the module.

SUPLEMENTO COVID-19

Siguiendo las recomendaciones de la Secretaría de Salud del país y la Rectoría de la Universidad, ante la coyuntura de salud COVID-19, la organización de la docencia desde marzo del 2020, seguirá un modelo híbrido, donde la docencia se ajustará a los horarios aprobados por la Secretaría de Salud siguiendo un modelo de Presencialidad / No presencialidad en la medida en que las circunstancias sanitarias y la normativa lo permitan. Los estudiantes asistirán a las clases de manera no presencial mediante la transmisión de las mismas de manera síncrona/asíncrona vía “on line”.