

<b>1. Module identification code:</b>	
Name of the institution:	Universidad Autónoma de Nuevo León
Name of the school:	School of Medicine
Name of the degree program:	Clinical Chemistry
Name of the course (learning unit):	Management and quality in the clinical laboratory
Total number of class hours-theory and practice:	40
Class hours per week:	2 hours
Independent study:	20
Course modality:	Face-to-face instruction
Module level:	Eighth semester
Core/elective module:	Core
Curriculum area:	ACFP-F
UANL credit points:	2
Create date:	June 4 <sup>th</sup> , 2018
Date of last amendment made:	January 23 <sup>rd</sup> , 2024
Person(s) responsible for the design and amendment of the module:	PhD Sonia Lozano Quintanilla

## 2. Presentation:

The Clinical Chemist has a solid scientific training that prepares him to serve the labor market, mainly in clinical laboratories, both public and private. However, a large percentage of graduates face the administration of auxiliary clinical diagnostic services. In response to this challenge, this learning unit relates the knowledge acquired throughout the degree with various administrative tools, with the aim of achieving good performance in clinical laboratories.

To do this, this learning unit is developed through a sequence supported by the following stages:

Phase 1. Strategic planning of the clinical laboratory, where the student identifies the importance of administration, the stages to implement it and the elements that make up the administrative bases.

Phase 2. Organization of the clinical laboratory, where the student recognizes the resources necessary for the clinical laboratory, operational processes and basic knowledge of accounting.

Phase 3. Management of the clinical laboratory, where the student distinguishes the responsibilities of the managers of the clinical laboratory and the importance of human resource management.

Phase 4. Control of the clinical laboratory, where the student determines the techniques for managing the clinical laboratory, controlling the results and establishing the requirements to implement a quality management system.

The evidence and accredited activities developed in the previous stages allow the student to solve their course integrative product, prepared in a way that analyzes and proposes the solution to various problems or situations that the administrative staff of the clinical laboratory may face.

## 3. Purpose:

The purpose of this learning unit is to contribute to achieving the profile of the graduate through the development of competence, based on contemporary theories, and the implementation of the necessary tools to create and establish an administrative system that allows compliance with official requirements. and quality for the organization and operation of the clinical laboratory.

The unit collaborates with the achievement of three general competencies by developing individual logical and critical thinking, as well as a purposeful sense to establish and support administrative systems in the clinical laboratory and related areas. It allows the administrator to know and assume responsibility in making decisions based on the demand for quality, costs and efficiency to achieve the satisfaction of users of the laboratory service. It empowers graduates to intervene in the challenges and needs of Mexican society through critical development and human, academic, and mainly professional commitment to contribute to the well-being of society and the sustainability of services. Likewise, it provides the bases to resolve personal and social conflicts according to the appropriate administrative tools.



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Regarding the acquisition of specific competencies, the learning unit confers knowledge and logical and critical thinking to guarantee the reliability of the analytical results obtained in the clinical laboratory through the application of current quality control guidelines. Likewise, the content of the unit enables the graduate to ensure the necessary material, human, financial and infrastructure resources, applying quality management systems for the proper functioning and continuous improvement of clinical laboratories.

The learning unit of Administration and quality in the clinical laboratory is taught in the eighth semester of the Clinical Chemist Biologist Educational Program and is related to various learning units reviewed in previous semesters, such as: Ethics and Culture of Legality and Social Responsibility and Sustainable Development, which are based on the social sciences as well as administration, promote human development and elementary values for social interaction, in addition to presenting the foundations for the resolution of administrative problems and allowing the development of the critical thinking for decision making. All the learning units that make up Clinical Pathology are also related by combining the technical skills of clinical diagnosis and the administrative principles of quality control with the development and management of a clinical laboratory. The competencies acquired in the learning units prior to this unit provide the bases for the direction and achievement of quality services in the clinical laboratory.

#### **4. Competences of the graduate profile:**

##### **General competences to which this module (learning unit) contributes:**

###### *Instrumental skills:*

5. To use logical, critical, creative and proactive thinking to analyze natural and social phenomena that allow them to make relevant decisions in their sphere of influence with social responsibility.

###### *Personal and social interaction skills:*

10. To intervene in the face of the challenges of contemporary society at the local and global level with a critical attitude and human, academic and professional commitment to contribute to consolidating general well-being and sustainable development.

###### *Integrative skills:*

14. To resolve personal and social conflicts, in accordance with specific techniques in the academic field and in their profession for appropriate decision-making.

##### **Specific competences of the graduate profile to which this module (learning unit) contributes:**

7. To guarantee the reliability of the analytical results obtained by applying quality control guidelines as established by laboratory policies for correct decision-making.
8. To ensure the necessary resources by applying quality management systems for the proper functioning and continuous improvement of the laboratories.

## 5. Course roadmap:

### Phase 1. Strategic planning of the clinical laboratory

Identify the importance of administration, the stages for its implementation and the elements that make up the administrative bases

### Phase 2. Organizing of the clinical laboratory

Recognize the minimum resources, the relevant processes for operation and the basic knowledge of accounting

### Phase 3. Leading of the clinical laboratory

Distinguish the responsibilities of laboratory managers and the importance of human resource management

### Phase 4. Controlling of the clinical laboratory

Determine the techniques for controlling clinical laboratory results and the requirements for a quality management system

### Course Learning Product

Written evaluation of the basic contents of the administrative field in the clinical laboratory

## 6. Structuring into phases:

### Phase 1: Strategic planning of the clinical laboratory

**Component(s) of the competence:** Identify the importance of administration and the process to implement it in the clinical laboratory to define the elements that form the bases for its strategic planning.

Evidence of student learning	Performance criteria	Learning activities	Content	Resources
1. Midterm test on strategic planning of clinical laboratories	Correctly answer, individually and in writing, all the questions about the contents of Phase 1 of the learning unit at the place, day and time established by the teacher.	<p>The teacher presents, in the classroom, the analytical program of the learning unit and the conditions for working during the course.</p> <p>The teacher presents the main points of the content corresponding to this phase in the classroom, supported by digital presentations and infographics.</p> <p>The student, individually, participates during the class in the classroom with analysis based on the contents and resources reviewed.</p> <p>In teams, during and after class, students analyze the internal and external environment of</p>	<ul style="list-style-type: none"> <li>• Introduction to administration, business and organizations</li> <li>• Management process</li> <li>• Strategic planning of the clinical laboratory</li> <li>• Elements of strategic planning</li> <li>• Strategic planning techniques: Analysis of the environment and competitive position</li> <li>• Marketing Basics</li> </ul>	<p>Classroom equipped with projector</p> <p>Computer equipment with Microsoft Office and internet connection</p> <p>Teams digital platform</p> <p>Moodle digital platform of the UANL Faculty of Medicine</p> <p>Digital presentations prepared by the teacher</p> <p>Book excerpts: Münc, L. and García, J., (2020). <i>Unit 1: Introduction to the study of administration in Fundamentals of Administration</i></p>

		<p>a clinical laboratory and present it to the group in the classroom <b>(Accredited Activity 1.1)</b></p> <p>During classroom classes, the teacher intervenes in the participation of students to provide feedback.</p> <p>The student receives and analyzes feedback, through the Moodle platform and in classroom classes, regarding their participation corresponding to the elements of the competition.</p> <p>The student investigates sites with free educational resources.</p> <p>The student verifies compliance with the elements required to develop evidence 1.</p> <p>The student receives and analyzes feedback from the teacher, through the Moodle</p>		<p>Münch, L. and García, J., (2020). <i>Unit 2: Business in Fundamentals of Administration</i></p> <p>Münch, L. and García, J., (2020). <i>Unit 3: Planning in Administration Fundamentals</i></p>
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		platform and in classroom classes, regarding evidence 1.		
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**Phase 2: Organizing of the clinical laboratory**

**Component(s) of the competence:** Recognize the material, technological, human and financial resources, as well as the operational, administrative and accounting processes necessary to legally operate the clinical laboratory under the relevant regulations, reflecting the appropriate allocation of resources.

Evidence of student learning	Performance criteria	Learning activities	Content	Resources
2. Midterm test on organizing of the clinical laboratory	Correctly answer, individually and in writing, all the questions about the contents of Phase 2 of the learning unit at the place, day and time established by the teacher.	<p>The teacher presents the main points of the content corresponding to this phase in the classroom, supported by digital presentations and infographics.</p> <p>The student, individually, participates during the class in the classroom with analysis based on the contents and resources reviewed.</p> <p>As a team, during and after class, students prepare work distribution tables for all clinical laboratory staff and present them to the group in class <b>(Accredited Activity 2.1)</b></p> <p>In teams, during and after class, students</p>	<ul style="list-style-type: none"> <li>Organizing of the clinical laboratory</li> <li>Organizational tools and techniques</li> <li>Safety, hygiene and biosecurity</li> <li>Clinical laboratory infrastructure and conditions</li> <li>Fundamentals of cost accounting</li> <li>Fundamentals of financial accounting</li> </ul>	<p>Classroom equipped with projector</p> <p>Computer equipment with Microsoft Office and internet connection</p> <p>Teams digital platform</p> <p>Moodle digital platform of the UANL Faculty of Medicine</p> <p>Digital presentations prepared by the teacher</p> <p>Book excerpts: Münc, L. and García, J., (2020). <i>Unit 4: Organization in Fundamentals of Administration</i></p> <p>NOM-016-SSA3-2012</p> <p>NOM-087-ECOL-SSA1-</p>

		<p>solve basic accounting exercises and financial statements of a clinical laboratory and present them to the group in the classroom (<b>Accredited Activity 2.2</b>)</p> <p>During classroom classes, the teacher intervenes in the participation of students to provide feedback.</p> <p>The student receives and analyzes feedback, through the Moodle platform and in classroom classes, regarding their participation corresponding to the elements of the competition.</p> <p>The student investigates sites with free educational resources.</p> <p>The student verifies compliance with the elements required to develop evidence 2.</p> <p>The student receives</p>		<p>2002</p> <p>PROJECT-NOM-005-STPS-2004</p> <p>PROJ-NOM-007-SSA3-2017</p>
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		and analyzes feedback from the teacher, through the Moodle platform and in classroom classes, regarding evidence 2.		
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**Phase 3: Leading of the clinical laboratory**

**Component(s) of the competence:** Distinguish the functions and obligations of management, as well as the importance of human resource management in accordance with the philosophy of high performance, to promote the competitiveness of the clinical laboratory and of the people.

Evidence of student learning	Performance criteria	Learning activities	Content	Resources
3. Midterm test on leading of the clinical laboratory	Correctly answer, individually and in writing, all the questions about the contents of Phase 3 of the learning unit at the place, day and time established by the teacher.	<p>The teacher presents the main points of the content corresponding to this phase in the classroom, supported by digital presentations and infographics.</p> <p>The student, individually, participates during the class in the classroom with analysis based on the contents and resources reviewed.</p> <p>As a team, during and after class, students design a strategy for coordinating resources and promoting organizational culture and present it to the group in the classroom <b>(Accredited Activity 3.1)</b></p> <p>During classroom</p>	<ul style="list-style-type: none"> <li>• Leading of the clinical laboratory</li> <li>• Leadership and motivation</li> <li>• Managerial skills and organizational behavior</li> </ul>	<p>Classroom equipped with projector</p> <p>Computer equipment with Microsoft Office and internet connection</p> <p>Teams digital platform</p> <p>Moodle digital platform of the UANL Faculty of Medicine</p> <p>Digital presentations prepared by the teacher</p> <p>Book excerpts: Münch, L. and García, J., (2020). <i>Unit 5: Management in Fundamentals of Administration</i></p> <p>Arias, F. and Heredia, V., (2006). <i>Chapters 6</i></p>



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		<p>classes, the teacher intervenes in the participation of students to provide feedback.</p> <p>The student receives and analyzes feedback, through the Moodle platform and in classroom classes, regarding their participation corresponding to the elements of the competition.</p> <p>The student investigates sites with free educational resources.</p> <p>The student verifies compliance with the elements required to develop evidence 3.</p> <p>The student receives and analyzes feedback from the teacher, through the Moodle platform and in classroom classes, regarding evidence 3.</p>		<p><i>to 8 in Human Resources Management: for high performance</i></p>
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**Phase 4: Controlling of the clinical laboratory**

**Component(s) of the competence:** Describe the bases of the control process, as well as determine the activities, strategies and tools necessary for the implementation of a quality management system that guarantees compliance with quality requirements in the clinical laboratory.

Evidence of student learning	Performance criteria	Learning activities	Content	Resources
4. Midterm test on controlling of the clinical laboratory	Correctly answer, individually and in writing, all the questions about the contents of Phase 4 of the learning unit at the place, day and time established by the teacher.	<p>The teacher presents the main points of the content corresponding to this phase in the classroom, supported by digital presentations and infographics.</p> <p>The student, individually, participates during the class in the classroom with analysis based on the contents and resources reviewed.</p> <p>As a team, during and after class, students design a continuous improvement program for the clinical laboratory, through analysis and brainstorming, and present it to the group in the classroom</p> <p><b>(Accredited Activity</b></p>	<ul style="list-style-type: none"> <li>• Controlling of the clinical laboratory</li> <li>• Continuous quality monitoring and improvement</li> <li>• Quality Management Systems</li> <li>• Quality requirements in the clinical laboratory</li> </ul>	<p>Classroom equipped with projector</p> <p>Computer equipment with Microsoft Office and internet connection</p> <p>Teams digital platform</p> <p>Moodle digital platform of the UANL Faculty of Medicine</p> <p>Digital presentations prepared by the teacher</p> <p>Book excerpts: Fernández-Espina, C. and Mazziota, D., (2005). <i>Chapters I to VI, Part I in Quality Management in the</i></p>

		<p><b>4.1)</b></p> <p>During classroom classes, the teacher intervenes in the participation of students to provide feedback.</p> <p>The student receives and analyzes feedback, through the Moodle platform and in classroom classes, regarding their participation corresponding to the elements of the competition.</p> <p>The student investigates sites with free educational resources.</p> <p>The student verifies compliance with the elements required to develop evidence 4.</p> <p>The student receives and analyzes feedback from the teacher, through the Moodle platform and in classroom classes, regarding evidence 4.</p>		<p><i>Clinical Laboratory</i></p> <p>Münc, L. and García, J., (2020). <i>Unit 6: Control in Fundamentals of Administration</i></p> <p>NMX-CC-9001-IMNC-2015</p> <p>NMX-EC-15189-IMNC-2015</p>
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**7. Summative evaluation:**

**Assessment scheme for the Learning Unit by Stages and Evidence of Student Learning:**

Phase	Evidence and accredited activities	Weighing
Phase 1 (20%)	<b>Evidence 1. Midterm test on strategic planning of the clinical laboratory</b>	<b>12 points</b>
	<i>Accredited Activity 1.1 Analysis of the clinical laboratory environment</i>	<b>8 points</b>
Phase 2 (20%)	<b>Evidence 2. Midterm test on organizing of the clinical laboratory</b>	<b>12 points</b>
	<i>Accredited Activity 2.1 Preparation of work distribution tables</i>	<b>4 points</b>
	<i>Accredited Activity 2.2 Solution of basic accounting and financial statements exercises</i>	<b>4 points</b>
Phase 3 (18%)	<b>Evidence 3. Midterm test on leading of the clinical laboratory</b>	<b>10 points</b>
	<i>Accredited Activity 3.1 Design of a strategy for the coordination of resources and promotion of organizational culture</i>	<b>8 points</b>
Phase 4 (18%)	<b>Evidence 4. Midterm test on controlling of the clinical laboratory</b>	<b>10 points</b>
	<i>Accredited Activity 4.1 Design of a continuous improvement program for the clinical laboratory</i>	<b>8 points</b>
CIP (24%)	<b>Test with questions and exercises on the content of the learning unit</b>	<b>24 points</b>
<b>Total</b>		<b>100 points</b>

### 8. Course integrative product:

Written assessment with multiple choice questions and exercises on the content of the learning unit.

### 9. References:

- Arias, F. and Heredia, V., (2006). *Human Resources Management: for high performance* , 6th Edition, Mexico: Editorial Trillas.
- Fernández-Espina, C. and Mazziota , D., (2005). *Quality Management in the Clinical Laboratory* , 1st Edition, Buenos Aires: Editorial Médica Panamericana.**
- Münch, L. and García, J., (2020). *Fundamentals of Administration* , 14th Edition, Mexico: Editorial Trillas.
- Ministry of Economy. (2015). NMX-CC-9001-IMNC-2015, *Quality management systems - requirements* . Mexico: Mexican Institute for Standardization and Certification.
- Ministry of Economy. (2015). NMX-EC-15189-IMNC-2015, *Clinical laboratories - Quality and competence requirements*. Mexico: Mexican Institute for Standardization and Certification.
- Ministry of Environment and Natural Resources. (2002). NOM-087-ECOL-SSA1-2002, *Environmental protection - Environmental health - Biological-infectious hazardous waste - Classification and handling specifications*. Mexico: Official Journal of the Federation. Retrieved January 11, 2017, from <http://www.salud.gob.mx/unidades/cdi/nom/087ecolssa.html>
- Ministry of Health. (2017). PROY-NOM-007-SSA3-2017, *For the organization and operation of clinical laboratories*. Mexico: Official Journal of the Federation. Retrieved June 6, 2018, from [http://www.dof.gob.mx/nota\\_detalle.php?codigo=5511878&fecha=01/31/2018](http://www.dof.gob.mx/nota_detalle.php?codigo=5511878&fecha=01/31/2018)
- Ministry of Health. (2012) NOM-016-SSA3-2012, *Which establishes the minimum infrastructure and equipment requirements for hospitals and specialized medical care offices* . Mexico: Official Gazette of the Federation. Retrieved on June 6, 2018, from [http://www.dof.gob.mx/nota\\_detalle.php?codigo=5284306&fecha=08/01/2013](http://www.dof.gob.mx/nota_detalle.php?codigo=5284306&fecha=08/01/2013)
- Ministry of Labor and Social Welfare. (2004). PROY-NOM-005-STPS-2004, *Management of hazardous chemical substances – Safety and health conditions and procedures in the workplace* . Mexico: Official Gazette of the Federation. Retrieved on June 6, 2018, from <http://www.dof.gob.mx/normasOficiales/3427/STPS/STPS.htm>