

| 1. Module identification code. | |
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| 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): | Application of information technologies |
| 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: | First semester |
| Core/elective module: | Core |
| Curriculum area: | ACFB |
| UANL credit points: | 2 |
| Create date: | May 9 th , 2017 |
| Date of last amendment made: | July 11 th , 2022 |
| Person(s) responsible for the design and amendment of the module: | M. A. Engineer Angel Enrique Alcorta Garza |

2. Presentation:

The learning unit is offered in face-to-face school mode. It is developed in two phases: The first contemplates describing the main characteristics of the computer, hardware and software, Ms-Office tools, Word, PowerPoint, to produce quality electronic documents.

In the second phase, the tools of information technologies, Excel and the Internet, database analysis, consultation of Web references, are described to contrast or assess the results that support the solution of problems in the biochemical field, until the project of the Integrative Learning Product is concluded.

3. Purpose:

The purpose of the learning unit (UA) is to train students to develop skills in the use of information technologies, either in face-to-face or out-of-school mode, which will serve them for the implementation and validation of methods in the solution of problems in the biochemical field.

During the UA, the student will develop skills in the management of information and communication technologies as tools for access to information and its transformation into knowledge, through computational practice by preparing written evidence in electronic format, text documents, databases and presentations. They will practice the values promoted by the University, by preparing and presenting written evidence in electronic format to their classmates and professors. The student will use the various information technologies to create better living conditions when carrying out their activities, by working as a team with respect and a positive attitude, in their social and professional environment.

Regarding specific competencies, the student will make use of information technologies to carry out bibliographic searches, which will allow them to incorporate new analytical methodologies for the laboratory.

The learning unit facilitates the advanced generation of text documents, presentations, and databases; is located in the first semester of the Clinical Chemistry curriculum, relates to all the learning units of the curriculum, e.g. Biostatistics, Analytical Chemistry and Instrumental Analysis, applying information technologies by searching for information through them and using them to perform data analysis around problems in the biochemical field.

4. Competences of the graduate profile

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

Instrumental skills:

3. To manage Digital Information, Communication, Knowledge and Learning Technologies (TICCAD), in academic, personal and professional environments with cutting-edge techniques that allow their constructive and collaborative participation in society.

Personal and social interaction skills:

11. To practice the values promoted by the UANL: truth, equity, honesty, freedom, solidarity, respect for life and others, peace, respect for nature, integrity, ethical behavior and justice, in their personal and professional environment to contribute to building a sustainable society

Integrative skills:

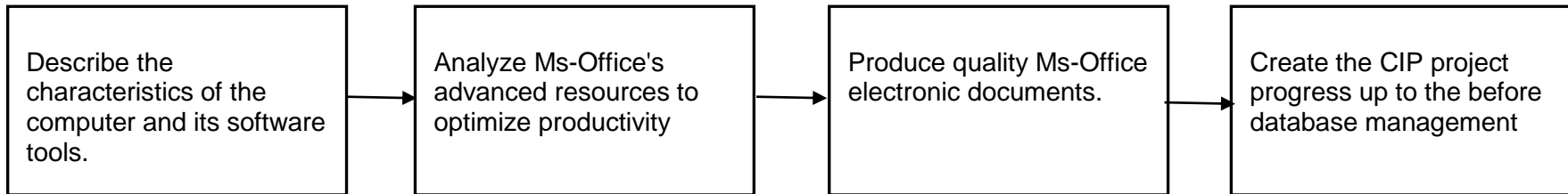
14. To achieve the adaptability required by the uncertain social and professional environments of our time to create better living conditions.

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

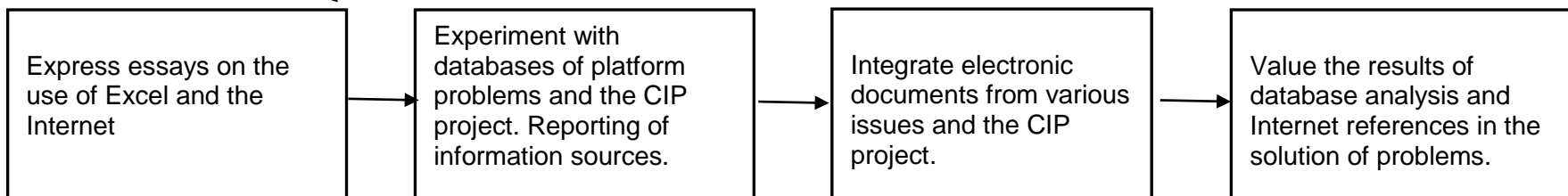
5. To incorporate new analytical methodology that contributes to the functional, economic and/or environmental improvement of laboratory processes to respond to needs in health areas.

5. Course roadmap:

Phase 1.



Phase 2.



6. Structuring into stages or phases:

Stage 1: Information Technology Tools.

Component(s) of the competence: Produce electronic documents and presentations, through the proper use of the main functions of technological tools such as MS-Office for Windows, to communicate ideas and thoughts.

| Evidence of student learning | Performance criteria | Learning activities | Content | Resources |
|--|--|--|---|---|
| 1. Electronic Word and PowerPoint documents. | <p>The student participates in face-to-face class and interacts through the Moodle Platforms.</p> <p>Integrates documents with content from the biochemical area.</p> <p>Present the evidence considering a minimum size of one page and 10 slides for electronic presentation, format with elements of style, design, images, tables with design, and respect the structure as it is.</p> <p>Deliver the evidence through the Moodle platform.</p> <p>The documents it submits are:</p> <ul style="list-style-type: none"> • Essay on computer | <p>The teacher presents the framework of the learning unit (UA), either face-to-face or virtually.</p> <p>The student analyzes the characteristics of the computer, interacts virtually with the teacher and work group, through the Moodle platform and performs an essay (weighted activity).</p> <p>The teacher facilitates the teaching process for the student, who produces evidence with information technology tools.</p> <p>The student reads the book unit 1 and 2 in a comprehensive reading on the recommendations for communicating information through the</p> | <ul style="list-style-type: none"> • Personal computer software and hardware. • Advanced document editing. • Effective presentation. • Resources to optimize productivity • Planning. • Structure. • Design • Styles. • Templates. • Desktop publishing • Stalemate • Spelling. • References • Imagery. • Audio and video. • Database | <p>Project-Based Learning, Presentation.</p> <p>Textbook on the Application of Information Technologies, Elizondo (2015).</p> |

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| | <p>characteristics.</p> <ul style="list-style-type: none"> • Advanced document editing essay. • Resume. • Formal letter. • Electronic filing of unit 2. • PowerPoint presentation of a biochemical topic. | <p>production of quality documents.</p> <p>The teacher explains the Course integrative project/product (CIP), so that the student integrate on a daily basis. (Accredited activity)</p> | | |
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Stage 2: Introduction to Microbiology

Spreadsheet models and document search.

Component(s) of the competence:

To use the functions of the tools and the documentary search for information for the study of problems in the biochemical field.

| Evidence of student learning | Performance criteria | Learning activities | Content | Resources |
|---|---|--|---|--|
| 2. Database reports (DB) in Excel and the Internet. | <p>The student participates in face-to-face classes and interacts through the Moodle Platform.</p> <p>Integrates evidence with biochemistry content, Word, and Excel data analysis</p> <p>The documents it submits are:</p> <p>2.1 Essay on spreadsheet models.</p> | <p>The professor describes the IT tools, Excel and the Internet, which support the solution of problems in the biochemical field.</p> <p>Students read comprehension of units 3 and 4 of the textbook, in addition, consult Internet references.</p> <p>The student performs</p> | <p>Excel (spreadsheet) concepts:</p> <ul style="list-style-type: none"> • Cells. • Ranges. • Tools. • Functions. • Data. • Analysis. • Stalemate. • Graphics. | <p>Computer equipment with Windows, Microsoft Office and internet connection.</p> <p>-Moodle platform, Mentimeter, Kahoot.</p> <p>-Electronic presentation for free use prepared by the teacher.</p> <p>Teaching support material: Essay, Synoptic table, Concept map,</p> |

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| | <p>Minimum 4 pages, typography, size 11 cpi.</p> <p>2.2 Unit 4 Essay, Structured Publication of Resources. At least 3 pages with pictures, examples.</p> <p>2.3 Databases of the problem of unit 3, published on the Moodle platform.</p> <p>2.4 Population and sample of the CIP project database. Minimum of 50 cases.</p> <p>2.5 Writing of the CIP Project, progress for partial 1, minimum 10 hypotheses.</p> <p>2.6 Writing and analysis of data from the CIP Project, progress for partial 2.</p> <p>2.7 Writing, results and conclusions of the CIP, partial progress 3.</p> <p>2.8 Integrated final project of the CIP Project.</p> | <p>spreadsheet exercises proposed on the Moodle Platform:</p> <p>(1) With Excel functions (weighted activity).</p> <p>(2) Patient database (weighted activity).</p> <p>(3) Pivot tables (weighted activity).</p> <p>(4) Case resolution (weighted activity).</p> <p>The student performs exercises to search for reliable publications on the web, to contrast the theories against the results of their problem and will deliver a report of this activity.</p> | <p>Internet:</p> <ul style="list-style-type: none"> • Search engines. • Sources of information | <p>comprehensive reading Project-based learning, Presentation.</p> <p>Unit 1, 3 and 4 of the textbook on the Application of Information Technologies, Elizondo (2015).</p> <p>Problems described in the Moodle platform.</p> |
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7. Summative evaluation:

| Phase | Evidence | Weighing |
|----------------|---|----------|
| Phase 1 | 1. Electronic Word and PowerPoint documents: | |
| | Essay on advanced document editing. | 5% |
| | Resume. | 4% |
| | Formal letter to the director. | 4% |
| | PowerPoint presentation | 5% |
| | Accredited activity 1. • Create CIP project up to the previous database management | 7% |
| Phase 2 | 2. Database reports in Excel and the Internet: | |
| | • Essay on spreadsheet models. | 3% |
| | • Essay on the Internet. | 3% |
| | • Platform problem databases. | 10% |
| | • CIP project database. | 4% |
| | • Reporting of information sources. | 5% |
| | | |
| | Activity: Spreadsheet exercises presented on the Moodle platform: | |
| | • With Excel functions. | 5% |
| | • Patient database. | 5% |

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| | • Pivot tables. | 5% |
| | • Case resolution. | 5% |
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| CIP | Course integrative project/product | 30% |
| | Total | 100% |

8. Course integrative project/product:

Proposal to the solution of a case posed, where the various information technologies learned are applied. It must be an unpublished product, on a subject related to the biochemical field. The structure must contain: cover, index, theoretical framework, hypothesis, justification of the sample, database, analysis, results, conclusions, sources of support and consultation.

9. References:

Elizondo, R. A., Sarabia, J. (2009), Application of Information Technologies, 2nd. Edition, Mexico: Grupo Editorial Patria/UANL.

Huidobro, J. (2007). Information and communication technologies. Polytechnic University of Madrid, 2.

Madruga Payno, Microsoft® Office 2013: Anaya Multimedia.

Professional office automation, Microsoft® Office 2013: ENI Editores.

PAHO/WHO. Regional Mortality Information System; Washington DC;2014 Last updated:May 24, 2014. (IB14-28)

Porto WF, Pires AS, Franco OL (2017) Computational tools for exploring sequence databases as a resource for antimicrobial peptides. Biotechnology Advances.

• <https://dti.uanl.mx/crea-dti-recursos-educativos-digitales/> Eureka Journal on Science Teaching and Dissemination (2005), Vol. 2, No. 1, pp. 2-18, Applications of Information and Communication Technologies in Science Education.