PROFESSIONAL INTERNSHIPS IME

LEARNING OUTCOMES

A. GENERAL LEARNING OBJECTIVE

At the end of the course, the student will be able to develop professional activities according to the graduate profile of the electromechanical engineering program to strengthen the essential skills in their profession through insertion in spaces according to their future work field.

B. EDUCATIONAL CONTENTS

STUDENT OUTCOMES TO WHICH THE TRAINING SPACE CONTRIBUTES.

Specific student outcomes	1.- An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics. 2.- An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors. 6.- An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
Student outcomes of emphasis	Does not apply

PERFORMANCE INDICATORS, SKILLS AND SCIENTIFIC-PROFESSIONAL KNOWLEDGE
The professional performance indicators, knowledge and skills promoted by this formation space are:

Learning results that the student will achieve in this training space	
Performance indicators	The student… 1.1 Relates the physical phenomena to the theories and mathematical models that describe them. 1.2 Applies theoretical knowledge to solve complex engineering problems. 1.3 Applies knowledge of different areas of engineering to solve complex engineering problems. 1.4 Calculates the geometric dimensions and stresses of mechanical elements subjected to loads. 1.5 Applies the mathematical models of electromechanical components, such as motors, generators, transformers, pumps, hydraulic actuators, pneumatic actuators and compressors. 1.6 Identifies and calculates the different forms of energy involved in mechanical, electrical, thermal, pneumatic, hydraulic, etc. systems. 1.7 Interprets and produces mechanical, electrical, pneumatic, hydraulic and control diagrams using symbology according to standards. 1.8 Calculates components of systems of conversion, transmission and distribution of electrical energy. 1.9 Identifies and performs calculations for the integration of renewable energy systems. 1.10 Identifies opportunities and applies strategies for energy savings in electromechanical systems. 1.11 Implements preventive and corrective maintenance work in electromechanical systems. 1.12 Uses specialized software to analyze mathematical models that describe the behavior of electromechanical components or systems. 2.1 Applies a methodology for the design of a component, system or process.

	2.2 Applies a methodology to weigh the technical, economic, environmental and social requirements that must be met by the design of a component, system or process. 2.3 Identifies and evaluates design constraints. 2.4 Applies a methodology for analysis and decision-making to design alternatives. 2.5 Establishes the technical, economic and environmental specifications that a component, system or process must meet. 2.6 Identifies various electromechanical components that can meet the functional requirements of a system or process. 2.7 Identifies and selects the manufacturing processes necessary to build an electromechanical component or system. 2.8 Establishes the quality criteria of a product or process. 2.9 Calculates the direct and indirect costs of a project. 2.10 Evaluates the net present value and the internal rate of return of a project. 2.11 Makes a quote to sell engineering services. 2.12 Uses modern engineering devices to control and automate equipment or processes. 6.1 Identifies the need for experiments. 6.2 Selects the materials, devices and methods necessary to design experiments. 6.3 Uses a logical organization of procedures and applies mathematical and graphic analysis to interpret the results of an experiment. 6.4 Identifies in advance the problems that may arise in an experiment. 6.5 Describes the experimental results and their relationship with fundamental concepts and principles. 6.7 Uses modern and appropriate computing resources for engineering practice. 6.8 Uses and interprets results of materials and electrical equipment testing.
Knowledge	The knowledge is variable and depends on the sector or field where the practices are developed, some transversal knowledge are: Organization and administration of the productive sector of the labor field of the electromechanical engineering graduate. Attitudes and skills that a graduate must have to excel in the labor field. Amplitude of the labor field of the electromechanical engineering graduate. Accountability. Report writing.
Skills	Writing reports of results of engineering works. Business Administration. Teamwork. Compliance with objectives and goals.

C. UASLP GRADUATE: PERFORMANCE INDICATORS AND TRANSVERSAL SKILLS

Graduate profile UASLP	Performance indicators and transversal skills promoted by this training space
Professional autonomy for learning (an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.**)**	The student… 7.1 Recognizes the importance of learning and using sources different of information to prepare projects and reports. 7.2 Seeks to constantly improve their knowledge related to their profession. 7.3 Has the ability to learn through the selection of reliable information sources. 7.4 Has information of engineering state-of-the-art.
Collaborative work skills (an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive	The student… 5.1 Contributes positively and widely to the work team. 5.2 Assumes responsibilities as a team member. 5.3 Expresses his/her ideas and concerns without fear. 5.4 Assumes leadership responsibilities.

environment, establish goals, plan tasks, and meet objectives)	5.5 Identifies the roles, responsibilities and expectations of leading a team. 5.6 Uses strategies to respond to disagreement, focusing on constructive conflict resolution and consensus building
Communication skills in spanish and other languages (an ability to communicate effectively with a range of audiences)	The student… 3.1 Has organized oral communication, being consistent with the central message and using appropriate body language to express one's ideas. 3.2 Has organized written communication, which is consistent with the central message identified in the introduction, where the main points are linked to transitions and a conclusion. 3.3 Uses modern presentation tools, such as audio, video, etc. effectively. 3.4 Uses extensive and appropriate vocabulary, as well as correct grammar. 3.5 Communicates orally and in writing in a language other than the first language. 3.6 Prepares technical reports where made judgments as products of the results of engineering solutions.
Scientific, professional, and/or social creative project development	This student outcomes in engineering is considered as specific professional, the performance indicators are already integrated within this training space.
Social responsibility and ethical reflection (an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts)	The student… 4.1 Identifies the facts and work methods considering ethical principles. 4.2 Rejects work that has the purpose of violating the general interest of society. 4.3 Avoids putting personal interests before the matters entrusted, or colluding to exercise unfair competition. 4.4 Safeguards the interests of the institution or persons and makes good use of the resources allocated for the performance of their activities. 4.5 Complies with society, attending to the welfare and progress of the majority. 4.6 Complies with the regulations to calculate, install and operate electromechanical systems. 4.7 Demonstrates responsibility and awareness of the consequences of his/her activities for society in general. 4.8 Understands how economic factors affect professional practice. 4.9 Is aware of a variety of current events in a national and global context. 4.10 Selects the techniques and tools to give modern engineering solutions and makes judgments comparing the results with the alternative tools or techniques. 4.11 Manages the human and material resources necessary to maintain the operation of electromechanical systems.

GENERAL STRUCTURE AND SUMMATIVE EVALUATION

D. General didactic planning

During the course the student will gain experience in developing professional activities outside university spaces. The activities will be carried out in the productive and service sectors and these are different for each student. The professor of the subject will approve the completion of the internships, reviewing that they promote the performance indicators of each student outcome. The total hours of the course are 240 h. The student must submit a report every 80 hours of activity and a final report.

#	Name of the unit or training	Unit learning objective	Specific educative contents (performance indicators, skills, knowledge)

	phase		
1.	Professional internships (240 hours)	At the end of the course, the student will be able to develop professional activities according to the graduate profile of the electromechanical engineering program to strengthen the essential skills in their profession through insertion in spaces according to their future work field.	**Specific educational content:** In this training space, the specific and transversal student outcome will be put into practice and strengthened **Learning activities:** Development of professional internships in a company in the productive and/or service sector. **Performance indicators:** The student… 1.1 Relates the physical phenomena to the theories and mathematical models that describe them. 1.2 Applies theoretical knowledge to solve complex engineering problems. 1.3 Applies knowledge of different areas of engineering to solve complex engineering problems. 1.4 Calculates the geometric dimensions and stresses of mechanical elements subjected to loads. 1.5 Applies the mathematical models of electromechanical components, such as motors, generators, transformers, pumps, hydraulic actuators, pneumatic actuators and compressors. 1.6 Identifies and calculates the different forms of energy involved in mechanical, electrical, thermal, pneumatic, hydraulic, etc. systems. 1.7 Interprets and produces mechanical, electrical, pneumatic, hydraulic and control diagrams using symbology according to standards. 1.8 Calculates components of systems of conversion, transmission and distribution of electrical energy. 1.9 Identifies and performs calculations for the integration of renewable energy systems. 1.10 Identifies opportunities and applies strategies for energy savings in electromechanical systems. 1.11 Implements preventive and corrective maintenance work in electromechanical systems. 1.12 Uses specialized software to analyze mathematical models that describe the behavior of electromechanical components or systems. 2.1 Applies a methodology for the design of a component, system or process. 2.2 Applies a methodology to weigh the technical, economic, environmental and social requirements that must be met by the design of a component, system or process. 2.3 Identifies and evaluates design constraints. 2.4 Applies a methodology for analysis and decision-making to design alternatives. 2.5 Establishes the technical, economic and environmental specifications that a component, system or process must meet.

			2.6 Identifies various electromechanical components that can meet the functional requirements of a system or process. 2.7 Identifies and selects the manufacturing processes necessary to build an electromechanical component or system. 2.8 Establishes the quality criteria of a product or process. 2.9 Calculates the direct and indirect costs of a project. 2.10 Evaluates the net present value and the internal rate of return of a project. 2.11 Makes a quote to sell engineering services. 2.12 Uses modern engineering devices to control and automate equipment or processes. 3.1 Has organized oral communication, being consistent with the central message and using appropriate body language to express one's ideas. 3.2 Has organized written communication, which must be consistent with the central message, identified in the introduction, where the main points are linked to transitions and a conclusion. 3.3 Uses modern presentation tools, such as audio, video, etc. effectively. 3.4 Uses extensive and appropriate vocabulary, as well as correct grammar. 3.5 Communicates orally and in writing in a language other than the first language. 3.6 Prepares technical reports where made judgments as products of the results of engineering solutions. 4.1 Identifies the facts and work methods considering ethical principles. 4.2 Rejects work that has the purpose of violating the general interest of society. 4.3 Avoids putting personal interests before the matters entrusted, or colluding to exercise unfair competition. 4.4 Safeguards the interests of the institution or persons and makes good use of the resources allocated for the performance of their activities. 4.5 Complies with society, attending to the welfare and progress of the majority. 4.6 Complies with the regulations to calculate, install and operate electromechanical systems. 4.7 Demonstrates responsibility and awareness of the consequences of his/her activities for society in general. 4.8 Understands of how economic factors affect professional practice. 4.9 Is aware of a variety of current events in a national and global context. 4.10 Selects the techniques and tools to give modern engineering solutions and makes judgments comparing the results with the alternative tools or techniques.

			4.11 Manages the human and material resources necessary to maintain the operation of electromechanical systems. 5.1 Contributes positively and widely to the work team. 5.2 Assumes responsibilities as a team member. 5.3 Expresses his/her ideas and concerns without fear. 5.4 Assumes leadership responsibilities. 5.5 Identifies the roles, responsibilities and expectations of leading a team. 5.6 Uses strategies to respond to disagreement, focusing on constructive conflict resolution and consensus building. 6.1 Identifies the need for experiments. 6.2 Selects the materials, devices and methods necessary to design experiments. 6.3 Uses a logical organization of procedures and applies mathematical and graphic analysis to interpret the results of an experiment. 6.4 Identifies in advance the problems that may arise in an experiment. 6.5 Describes the experimental results and their relationship with fundamental concepts and principles. 6.6 Develops a mathematical model from experimental data. 6.7 Uses modern and appropriate computing resources for engineering practice. 6.8 Uses and interprets results of materials and electrical equipment testing. 6.9 Applies techniques for acceptance testing and preventive maintenance of electromechanical equipment. 7.1 Recognizes the importance of learning and using sources different of information to prepare projects and reports. 7.2 Seeks to constantly improve their knowledge related to their profession. 7.3 Has the ability to learn through the selection of reliable information sources. 7.4 Has information of engineering state-of-the-art.

E. ASSESSMENT

The summative assessment proposal for the training space is shown below. According to it, students will receive an ordinary grade. This subject reports a single final grade and may be accredited (AC) or unaccredited (NA).

Table 1.

#	Time of evaluation	Proposal for the summative assessment of learning	Evaluation percentage
1.	At 80 h of activity.	A report of the activity that must be prepared in accordance with the guidelines and procedures of the training space. It will be evaluated according to a rubric provided by the teacher.	20 %

2.	At 160 h of activity.	A report of the activity that must be prepared in accordance with the guidelines and procedures of the training space. It will be evaluated according to a rubric provided by the teacher.	30 %
3.	At 240 h of activity.	A report of the activity that must be prepared in accordance with the guidelines and procedures of the training space. It will be evaluated according to a rubric provided by the teacher.	50 %

Ordinary final assessment	The ordinary grade will be the sum of the grade obtained at each evaluation moment multiplied by the evaluation percentage. If it is greater than 60 based on 100, the subject will be reported as AC, otherwise it will be NA. In order for the student to receive the ordinary qualification, it is essential that he/she performs the self-assessment of his/her performance in the professional practices. The student must also arrange for the external advisor to evaluate the student's performance.
Extraordinary assessment	This training space, due to the nature of its practical content, cannot be passed with an extraordinary exam, a proficiency exam or a regularization, so if the ordinary exam is not accredited, the course will have to be retaken.
Sufficiency assessment	This training space, due to the nature of its practical content, cannot be passed with an extraordinary exam, a proficiency exam or a regularization, so if the ordinary exam is not accredited, the course will have to be retaken.
Regularization assessment	This training space, due to the nature of its practical content, cannot be passed with an extraordinary exam, a proficiency exam or a regularization, so if the ordinary exam is not accredited, the course will have to be retaken.

F. BIBLIOGRAPHIC AND DIGITAL RESOURCES

BASIC TEXTS:

1. Sánchez Fernández María Dolores. Comunicación efectiva y trabajo en equipo. ISBN: 9788468161235, 9788468155135, PRINT ISBN: 9788468155135, E - ISBN: 9788468161235. EDITORIAL: Editorial CEP, S.L. 2014.
2. Shelton, Nelda - Burton, Sharon. Asertividad. ISBN: 9788416671366. PRINTISBN: 9788416671366. FC Editorial. 2017
3. Ley Federal del Trabajo. Diario Oficial Federación. Ultima Reforma 11 de enero de 2021. Disponible en: http://www.diputados.gob.mx/LeyesBiblio/pdf/125_110121.pdf

CURRICULAR AND SCHOOL DATA

Area	Line	Type of credit	Type of formation space	Language of instruction	Method of delivery
Deepening (Engineering Topics)	N/A	Elective	Internship	Spanish	In person

CREDITS

According to the official curricular proposal, the school data of the formation space are:

Semester	Number of weeks	Classroom hours per week	Contact hours of practice per week	Hours of autonomous student work per week	Credits per agreement 17/11/17(before 279)
10	Within a minimum 6, and maximum 12.	-	15	-	15

Note: This training space includes practical activities in the social or productive sector. The hours of dedication per week vary according to the availability of the student and the needs of the company. It is considered that the student must dedicate a minimum of 20 hours per week and a maximum of 40 hours. For this reason, the student can accumulate the 240 hours in a period of 6 to 12 weeks.

REQUIREMENTS TO ATTEND THE FORMATION SPACE

The school requirements for the formation space are noted below, if necessary

#	REQUIREMENTS
1.	This training space can be taken after having approved 315 credits and the mandatory training spaces up to level VI.

EQUIVALENCIES OF THE FORMATION SPACE

Next, the equivalences of the training space with spaces of previous educational programs are indicated, if necessary.

EQUIVALENCES
Professional Internships I

INTEROPERABILITY

This formation space is shared with other educational programs and/or academic entities: No.

ACADEMIC INSTITUTION AND EDUCATIONAL PROGRAMS
College of Engineering: Electromechanical Engineering

OTHER FORMS OF ACCREDITATION

- This formation space can be accredited through the presentation of a document certifying that the student has already acquired the necessary learning: **No**.

- This formation space can be accredited through an exam that certifies that the student has already acquired the necessary learning: **No**.

FORMATION OPTIONS

This formation space is part of the following options:

Training option	Yes/ No
Bachelor's Degree	Yes
Dual formation program	No

Higher University Technician	No
Executive career	No
Partial accreditation option	No
Residency or internship	No

TEACHER PROFILE

The teacher must know about the student outcomes that are promoted in the students of the electromechanical engineering program.

Formation and academic experience

- Electromechanical Engineer or related career with Master's or Doctorate studies.

Formation and professional and work experience

- Must have knowledge of the labor field of the electromechanical engineering graduate.

The teacher's role

- The teacher will have the task of exposing the guidelines and procedure to accredit the training space. It will monitor the practical activities carried out by the student by reviewing the reports. It will issue a grade on the student's report.
-

The external advisor.

- It will be the person in the company who is in charge of the student's activities. He will be in charge of signing the final report after review by the professor of the subject. He must make a final student evaluation.
-

MAXIMUM AND MINIMUM NUMBER OF STUDENTS PER GROUP

- Maximum number of students to guarantee academic, pedagogical, and financial viability: 20
- Minimum number of students to guarantee academic, pedagogical, and financial viability: 3

TYPE OF PROPOSAL

- It is a version of programs that are presented as a curricular adjustment of content within the framework of an existing educational program.

DEVELOPERS AND REVIEWERS

Developers of this programs	Reviewers of this programs
PhD. Baudel Lara Lara	
PhD. Francisco Oviedo Tolentino.	
MA. Vérulo Castro López	