


MATHEMATICS

1. Competences	To administer the process of products and services commercialization from a market diagnosis, sales strategies and administrative tools, in order to satisfy client needs, to contribute to corporation national and international competitiveness and positioning.
1. Term	First
2. Theoretical hours	18
3. Practical hours	57
4. Total hours	75
5. Weekly hours	5
6. Objective	Students will solve problems in commercial area, through the use of mathematical tools and methods to contribute to decision making in the corporation.

Learning Unit	Hours		
	Theoretical	Practical	Total
I. Basic operations	5	10	15
II. Algebraic identities and factorization	3	12	15
III. Ratio, proportion and variation	3	9	12
IV. Linear equations	3	12	15
V. Linear functions and graphs	4	14	18
Total	18	57	75


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Learning Units

1. Learning Unit	I. Basic operations
2. Theoretical Hours	5
3. Practical Hours	10
4. Total	15
5. Objective	Students will solve basic operations with algebraic expressions to develop analytical thinking abilities.

Topic	Knowledge	Skills	Values/ Behavior
Real numbers	To identify real numbers and their properties: - Associative - Commutative - Distributive	To solve basic operations with real numbers considering their properties.	Analytical Disciplined Organized Reasoning Patient
Law of signs	To identify the signs and their laws in real numbers.	To solve basic operations with real numbers applying the law of signs.	Analytical Disciplined Organized Reasoning Patient
Exponential notation	To identify the use of exponential notation and laws of exponents.	To solve operations where exponential notation and laws of exponents apply.	Analytical Disciplined Organized Reasoning Patient
Algebraic expressions	To identify the components of algebraic expressions.	To determine the value of algebraic expressions.	Analytical Disciplined Organized Reasoning Patient


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Topic	Knowledge	Skills	Values/ Behavior
Operations with algebraic expressions	To identify rules for operation solution with algebraic expressions: - Additions - Subtractions - Multiplications - Divisions	To calculate operations with algebraic expressions.	Analytical Disciplined Organized Reasoning Patient

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ASSESSMENT PROCESS

Learning Outcome	Learning Process	Assessment Instruments
<p>To integrate a file with practices including 10 exercises about:</p> <ul style="list-style-type: none"> - Real numbers - Law of signs application - Exponential notation - Algebraic expressions - Operations with algebraic expressions 	<ol style="list-style-type: none"> 1. To understand real numbers and its properties. 2. To understand the law of signs. 3. To identify the Exponential notation 4. To solve operations with algebraic expressions. 	<p>Practical exercises</p> <p>Checklist</p>

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TEACHING-LEARNING PROCESS

Teaching Methodologies	Teaching Materials
Problem solving Collaborative teams	Board Printed material: books, exercises list Projector Computer Calculator

TRAINING FACILITIES

Classroom	Languages Lab/Workshop	Corporation
X		


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Learning Units


1. Learning Unit	II. Algebraic identities and factorization
2. Theoretical Hours	3
3. Practical Hours	12
4. Total	15
5. Objective	Students will solve factorization algebraic expressions to contribute to decision making.

Topic	Knowledge	Skills	Values/ Behavior
Algebraic identities	To identify algebraic identities and their rules: - Square binomial - Conjugated binomial - Binomials with common factor	To develop algebraic identities.	Analytical Disciplined Organized Reasoning Patient
Factorization	To identify factorization algebraic expressions and their rules: - Common factor - Square difference - Perfect square trinomial - Trinomial with the structure ax^2+bx+c	To factorize algebraic expressions reducing them to their minimal expression.	Analytical Disciplined Organized Reasoning Patient

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ASSESSMENT PROCESS

Learning Outcome	Learning Process	Assessment Instruments
<p>To deliver a practices file including:</p> <ul style="list-style-type: none"> - 5 square binomial exercises - 5 conjugated binomial exercises - 5 binomials with common factor - 15 algebraic expressions with factorization 	<ol style="list-style-type: none"> 1. To understand algebraic identities and their rules. 2. To understand factorization rules in algebraic expressions. 3. To solve algebraic expressions applying factorization. 	<p>Practical exercises</p> <p>Checklist</p>

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Learning Units

1. Learning Unit	III. Ratio, proportion and variation
2. Theoretical Hours	3
3. Practical Hours	9
4. Total	12
5. Objective	Students will relate variables in commercial area for problem solving.

Topic	Knowledge	Skills	Values/ Behavior
Variables clearing	To identify the concept of variable and its rules.	To perform variable clearing operations.	Analytical Disciplined Organized Reasoning Patient Decision making
Ratios	To describe the concept of ratio and its importance in businesses.	To establish ratios.	Analytical Disciplined Organized Reasoning Patient Decision making
Proportion	To identify the concept of proportion, types and characteristics: - Direct - Inverse	To calculate proportions.	Analytical Disciplined Organized Reasoning Patient Decision making


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Topic	Knowledge	Skills	Values/ Behavior
Direct and inverse variation	To identify the concept of variation, its types and characteristics: - Direct - Indirect To understand the importance of variation in decision making.	To solve exercises of direct and inverse variation.	Analytical Disciplined Organized Reasoning Patient Decision making

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ASSESSMENT PROCESS

Learning Outcome	Learning Process	Assessment Instruments
<p>To deliver a practices file including:</p> <ul style="list-style-type: none"> - 5 ratio problems - 5 proportion problems - 5 variation problems - 3 cases related to businesses applying the concept of variation. 	<ol style="list-style-type: none"> 1. To understand the concept of ratio and its importance in businesses. 2. To understand the concept of clearing and its rules. 3. To understand the concept of proportion and variation, its types and characteristics. 4. To understand the importance of variation in decision making. 5. To solve variation problems. 	<p>Practical exercises</p> <p>Checklist</p>

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Learning Units

1. Learning Unit	IV. Linear equations
2. Theoretical Hours	3
3. Practical Hours	12
4. Total	15
5. Objective	Students will resolve linear equation systems to solve problems.


Topic	Knowledge	Skills	Values/ Behavior
Linear equation with one unknown	<p>To identify the concept of linear equation.</p> <p>To identify the concept of linear equation with one unknown and its elements.</p>	To solve linear equations.	<p>Analytical</p> <p>Disciplined</p> <p>Organized</p> <p>Reasoning</p> <p>Patient</p> <p>Decision making</p>
Linear equation systems with two unknowns	<p>To distinguish linear equation systems with two unknowns:</p> <ul style="list-style-type: none"> - Sums and subtractions - Substitution 	To solve linear equation systems with two unknowns.	<p>Analytical</p> <p>Disciplined</p> <p>Organized</p> <p>Reasoning</p> <p>Patient</p> <p>Decision making</p>

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<p>To deliver a practices file in business and marketing areas, including:</p> <ul style="list-style-type: none"> - 5 linear equation problems - 10 problems of linear equation systems with two unknowns: <ul style="list-style-type: none"> o 5 substitution and o 5 sums and subtractions 	<ol style="list-style-type: none"> 1. To understand the concept of linear equation. 2. To understand the concept of linear equation with one unknown and its elements. 3. To identify linear equation systems with two unknowns. 4. To solve practical cases with linear equations 	<p>Practical exercises</p> <p>Checklist</p>

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Learning Units


1. Learning Unit	V. Linear functions and graphs
2. Theoretical Hours	4
3. Practical Hours	14
4. Total	18
5. Objective	Students will interpret linear functions to determine variables behavior.

Topic	Knowledge	Skills	Values/ Behavior
Linear function	<p>To describe the concept of function and linear function.</p> <p>To identify the elements of linear function.</p> <p>To disclose models of linear function.</p>	To solve linear functions.	<p>Analytical</p> <p>Disciplined</p> <p>Organized</p> <p>Reasoning</p> <p>Patient</p> <p>Decision making</p>
Graphs	To identify the elements of a graph.	<p>To plot linear functions.</p> <p>To interpret linear functions graphs.</p>	<p>Analytical</p> <p>Disciplined</p> <p>Organized</p> <p>Reasoning</p> <p>Patient</p> <p>Decision making</p>

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<p>From a case related to business or commercial area, to elaborate a report containing:</p> <ul style="list-style-type: none"> - Linear function - Graph, analysis and interpretation 	<ol style="list-style-type: none"> 1. To understand the concept of function. 2. To understand the concept of linear function and its elements. 3. To identify the models of linear function. 4. To identify the elements in a graph. 5. To solve linear functions. 	<p>Practical exercises</p> <p>Checklist</p>

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ABILITIES DERIVED FROM PROFESSIONAL COMPETENCIES TO WHICH THE SUBJECT CONTRIBUTES

Ability	Performance Criteria
<p>To diagnose the corporation situation through the use of financial, administrative and researching tools, as well as to analyze functional areas, in order to plan commercialization process.</p>	<p>Students perform a diagnosis of the corporation including:</p> <ul style="list-style-type: none"> - Organizational philosophy - Organizational objectives - Financial analysis: <ul style="list-style-type: none"> - Vertical method <ul style="list-style-type: none"> * Financial reasons * Integral percentages * Critical point - Horizontal method <ul style="list-style-type: none"> *Tendencies * Percentage variations - Installed capacity - Positioning in the market - Product analysis - Distribution channels - Competitiveness of sales force - Client portfolio behavior - Public perception - Identification of strengths and weaknesses.
<p>To establish competition positioning through the study of its competitive advantages, weaknesses, use of methods and techniques, in order to identify corporation's opportunities in the market.</p>	<p>Students deliver an analysis of competition, containing:</p> <ul style="list-style-type: none"> - Participation in the market - Positioning in the market - Competitive and comparative advantages matrix: <ul style="list-style-type: none"> - Price, - Product quality, - Service quality, - Distribution channels, - Delivery time, - Publicity, - Payment terms, - After-sales service - Results analysis and interpretation - Opportunities Detection


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Ability	Performance Criteria
To do national and international market research by an environment analysis and the use of quantitative and qualitative methods, for commercial decision making.	Students present a report on the market research, containing: <ul style="list-style-type: none"> - Executive overview - Research approach (problem, objective, hypothesis, research methodology, technical proposal, tool for data gathering) - Data gathering and management - Results analysis and interpretation - Conclusions y recommendations
To formulate national and international business ideas through business projects methodology, to harness detected opportunities.	Students present a draft at a profile level containing: <ul style="list-style-type: none"> Executive overview Definition of goods or service Market analysis Technical analysis: <ul style="list-style-type: none"> - Organizational - Legal - Production - Environmental impact Financial analysis Pre-feasibility analysis Conclusions
To elaborate sales programs based on sales projections and through resources analysis and strategies design, to achieve commercial goals.	Students elaborate a sales program containing: <ul style="list-style-type: none"> - projection - objectives - goals - strategies - budgets - activities timetable

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De Oteyza, Elena: et al	2011	<i>Álgebra</i>	Ciudad de México	México	Prentice Hall Pearson ISBN: 9789702611325
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