Universidad Juárez del Estado de Durango
Facultad de Ciencias Forestales

Learning Unit Programme
With an integral professional competences approach

I. LEARNING UNIT GENERAL DATA

1. learning Unit Name		2. Code	
Math		4220	

3. Academic Unit
FORESTRY SCIENCES FACULTY

4. Academic programme	5. Level
Environmental Management Engineering	bachelor's degree

6. Training Area
Discipline.

7. Academy
ACADEMY OF BASIC AND METHODOLOGICAL SCIENCES.

8. Modality					
Mandatory	x	**Course**		**Attendance**	
Elective		**Course-workshop**		**Non-attendance**	
		Workshop		**Mixed**	
		Seminar			
		Laboratory, field practice, etc.			
		Professional Practice			
		Academic Stay			

9. Pre-requirements
Have approved the examination of admission to the faculty of forest sciences / previous course.

10. Theory hours	Practice hours	Independent study hours	Total hours	Credits

5	0	0	5	5

11. Names of the teachers who participated in the development and/or modification of the programme

Mr. Ismael Compean-Guzmán

12. Date of development	Date of modification	Date of approval
11/08/2014	25/01/2016	08/02/2016

II. LEARNING UNIT SPECIFIC DATA
13. Presentation
The thematic content of MATHEMATICS of the environmental management engineer's curricular map is structured so that the student progressively, easily and guided, acquire, exercise and increase the necessary capacities to achieve the objective of the learning unit, through the dynamics of the approach , resolution of exercises in class, guided discussion of doubts, answering and sending assignments, research on the internet and analysis of mathematical educational videos of application in the environmental area.
14. Integral professional competences to develop in the student

Generic competences	- Instrumental - Oral and written communication skills - Problem resolution - Personal - Teamwork - Ethical and quality commitment - Systemic - Motivation for quality - Ability to apply theoretical knowledge in practice
Professional competences	- Disciplinary (know) - Capability for quantitative interpretation of data - Professionals (know how) - Development, management, monitoring and control of environmental projects - Preparation and execution of environmental impact studies

General purpose of the course	The student will be able to handle the techniques and procedures for the solution of basic algebraic problems; awaken the logic and apply the mathematical language, the systematization of information and the forms of graphic and analytical representation, managing the knowledge, methods and mathematical algorithms established as an objective of the learning unit itself, as well as to address the contents of other learning units within the curricular map of Environmental Management Engineering as well as in the professional field of the Consultancy and evaluation of the environmental impact.

15. Joint of axes

Environmental, human rights research given its purpose and content.

16. development of the course

Module 1	Algebra

Intended learning	Learning contents	Learning product(s)	Strategies	Teaching resources and materials
That the student develops the ability to solve algebra problems by applying Mathematical reasoning and basic arithmetic and algebraic concepts inside and outside the field of environmental engineering.	Introducing Basic Algebraic operation Signs of grouping Algebraic division Factoring	• Career analysis document • Engineer in environmental management. • Exercise solved in notebook • Task digitalized and sent • through educational platform of the Forestry Sciences Faculty	• Collaborative learning, • problem-based learning, • task-based learning, • through: Class • presentation, solving class • examples, solving • homework problems, • observing educational • video of the topic at home • for reinforcement	• Common classroom materials • FSF Library • Central University Library E-literature • Computer equipment, projector, smart board, board. • educative platform • Moodle, internet service.

				• educational videos of the area of mathematics.
Module 2	Algebra and Euclidian Geometry			
Intended learning	**Learning contents**	**Learning product(s)**	**Strategies**	**Teaching resources and materials**
That the student develops the ability to solve algebra problems by applying resolution of equations of different degrees inside and outside the field of environmental engineering, as well as identifying formulas for the calculation of areas and volumes.	Exponents, Radicals and logarithms System of first degree equations Areas, volumes and properties of geometric figures	Exercise solved in notebook and Task digitized and sent through educational platform of the Forestry Sciences Faculty.	Research-based learning by consulting the requested concepts; both in bibliography in printed and digital media; visualization of educational videos of the theme.	Common classroom materials FSF Library Central University Library E-literature Computer equipment, projector, smart board, educational platform FSF, internet service, educational videos of the area of mathematics.
Module 3	ANALYTIC GEOMETRY			
Intended learning	**Learning contents**	**Learning product(s)**	**Strategies**	**Teaching resources and materials**
That the student knows	Properties of the Circle, cylinder, parallelepiped.	Document containing the characteristics, forms, equation and application of	• Task-based learning, • Research-based learning by • consulting the requested	Common classroom materials

and contrasts the shapes of the figures and identifies their equation for its application in the solution of real problems within environmental management.	Properties of the Circumference	each of the figures.	concepts; both in bibliography in printed and digital media;	• FSF Library Central University
	Properties of the Parabola.		• visualization of educational videos of the theme.	• Library E-literature
				• Computer equipment, projector,
	Properties of the Ellipse.			• smart board, paintbrush,
				• FSF educational platform,
				• internet service, educational videos of the area of mathematics

Module 4	Differential and Comprehensive Calculation.			
Intended learning	**Learning contents**	**Learning product(s)**	**Strategies**	**Teaching resources and materials**
That the student applies the differential and integral calculus in the solution of problems typical of the	Variables functions and limits..	Problem solving presentation Portfolio of evidence Integrative project as final product.	• Strategy: Problem solving. • Exhibition of the different • topics that involve • differential and integral • Apply the theorems and • axioms of differential and • integral calculus to solve • problems • Collaborative work to solve	• Common classroom materials. • FSF Library • Central University Library. • E-literature Computer • equipment, projector, • smart board,
	Derivation by increments			
	Derivation by formulas			

different disciplines of Environmental Engineering.	Implicit derivatives.		Problems.	• paintbrush, • FSF educational platform, • internet service, educational videos of the area of mathematics.
	Differentials			
	Integration by formulas.			
	Defined Integral.			

17. Performance assessment:				
Performance evidence(s)	**Performance criteria**	**Application scopes**		**percentage**
Diagnostic examination.	Regional Algebraic exercises solved correctly by the student on paper individually.	- Local - Regional - National - International		No value
First evaluation Written exam, individual 10 tasks containing algebraic exercises.	Regional Algebraic exercises solved correctly by the student on paper individually.	- Local - Regional - National - International		50% Formative. 30% Summative 5% Self-evaluation 10% Co-evaluation 5% Heteroevaluation 100% Sum
Second partial written evaluation, individual 11 tasks containing algebraic exercises.	Regional Algebraic exercises solved correctly by the student on paper individually.	- Local - Regional - National - International		
third written partial evaluation, individual 3 tasks containing algebraic exercises.	Regional Algebraic exercises solved correctly by the student on paper individually.	- Local - Regional - National - International		

| Fourth Assessment written document, individual | • Description of figures ellipse,
 • circumference, parabola, hyperbola.
 • Equations, examples | - Local
 - Regional
 - National
 - International | |

18. Evaluation criteria:

Criterion	Value
Formative Evaluation	50% value of the qualification is evidence of responsibility, commitment, ethical values.
Summative evaluation	Value 30% of the grade is the evidence of performance and learning products displayed by the student.
Self-evaluation	Value 5% of total final grade, the student will be evaluated in comparative through the programme and achievement
Co-evaluation	Value 10.0% of final total score, made between pairs.
Heteroevaluation	5% The evaluation of the teacher towards the student with the described quantifications; from the student to the teacher, through the surveys answered by the student.
Criteria summation	**100%.**

19. accreditation

The Learning unit is accredited, if the student presents all the evidences of performance. Course attendance must be greater than 80%
The minimum probationary grade is 60.

20. Information sources

| **Basic** | • BALDOR, Aurelio. (2017). Algebra (third edition). Mexico, Editorial Patria
 • BALDOR, J. Aurelio. (1988). Plane and Space Geometry and Trigonometry (First edition, fourth reprint). Mexico: Publicaciones Cultural, SA.
 • GUZMAN, A. (2004). Geometry and trigonometry. (Fourth edition). Mexico, Cultural Publications.
 • LEHMAN, Charles H. (1980). Analytical Geometry (First edition). Mexico, Editorial Limusa
 • ORTIZ F. (2005). Geometry and trigonometry. (Second edition). Mexico, Cultural Publications. |

	• GELTNER, Peter B. / Peterson Darrel J. (1999), Geometry. Mexico, Ed. Thomson Editores. • CLEMENS STANLEY, R, and G. O'Daffer Phares (1998). Geometry, Ed. Pearson Education. • FUENLABRADA DE LA VEGA, Trucios Samuel, (2000). Geometry and Trigonometry, Ed. McGraw Hill. • GUZMÁN HERRERA, Abelardo (2000). Geometry and Trigonometry, Ed. Cultural Publications. • GRANVILLE, WILLIAM ANTONY (2008). Differential and Integral calculus (First edition). Mexico, LIMUSA
Complementary	• HEMMERLING, E. (1988). Elementary Geometry (First edition). Mexico: Editorial Limusa. • CLEMENS, S. (1998). Geometry. (First edition). Mexico: Prentice Hall. • CLEMENS STANLEY, R, and G. O'Daffer Phares (1998). Geometry. Mexico, Ed. Pearson Education. • AAYRES, JR FRANK (2005). Differential and Integral Calculus (Fifth Edition). Mexico, Editorial Mc Inter-American Graw-Hill. Websites http://miprofesordematematicas.com/ http://academatica.com http://mathtome.com http://www.academiavasquez.com/ http://cursodealgebra.net

21. Profile for the teacher who imparts this learning unit

Bachelor's degree in Mathematics, Engineering or Bachelor's degree, with master's level, expert in mathematics with mastery in teaching.