General information	
Academic subject	*Integrated teaching course of Mathematics and Statistics* *Module: MATHEMATICS*
Degree course	*Agricultural Sciences and Technologies (STA)*
Academic Year	*I*
European Credit Transfer and Accumulation System (ECTS)	*6 ECTS*
Language	*Italian*
Academic calendar (starting and ending date)	*I semester 18/10/2021 - 28/01/2022*
Attendance	*no*

Professor/ Lecturer	
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Department and address	*Dip. DiSAAT University of Bari, Via G. Amendola 165 / a* *Old plexus, section of Rural Buildings, First floor, Second door on the right.*
Virtual headquarters	*Microsoft Teams: nxdzt9f*
Tutoring (time and day)	Tuesday and Thursday from 9.00 to 11.00 at the university office and / or online with Microsoft Teams

Syllabus	
Learning Objectives	*Acquire an adequate basic knowledge of Mathematics by means of algebraic, matrix and differential calculus, knowledge of trigonometry, the study of real functions in the Cartesian plane*
Course prerequisites	*Notions of elementary mathematics*
Contents	*Natural numbers. Rational numbers. Irrational numbers. Real numbers.* *Polynomials. Definition. Operations.* *Algebraic equations. Definition. Equations of 1st and 2nd degree.* *1st degree systems of equations* *Integer rational inequalities. Rational inequalities of 1st and 2nd degree. Fractured rational inequalities.* *Notes on matrices.* *Coordinate method. Oriented lines and segments. Abscissa on the straight line.* *Elementary measurement of angles. Oriented bundles of straight lines.* *Measurement of oriented angles. Cartesian coordinates of the plane. Distance of two points. Coordinates of the midpoint of a segment.* *Elements of trigonometry.* *Explicit and implicit Cartesian equation of the straight line. System of 2 lines. Beam of straight lines passing through a point. Bundle of parallel lines. Line through a point and parallel to a given line. Condition of perpendicularity. Geometric meaning of the angular coefficient of a straight line.* *Cartesian equation of the circumference, ellipse, hyperbola and parabola.* *Numeric sets. Intervals. Surroundings.* *Real function of a variable of a real variable. Set of existence of a function. Geometric representation of a function.* *Definition of finite limit for a function at one point. Left and right limit. Definition of infinite limit for a function at one point. Definition of limit for a function at infinity.* *Monotone functions.*

	Continuous functions. Function function. Reverse function. Inverse functions of circular functions. Natural logarithms.
	Derivatives of the functions of a variable and its geometric meaning. Derivative of some elementary functions. Derivation of function functions. Higher-order derivatives.
	Fundamental theorems of differential calculus: Rolle's theorem; Lagrange or mean value theorem.
	Maximums and minimums relative and absolute. Concavity, convexity and inflection of plane curves. Asymptotes. Study of the graph of a function y = f (x).
Books and bibliography	*G. Zwirner, Istituzioni di matematiche, CEDAM Editore, Padova 1994*
	G. Malafarina, Matemativa per i precorsi, McGraw Hill, Milano 2010
	Both texts are of reference, both for the theoretical and practical aspects.
Additional materials	*Notes of the lessons*

Work schedule			
Total	Lectures	Hands on (Laboratory, working groups, seminars, field trips)	Out-of-class study hours/ Self-study hours
Hours			
150	*32*	*16*	*90*
ECTS			
17.25	*4 CFU*	*2 CFU*	*11.25*
Teaching strategy			
	The topics of the course will be treated with the help of Power Point presentations Upon request, E-learning can be used with public platforms (eg Teams) and dedicated (Agripodcast), such as learning facilities for students with disabilities and for working students, student athletes and students with children		
Expected learning outcomes			
Knowledge and understanding on:	o Knowledge of mathematical concepts necessary for other disciplines, such as mechanics, construction, economics, agronomy, etc.		
Applying knowledge and understanding on:	o Ability to apply mathematical algorithms for the solution of typical problems of the STA graduate		

Soft skills	• *Making informed judgments and choices*
	 o Ability to evaluate and choose the most suitable methodologies for solving mathematical problems
	 • *Communicating knowledge and understanding*
	     o Ability to evaluate and choose the most suitable methodologies for solving mathematical problems
	     o *Ability to use mathematical terminology appropriately*
	 • *Capacities to continue learning*
	 o Ability to learn new mathematical concepts based on the knowledge acquired during the course.		

Assessment and feedback	
Methods of assessment	*An exemption test is organized for students enrolled in the course year in which the teaching is carried out. The exemption consists of a written test on the topics developed during the theoretical lesson hours held up to the date of the exemption. The outcome of this test contributes to the evaluation of the final exam and is valid for one academic year. The evaluation of the students'*

	achievement is expressed with a mark out of thirty. The exemption test is passed with a score of at least 18/30. *The exam consists of a written test on the topics developed during the theoretical lesson hours. The evaluation of the students' achievement is expressed with a mark out of thirty. The test is passed with a score of at least 18/30.* *For students who took the exemption test, the evaluation of the final exam is expressed as the average of the marks obtained in the two written tests. In the case of maximum marks (30/30), honors can be attributed.* *The oral tests are public.* *The assessment of the student's preparation takes place on the basis of pre-established criteria, as detailed in Annex A of the Didactic Regulations of the Degree Course in Agricultural Sciences and Technologies.* *The exam for foreign students can be done in English.*

Evaluation criteria	• *Knowledge and understanding*
	  o The knowledge and understanding of the theoretical mathematical concepts illustrated during the course will constitute the elements for the basic evaluation of the student.
	• *Applying knowledge and understanding*
	  o A further element of evaluation will be the ability to apply theoretical concepts for the solution of exercises and practical problems.
	• *Autonomy of judgment*
	  o The ability to choose the most suitable methodology for solving mathematical exercises will constitute another essential element of evaluation
	• *Communicating knowledge and understanding*
	  o xxxxxxxxxxxxxx
	• *Communication skills*
	  o A further element of evaluation will be the student's ability to express and explain the theoretical concepts learned and the solution methodologies adopted.
	• *Capacities to continue learning*
	  o The ability to learn new mathematical concepts based on the knowledge acquired will ultimately highlight the highest level of learning.

Criteria for assessment and attribution of the final mark	*The assessment of knowledge and understanding takes place through written and oral or oral exams during which questions are asked relating to the theoretical-practical aspects of the disciplines aimed at verifying the knowledge acquired and the ability to apply them to problems of a practical nature.* *The student has the opportunity to take intermediate assessment tests (so-called exemptions), for each course conducted in the same way as the exams. The evaluation of students' performance takes place on the basis of pre-established criteria which include: a) consistency with the topics of the program, b) the quality of the discussion, c) the ability to analyze, d) the level of structuring of the arguments. The measure of performance follows the scheme shown in the degree course program regulations*
Additional information	
Prerequisites	The exam of the Integrated Course: Mathematics and elements of statistics, must be taken before the C.I. Agro-industrial buildings and Hydraulics or the I.C. Rural Construction and Hydraulics, and Agricultural Mechanics and Mechanization.