General Information	
Academic subject	Mathematics
Degree course	Agricultural Technologies and Science (STA)
Curriculum	all
ECTS credits	6
Compulsory attendance	No
Language	Italian

Subject teacher	Name Surname	Mail address	SSD
	Simone Pascuzzi	simone.pascuzzi@uniba.it	AGR09

ECTS credits details			
Basic teaching activities	Agricultural, Forestry and Biosystem Engineering		

Class schedule	
Period	First semester
Year	2017-2018
Type of class	Lecture- workshops

Time management	
Hours	150
In-class study hours	60
Out-of-class study hours	90

Academic calendar	
Class begins	2nd october 2017
Class ends	26th january 2018

Syllabus	
Prerequisites/requirements	Basic elements of mathematics
Expected learning outcomes (according to Dublin Descriptors) (it is recommended that they are congruent with the learning outcomes contained in A4a, A4b, A4c tables of the SUA-CdS)	*Knowledge and understanding* o Knowledge of mathematical concepts needed for other disciplines such as mechanics, constructions, agronomy economics, and so on. *Applying knowledge and understanding* o Ability to apply mathematical algorithms for solving typical problems of a graduate in STA. *Making informed judgements and choices* o Ability to evaluate and choose the most appropriate methodologies for solving math problems. *Communicating knowledge and understanding* o Ability to explain the chosen and employed resolution methods. *Capacities to continue learning* o Ability to learn new mathematical concepts based on the knowledge gained during the course. The expected learning outcomes in terms of knowledge and abilities are reported in Annex A of the Academic Regulations (expressed through the European descriptors pertinent to the degree program)
Contents	

	Natural numbers. Rational numbers. Irrational numbers. Real numbers. **Polynomials**. Definition. Operations. **Algebraic equations**. Definition. First degree equations. Quadratic equations. **Inequalities**. Integer rational inequalities. Rational first degree inequalities. Rational quadratic inequalities. Fractional rational inequalities. **Notice about the matrix**. **Principles connected to the coordinates**. Lines and segments. Abscissa on the line. Elementary measurement of the angles. Directed bundles of straight lines. Measurements of directed angles. Cartesian coordinates of the plane. Distance between two points. Coordinates of the midpoint of a segment. **Principles of trigonometry**. **Equation of a straight line**. Cartesian equation of a straight line. Explicit equation of a straight line. Bundle of straight lines passing through a point. Bundle of parallel straight lines. Equation of a straight line passing through a point and parallel to another given straight line. Condition of perpendicularity. Geometric significance of slope of a line. **Algebraic quadratic curves**. Cartesian equation of the circumference. Ellipse. Hyperbola. Parabola. **Notice about numerical sets**. Numerical set. Intervals. Neighborhood of a number. **Real function of one real variable**. Domain of a function. Geometric representation of a function. **Limits of one variable function**. Statement of the limit of function as x approaches a (a finite). Right and left limit of a function. Statement of the infinite limit of function as x approaches a (a finite). Statement of the limit of function when x increases without bound. Operations with limits. **Monotonic functions**. **Continuous functions**. Continuous function as x approaches a (a finite). Examples of continuous functions. Continuous function over a range. Function of a function. Inverse function. Inverse functions of circular functions. Natural logarithms. **Derivatives of one variable functions**. Statement of the derivative and its geometric significance. Derivatives of some elementary functions. The derivatives of the functions of a function. Higher derivatives. **Fundamental theorems related to differential calculus**. Rolle's theorem. Lagrange's theorem or mean value theorem. **Relative and absolute maximum and minimum**. **Study of the y=f(x) function graph**. Concavity, convexity and flex of the plane curves. Asymptotes..
Course program	
Bibliography	o G. Zwirner, Istituzioni di matematiche, CEDAM Editore, Padova 1994 o G. Malafarina, Matemativa per i precorsi, McGraw Hill, Milano 2010

Notes	The aforesaid texts are of reference, both for theoretical and practical aspects.
Teaching methods	The course topics will be explained through Power Point presentations.
Assessment methods (indicate at least the type written, oral, other)	A partial check is planned for students ongoing with the course year in which the teaching is carried out. This check consists of a written test pertinent to topics developed during the theoretical lessons and exercise carried out until the date of the check. The outcome of this check contributes to the evaluation of the final attainment and is valid for one academic year. The evaluation of the students' accomplishment is expressed by a vote of thirty. The partial check is passed with a vote of at least 18/30. The final exam consists of a written test concerning the topics developed during the theoretical and practice lessons. The evaluation of the students' accomplishment is expressed by a vote of thirty. The final exam is passed with a vote of at least 18/30. For students who were undergone the partial check, the final evaluation is expressed by the average of the votes obtained in the two oral tests. A first class degree can be attributed in the case of top vote (30/30). The oral examinations are public. The evaluation of the student's attainment is in agreement with pre-established criteria, as detailed in Annex A of the Academic Regulations for the Agricultural Technologies and Science Degree Course.
Evaluation criteria (Explain for each expected learning outcome what a student has to know, or is able to do, and how many levels of achievement there are.	*Knowledge and understanding* o The knowledge and understanding of the math concepts explained during the Course will be the basic elements for the student's assessment.. *Applying knowledge and understanding* o An additional element of assessment will be the ability to apply the theoretical concepts for solving exercises and operative problems. *Making informed judgements and choices* o The ability to choose the most appropriate methodologies for solving math problems will be another essential element of assessment. *Communicating knowledge and understanding* o A further element of assessment will be the student's ability to explain and motivate the chosen and employed resolution methods. *Capacities to continue learning* o The ability to learn new mathematical concepts based on the knowledge gained during the course will finally highlight the highest level of learning.
Further information	