Course Title	**Mathematics |**				
Course Code	**MAS001**				
Course Type	Compulsory				
Level	Undergraduate				
Year / Semester	Year 1/Semester 1				
Teacher's Name					
ECTS	6	Lectures / week	2 (3hours)	Laboratories / week	1(1hour)
Course Purpose and Objectives	To understand calculus and to use basic methods to solve real problems.				
Learning Outcomes	- Solve linear equations - Knowledge of simple concepts of Analytical Geometry - Knowledge of the concept of the function and the basic functions - Calculate basic limits and understanding the notion of continuity of a function - Understanding the notion of differentiation and to differentiate basic functions - Apply the knowledge of the notion of differentiation to real problems - Understanding the notion of the integral - Knowledge of the methods of integration				
Prerequisites		Required			
Course Content	**Introduction** Real numbers – Inequalities – Absolute value – Equation of a straight line, circle and parabola **Functions** Kinds of functions – Graph of a function – Inverse function – inverse trigonometric functions – Exponential and Logarithmic functions - **Limit and Continuity** Limit of a function – Continuity of a function - Intermediate-Value Theorem – Limits and Continuity trigonometric, Exponential and Logarithmic functions **The Derivative** The derivative function – techniques of differentiation – Implicit differentiation- differentiation of inverse function – parametric equations				

	Applications of the Derivative Increasing and decreasing functions – Relative extrema – Absolute extrema - Graphing of a function – Newton's method – Rolle's theorem – Mean value theorem **Integration** The indefinite integral – the definite integral – the fundamental theorem of calculus – Average value of a function **Principles of integral evaluation** Integration by parts – integration by substitution – integration of rational functions by partial fractions
Teaching Methodology	
Bibliography	**1.** CALCULUS (7th Edition), by H. Anton, I. Bivens, S. Davis, John Willey & Sons, 2003 **2.** Thomas' Calculus (10th Edition), by G. B. Thomas, R. L. Finney, M. D. Weir, F. R. Giordano, Pearson Addison Wesley, 2000 **3.** Calculus with Analytic Geometry, by H. C. Edwards, D. E. Penney, Prentice Hall, 1997 **4.** Calculus with analytic geometry, 4th ed., by R. Ellis, D. Gulick, Harcourt Brace Jovanovich, 1990 Calculus with analytic geometry, 2nd ed., by D. G. Zill, PWS-KENT Publishing Company, 1998
Assessment	Mid-term exams and Final exam
Language	Greek

Course Title	Mathematics ||				
Course Code	MAS002				
Course Type	Compulsory				
Level	Undergraduate				
Year / Semester	Year 1/Semester 2				
Teacher's Name					
ECTS	6	Lectures / week	2 (3hours)	Laboratories / week	1(1hour)
Course Purpose and Objectives	To understand calculus and to use basic methods to solve real problems. Basic knowledge of Linear Algebra				
Learning Outcomes	- Applications of definite integrals - the concept of improper integral - evaluation of limits with the use of L' Hopital rule - the concept of sequence and evaluation of sequence limits - evaluation of basic series and knowledge of convergence tests for series. Similarly, for power series - solve simple first order differential equations - solve linear second order differential equations - solve linear systems - the concept of matrix and determinant - the definition of vector space - the concept of linear independence - to determine eigenvalues and eigenfunctions				
Prerequisites		Required			
Course Content	**Applications of integrals** Area between two curves – volumes by slicing- volumes by cylindrical shells – length of a plane curve – area of surface revolution **Improper integrals** **L' Hopital rules** **Sequencies** **Infinite series** Convergence tests – alternating series				

	Power series Maclaurin and Taylor series – convergence – differentiation and integration of power series **Differential equations** First order differential equations – Second order linear differential equations **Linear Algebra** Systems of linear systems – Matrices -Determinants – Vectors – Vector spaces – Eigenvalues and eigenfunctions
Teaching Methodology	
Bibliography	**1.** CALCULUS (7th Edition), by H. Anton, I. Bivens, S. Davis, John Willey & Sons, 2003 **2.** Thomas' Calculus (10th Edition), by G. B. Thomas, R. L. Finney, M. D. Weir, F. R. Giordano, Pearson Addison Wesley, 2000 **3.** Calculus with Analytic Geometry, by H. C. Edwards, D. E. Penney, Prentice Hall, 1997 **4.** Calculus with analytic geometry, 4th ed., by R. Ellis, D. Gulick, Harcourt Brace Jovanovich, 1990 **5.** Calculus with analytic geometry, 2nd ed., by D. G. Zill, PWS-KENT Publishing Company, 1998 **6.** H. Anton and C. Rorres, *Elementary Linear Algebra*, 6th edition, Wiley, 1991 S.F. Andrilli and D. Hecker, *Elementary Linear Algebra*, 3rd ed., Elsevier Academic Press, 2003
Assessment	Mid-term exams and Final exam
Language	Greek

Course Title	Complex Analysis for Physicist.				
Course Code	MAS 003				
Course Type	Service course Offered for students of other departments.				
Level	undergraduate				
Year / Semester	3/6				
Teacher's Name					
ECTS	5	Lectures / week	2 lectures of 75 minutes each	Laboratories / week	1 meeting (50 minutes)
Course Purpose and Objectives	To introduce students to basic facts and methods of Complex Analysis and illustrate the applications of its fundamental principles to sciences.				
Learning Outcomes	The student should understand the concept of analyticity of a function. The students should be able to compute contour integrals (residue theory) and be able to find conformal maps from one particular region to another given one.				
Prerequisites	MAS 018-MAS 019	Required			
Course Content	Complex Numbers, analytic (holomorphic) functions and Cauchy-Riemann equations. Harmonic functions. Exponential, logarithmic and trigonometric functions Integrals, Cauchy Theorem. Cauchy integral formula. Morera and Liouville's Theorems. Maximum principle. Fundamental Theorem of Algebra. Taylor and Laurent series. Residue calculus Conformal mappings and Mobius transformations. Applications to problems from physics and engineering.				
Teaching Methodology	Classroom instruction, problem solving session				
Bibliography	Complex Analysis and applications (J.Brown-R.Churchill)/Complex variables (Schaum's outliner)				
Assessment	Midterm exams, final exam				
Language	Greek				

Course Title	HISTORY OF MATHEMATICS				
Course Code	**10097 - MAS 007**				
Course Type	Taught				
Level	Undergraduate				
Year / Semester					
Teacher's Name					
ECTS	5	Lectures / week	4	Laboratories / week	2
Course Purpose and Objectives	Familiarization with the concept of infinity and the difficulties that human intellect has overcome with it over time, as well as the way it has been understood. The limits of the Sciences, the concepts of provable and non-provable. The beauty of the prime numbers. The mathematics of ancient Greeks and the way they influenced the evolution of Philosophy and Science. Utopian searches in Mathematics. Heroes and demigods of Mathematics. Introduction to the Philosophy of Mathematics.				
Learning Outcomes	Understanding the way in which Mathematics have influenced (and still influences) Sciences, Letters and Arts, and Philosophy.				
Prerequisites		Required			
Course Content	The understanding of infinite and the destiny of Cantor. Foundations: Lost and Found. Prime Number Theorem and Riemann Hypothesis. Roots of equations: The search for a non-existent formula. Archimedes, Newton and Gauss. The mathematics of ancient Greeks. The non-existent "Nobel Prize in Mathematics" and other prizes. Recent sensational developments.				
Teaching Methodology	Important mathematical concepts and biographical data are introduced, and then the audience is involved in a discussion for understanding both the concepts and how they have influenced since developments in human thinking.				
Bibliography	P.J. Davis and R. Hersh, *The Mathematical Experience*, Pelican, 1986 Singh, *Fermat's Last Theorem*, 4th Estate, 1997 M. Kline, *Mathematical Thought from Ancient to Modern Times*, OUP, 1972 S. Hollingdale, *Makers of Mathematics*, Pelican Books, 1989				
Assessment	Mid-term Examination 4/10, Final Examination 6/10				
Language	Greek				

Course Title	**Calculus for Computer Science I**				
Course Code	**MAS012**				
Course Type	**Mandatory (Computer Science)**				
Level	Undergraduate				
Year / Semester	First/Fall semester				
Teacher's Name					
ECTS	5	Lectures / week	2	Laboratories / week	1
Course Purpose and Objectives	Introduction to the basic notions of Calculus and familiarization of the students with the basic theorems and techniques. The course is designed for Computer Science students.				
Learning Outcomes	The students learn how to calculate limits, differentiate and integrate. Emphasis is put on the applications of derivatives and integrals.				
Prerequisites	None	Required	None		
Course Content	Introductory notions. Functions. Limits and Continuity. Derivatives and applications. Integrals. Indefinite and definite integrals. Fundamental theorems of Calculus. Integration techniques.				
Teaching Methodology	Lectures and problem solving.				
Bibliography	H. Anton, I. Bivens, S. Davis, CALCULUS (10th Edition), John Wiley & Sons, 2013 Γ. Γεωργίου, Χ. Σοφοκλέους, Σημειώσεις Μαθηματικών, Τόμος Α', Κατζηλάρης, 19				
Assessment	1 mid-exam, 4 quizzes, participation, final exam				
Language	Greek				

Course Title	Calculus for Computer Scientists II.				
Course Code	MAS013				
Course Type	Compulsory				
Level	Undergraduate				
Year / Semester	1/2				
Teacher's Name					
ECTS		Lectures / week	2	Laboratories / week	1
Course Purpose and Objectives	Introduction of the students to basic notions of calculus in one variable, in particular power series, integrals and applications of them in geometry and science.				
Learning Outcomes	The students are expected to 1. Acquire a solid knowledge of one variable calculus, 2. Be able to solve problems involving power series and integrals 3. Use the theory developed in order to solve certain geometric and physical problems.				
Prerequisites	MAS012	Required	None		
Course Content	Power series, Taylor and Maclaurin Series, Analytic functions, Indefinite and definite integrals, Geometric applications, Area, Volume Length of a curve, Improper integrals.				
Teaching Methodology	Lecture.				
Bibliography	*Calculus, Late Transcedentals,* 10th Edition, Howard Anton, Irl Bivens, Stephens Davis.				
Assessment	One midterm exam and a final exam.				
Language	Greek				

Course Title	**Introductory Mathematics I**				
Course Code	**MAS018**				
Course Type	Compulsory				
Level	Undergraduate				
Year / Semester	Year 1/Semester 1				
Teacher's Name					
ECTS	5	Lectures / week	2 (3hours)	Laboratories / week	1(1hour)
Course Purpose and Objectives	To understand calculus and to use basic methods to solve physical problems.				
Learning Outcomes	- Solve linear equations - Knowledge of simple concepts of Analytical Geometry - Knowledge of the concept of the function and the basic functions - Calculate basic limits and understanding the notion of continuity of a function - Understanding the notion of differentiation and to differentiate basic functions - Apply the knowledge of the notion of differentiation to real problems - Understanding the notion of the integral - Knowledge of the methods of integration - Applications of integration to physical problems - Applications of definite integrals - Understanding the notion of the sequence - Determination of the sum of simple series and test for convergence - Determination of power series for basic functions				
Prerequisites		Required			
Course Content	**Introduction** Real numbers – Inequalities – Absolute value – Equation of a straight line, circle and parabola **Functions** Kinds of functions – Graph of a function – Inverse function – inverse trigonometric functions – Exponential and Logarithmic functions **Limit and Continuity** Limit of a function – Continuity of a function - Intermediate-Value Theorem – Limits and Continuity trigonometric, Exponential and Logarithmic functions				

	The Derivative The derivative function – techniques of differentiation – Implicit differentiation- differentiation of inverse function – parametric equations **Applications of the Derivative** Increasing and decreasing functions – Relative extrema – Absolute extrema - Graphing of a function – Newton's method – Rolle's theorem – Mean value theorem **Integration** The indefinite integral – the definite integral – the fundamental theorem of calculus – Average value of a function **Principles of integral evaluation** Integration by parts – integration by substitution – integration of rational functions by partial fractions **Applications of integrals** Area between two curves – volumes by slicing- volumes by cylindrical shells – length of a plane curve – area of surface revolution **Improper integrals** **L' Hopital rules** **Sequencies** **Infinite series** Convergence tests – alternating series **Power series** Maclaurin and Taylor series – convergence – differentiation and integration of power series
Teaching Methodology	
Bibliography	**5.** CALCULUS (7th Edition), by H. Anton, I. Bivens, S. Davis, John Willey & Sons, 2003 **6.** Thomas' Calculus (10th Edition), by G. B. Thomas, R. L. Finney, M. D. Weir, F. R. Giordano, Pearson Addison Wesley, 2000 **7.** Calculus with Analytic Geometry, by H. C. Edwards, D. E. Penney, Prentice Hall, 1997 **8.** Calculus with analytic geometry, 4th ed., by R. Ellis, D. Gulick, Harcourt Brace Jovanovich, 1990

	Calculus with analytic geometry, 2nd ed., by D. G. Zill, PWS-KENT Publishing Company, 1998
Assessment	Mid-term exams and Final exam
Language	Greek

Course Title	Introductory Mathematics II				
Course Code	MAS019				
Course Type	Compulsory				
Level	Undergraduate				
Year / Semester	Year 1/Semester 2				
Teacher's Name					
ECTS	5	Lectures / week	2 (3hours)	Laboratories / week	1(1hour)
Course Purpose and Objectives	To understand calculus and to use basic methods to solve physical problems. To understand an introduction to Linear Algebra.				
Learning Outcomes	- Οι φοιτητές - Understand what is the concept of vector in the space - To calculate dot and cross product - To determine the equation of a straight line in the space and also the equation of a plane - The concept of vector functions - To determine unit tangent and normal vectors - The concept of curvature - To study the motion of a particle along a curve - The concept of a function of two variables - The concept of partial derivative - To use the chain rule - To determine tangent planes - To understand the concept of directional derivative - To determine maximum/minimum of functions of two variables - solve linear systems - the concept of matrix and determinant - the definition of vector space - the concept of linear independence - the concept of a base of a vector space - to determine eigenvalues and eigenfunctions - to diagonize a matrix - what is inner vector space - the concept of orthogonality - the concept of linear transformation				
Prerequisites	**Introductory Mathematics I**	Required			
Course Content	**VECTORS** Rectangular coordinates in 3-space – Vectors – Dot product – Cross				

	product – parametric equations of a line – planes in 3-space -Cylindrical and spherical coordinates **VECTOR-VALUED FUNCTIONS** Calculus of vector-valued functions – change of parameter – Arc length – Unit tangent and normal vectors – Curvature – Motion along a curve **FUNCTIONS OF TWO VARIABLES** Limits and continuity – partial derivatives – Differentiability – the chain rule – Directional derivative – Tangent planes – Maxima and minima of functions of two variables – Lagrange multipliers **LINEAR ALGEBRA** Systems of linear systems – Matrices -Determinants – Vectors – Vector spaces – Inner product spaces - Eigenvalues and eigenfunctions – Linear transformations
Teaching Methodology	
Bibliography	**9.** CALCULUS (7th Edition), by H. Anton, I. Bivens, S. Davis, John Willey & Sons, 2003 **10.** Thomas' Calculus (10th Edition), by G. B. Thomas, R. L. Finney, M. D. Weir, F. R. Giordano, Pearson Addison Wesley, 2000 **11.** Calculus with Analytic Geometry, by H. C. Edwards, D. E. Penney, Prentice Hall, 1997 **12.** Calculus with analytic geometry, 4th ed., by R. Ellis, D. Gulick, Harcourt Brace Jovanovich, 1990 **13.** Calculus with analytic geometry, 2nd ed., by D. G. Zill, PWS-KENT Publishing Company, 1998 **14.** H. Anton and C. Rorres, *Elementary Linear Algebra*, 6th edition, Wiley, 1991 **15.** S.F. Andrilli and D. Hecker, *Elementary Linear Algebra*, 3rd ed., Elsevier Academic Press, 2003
Assessment	Mid-term exams and Final exam
Language	Greek

Course Title	Mathematics for Engineers I				
Course Code	MAS025				
Course Type	Mandatory				
Level	Undergraduate				
Year / Semester	1st/1st semester				
Teacher's Name					
ECTS	5	Lectures / week	3 hrs/wk	Laboratories / week	1 hr/wk
Course Purpose and Objectives	Introduction to the basic concepts of single variable Calculus				
Learning Outcomes	Understand the notions of limits, continuity and differentiability of functions. Be able to calculate derivatives and use them in applications. Be able to calculate definite and indefinite integrals using various techniques as well as use integrals in applications (e.g. volume, arc-length). Study series and power series of functions and be able to recognize geometric, telescopic and harmonic series. Decide their convergence using appropriate tests. Calculate a Taylor series of a function.				
Prerequisites		Required			
Course Content	The real number system. Complex numbers (definition, elementary operations). Sequences of real numbers and limits. Real functions of one variable, limits, continuity. Hyperbolic, trigonometric functions. Derivatives of functions of one variable, tangent to a curve. Applications of derivatives. Mean value theorem, monotonicity, extrema, asymptotes. L'Hôpital's rule. Riemannian integral. Fundemental Theorem of Calculus. Indefinite integrals. Integration techniques (substitution, integration by parts, partial fractions, trigonometric substitution, etc). Applications of integrals, calculation of area, volume and length of a curve. Real number series. Convergence criteria. Power series. Series and Taylor's theorem.				
Teaching Methodology					
Bibliography	1. J. Stewart, Single variable calculus early transcendentals, 5th edition, 2003. 2. H. Anton, I. Bivens, S. Davis, CALCULUS (7th Edition), John Wiley & Sons,				

	2003. 3. R. A. Adams, Calculus a complete course, 1991.
Assessment	One midterm (40%) and one final exam (60%)
Language	Greek

Course Title	Mathematics for Engineers II				
Course Code	MAS026				
Course Type	Mandatory				
Level	Undergratuate				
Year / Semester	1st year, 2nd semester				
Teacher's Name					
ECTS	5	Lectures / week	2X2h	Laboratories / week	0
Course Purpose and Objectives	Introduction to functions of many variables and the basic notions and techniques of Vector Calculus. The course is designed for students in Engineering.				
Learning Outcomes	The students get familiar with functions with two or more variables, partial derivatives, multiple, line, and surface integrals, and the basic integral theorems of Vector Calculus.				
Prerequisites	None	Required	Mathematics for Engineers I		
Course Content	Functions of many variables. Partial derivatives. Gradient, divergence, and curl. Curves. Double and triple integrals. Change of variables. Jacobians. Polar, cylindrical, and spherical coordinates. Line and surface integrals. Green, Stokes, and Gauss theorems. Applications.				
Teaching Methodology	Lectures with brief theory and many examples.				
Bibliography	J. Marsden και A. Tromba, Διανυσματικός Λογισμός (Μετάφραση Α. Γιαννόπουλος), Πανεπιστημιακές Εκδόσεις Κρήτης, Ηράκλειο, 1992 H. Anton, I. Bivens, S. Davis, Calculus (10th edi.), John Wiley & Sons, Singapore, 2013.				
Assessment	Mid Exam (30%), Final Exam (40%-70%), Optional Participation (0-10%), 4 Optional Quizes (0-20%)				
Language	Greek				

Course Title	Mathematics for Engineers III				
Course Code	MAS027				
Course Type	Mandatory				
Level	Undergraduate				
Year / Semester	2nd/ 1st				
Teacher's Name					
ECTS	5	Lectures / week	3	Laboratories / week	1
Course Purpose and Objectives	Introduction to solving to ordinary differential equations, which are necessary for engineers.				
Learning Outcomes	Understanding how to find solutions to 1st and 2nd order differential equations and linear systems of differential equations. Applications to engineering problems are emphasized.				
Prerequisites		Required			
Course Content	Ordinary differential equations. Separable equations. Exact equations. Integrating factors. Solutions of linear and non-linear 1st order differential equations. 2nd order differential equations. Fundamental solutions of homogeneous equations. Non-homogeneous equations. Undetermined coefficients and variation of parameters. Series solutions. Applications of ordinary differential equations. Linear systems of differential equations. Laplace transforms.				
Teaching Methodology	Lectures with brief theory and emphasis given in examples.				
Bibliography	W.E. Boyce, R.C. DiPrima. Στοιχειώδεις διαφορικές εξισώσεις και προβλήματα συνοριακών τιμών, Πανεπιστημιακές Εκδόσεις ΕΜΠ, Αθήνα, 1999. W.E.Boyce & R.C. Diprima, Elementary Differential Equations and Boundary Problems, 8th Edition Wiley 2005.				
Assessment	One midterm (40%) and one final exam (60%)				
Language	Greek				

Course Title	Linear Algebra elements			
Course Code	MAS029			
Course Type	Mandatory			
Level	Undergratuate			
Year / Semester	1st year 1st semester department of Civil and Enviromental Engineering 1 Μηχανικών Περιβάλλοντος. 3nd year 3rd semester για το department of Electrical and Computer Engineering			
Teacher's Name				
ECTS	5	Lectures / week	2 times for 1&1/2 hours	Laboratories / week 1 hour per week
Course Purpose and Objectives	Introduction to the basic principles of Linear Algebra. Linear spaces, linear independency, base, dimension, inner product spaces. Linear systems of equations, matrices determinants, eigenvalues, eigenvectors. Gram-Schmidt normalisation. Introduction to Analytic Geometry.			
Learning Outcomes	The students get familiar with basic principles of Linear Algebra.			
Prerequisites	None	Required	None	
Course Content	Linear spaces, linear independency, base, dimension, inner product spaces. Linear systems of equations, matrices, determinants, eigenvalues, eigenvectors. Gram-Schmidt normalisation. Introduction to Analytic Geometry.			
Teaching Methodology	Lectures with brief theory and many examples.			
Bibliography	·Γ. Γεωργίου, *Γραμμική Άλγεβρα*, Καντζιηλάρης, Λευκωσία (1998). ·Χ. Σοφοκλέους, Στοιχεία Γραμμικής Άλγεβρας			
Assessment	Mid Exam (40%), Final Exam (60%)			
Language	Greek			

Course Title	Introduction to Probability and Statistics				
Course Code	MAS 030				
Course Type	Compulsory				
Level	Undergraduate				
Year / Semester	1st or 2nd / 1st or 2nd				
Teacher's Name					
ECTS	7	Lectures / week	3 hours	Laboratories / week	1 hour
Course Purpose and Objectives	To offer to engineering students basic knowledge of probability and statistics with emphasis on applications to their discipline.				
Learning Outcomes	With the completion of the course, students are expected to have acquired the basic knowledge of probability and statistics and be able to apply various statistical techniques to engineering problems				
Prerequisites	High school mathematics	Required			
Course Content	Descriptive statistics, measures of central tendency and variation, probability, exponential families of distributions, point estimation, sufficiency, completeness, confidence intervals for the mean, for the variance, for the difference of two means, for the ratio of variances, hypothesis testing, null hypothesis, alternative hypothesis, type I and type II error, tests for the mean with large or small samples, tests for comparing means and variances, linear regression, analysis of variance.				
Teaching Methodology	Lectures (3 hours), recitation class (1 hour)				
Bibliography	1. Devore J. : Probability and Statistics for Engineering and the Sciences, Brooks/Cole 2012 2. Ross, S.: Introduction to Probability and Statistics for Engineers and Scientists, Academic Press, 2004.				
Assessment	Midterm exams, final exam				
Language	Greek				

Course Title	Statistical Methods				
Course Code	MAS 051				
Course Type	Compulsory				
Level	Undergraduate				
Year / Semester	1st/1st and 2nd				
Teacher's Name					
ECTS	5	Lectures / week	3 hours	Laboratories / week	1 hour
Course Purpose and Objectives	To give the necessary statistical background to students from education and social sciences.				
Learning Outcomes	With the completion of the course, the students should be able to understand the basic ideas and principles of probability and statistics and be able to apply a variety of statistical methods and techniques to education and social sciences				
Prerequisites	High school mathematics	Required			
Course Content	Descriptive statistics, design of experiments, probability, binomial distribution, normal distribution, sampling, confidence intervals, hypothesis testing, correlation, linear regression, introduction to analysis of variance				
Teaching Methodology	Lectures and recitation classes				
Bibliography	1. T.C. Christofides: Statistical Methods (lecture notes) 2. D. Freedman, R. Pisani, R. Purves and A. Adhikari: Statistics, (latest edition) Norton				
Assessment	Two midterm exams and a final exam				
Language	Greek				

Course Title	Introduction to Probability and Statistics				
Course Code	MAS 055				
Course Type	Compulsory				
Level	Undergraduate				
Year / Semester	2nd/1st				
Teacher's Name					
ECTS	7	Lectures / week	4 hours	Laboratories / week	
Course Purpose and Objectives	To present to students of computer science basic ideas of probability and statistics which are relevant to computer science				
Learning Outcomes	With the completion of the course, the students should have the necessary background and knowledge in probability and statistics and be able to appreciate the applications in their field of computer science.				
Prerequisites	High school mathematics	Required			
Course Content	Probability, conditional probability, Bayes theorem, classical problems of probability (such as balls in bins, birthday problem), random variables, distributions (discrete and continuous), independence, expected values, applications (coupon collector's problem), probability inequalities (Jensen's inequality, Markov's inequality, Chebychev's inequality, Chernoff bounds), introduction to stochastic processes, Markov chains, applications, random walks, Poisson process, statistics, point estimation, confidence intervals, hypothesis testing, correlation, linear regression.				
Teaching Methodology	Lectures (4 hours)				
Bibliography	1. T. Christofides: Probability and Statistics (Lecture Notes) 2. R. Hogg and A Craig: Introduction to Mathematical Statistics, Prentice-Hall, 2012 3. M Mitzenmacher and E. Upfal: Probability and Computing, Cambridge University Press, 2005.				
Assessment	Midterm exam, homework assignments (in R), final exam				
Language	Greek				

Course Title	Statistical Analysis I				
Course Code	MAS 061				
Course Type	Obligatory				
Level	First				
Year / Semester	1				
Teacher's Name					
ECTS	6	Lectures / week	2	Laboratories / week	1
Course Purpose and Objectives	The students to obtain familiarity with the basic concepts of statistical analysis				
Learning Outcomes	See Course Objectives				
Prerequisites	None	Required	None		
Course Content	Descriptive Statistics, Probability(basic notions, conditional probability Bayes rule} Combinatorics, distributions, Central limit theorem, statistics, decision theory (confidence intervals, hypothesis testing, comparison between populations), etc				
Teaching Methodology	2				
Bibliography	Johnson, R. & Bhattacharyya, G. (1992) Statistics: Principles & Methods, J. Wiley. Any boon on Introductory Statistics				
Assessment	1 midterm (40%) or 2 midterm exams and a final (60%) examination.				
Language	Greek				

Course Title	Statistical Analysis II				
Course Code	MAS 062				
Course Type	Obligatory				
Level	First				
Year / Semester	1				
Teacher's Name					
ECTS	6	Lectures / week	2	Laboratories / week	1
Course Purpose and Objectives	To familiarise the students with the basic notions and practices of applied statistical analysis				
Learning Outcomes					
Prerequisites	MAS061	Required			
Course Content	Estimation of the difference of two means for dependent samples, statistical analysis of variance, statistical analysis for more than two samples, simple and multiple linear regression, non parametric methods				
Teaching Methodology	Lectures and problem solving sessions				
Bibliography	1) Βόντα, Ι. και Καραγρηγορίου, Α. (2015). Εφαρμοσμένη Στατιστική Ανάλυση και Στοιχεία Πιθανοτήτων, Αναθεωρημένη έκδοση, Εκδόσεις Παρασκήνιο, Σπύρος Μαρίνης, Σ. και Σία ΟΕ, Σόλωνος 76, Αθήνα. 2) Freund, J.E., Williams, F.J and Perles, B.M (1993). Elementary Business Statistics: the modern approach, 6th edition, Prentice Hall International Edition.				
Assessment	Homework 10%,				
Language	Greek				

Course Title	Biostatistics				
Course Code	MAS 066				
Course Type	Compulsory				
Level	Undergraduate				
Year / Semester	1st or 2nd / 1st or 2nd				
Teacher's Name					
ECTS	7	Lectures / week	3 hours	Laboratories / week	
Course Purpose and Objectives	To offer to students of biological sciences the basic knowledge in probability and statistics which are important for analyzing data relate to biological populations.				
Learning Outcomes	With the completion of the course, students should have acquired the basic knowledge of probability and statistics and be able to apply various statistical techniques for the analysis of biological data and information.				
Prerequisites	High school mathematics	Required			
Course Content	Descriptive statistics, probability, random variables, measures of central tendency and variation, distributions, binomial distribution, normal distribution, central limit theorem, estimation, confidence intervals, parametric and nonparametric hypothesis testing				
Teaching Methodology	Lectures (3 hours)				
Bibliography	1. I. Vonta and A. Karagregoriou: Applied Statistical Analysis (lecture notes) 2. B. Rosner: Fundamentals of Biostatistics, Duxbury Press, 2010				
Assessment	Midterm exams, final exam				
Language	Greek				