

Course Title	Computational Finance			
Course Code	ACF 423			
Course Type	Elective			
Level	Undergraduate			
Year / Semester	Year 3 / Year 4			
Teacher's Name	ARISTIDIS SAMITAS/GEORGE ANAYIOTOS/POLINA ELLINA			
ECTS	6	Lectures / week	2	Laboratories / week 1
Course Purpose and Objectives	This course provides students with the theoretical knowledge and technical skills to conduct their own quantitative research in Finance using statistical and econometric methodologies. The main objective of this course is to develop students' ability to formulate problems into quantitative models and solve them. Topics include distributional characteristics of returns, financial modeling, introduction to the main databases in Finance and Economics, and others. Students should be able to conduct their own statistical and econometric analysis using a statistical software package such as Stata and/or R-programming.			
Learning Outcomes	<p>Upon successful completion of this course, students should be able to:</p> <ul style="list-style-type: none"> ▪ Recognize the statistical and distributional properties of financial data ▪ Manipulate data using a statistical software package ▪ Understand the major databases in Finance and the importance of them in the empirical research ▪ Enhance critical thinking by explaining academic published paper's findings ▪ Conduct their own statistical analysis ▪ Present the findings using tables and interpret them in a financial context. ▪ Replicate already published papers in finance 			
Prerequisites	ACF 220, ACF 330, ACF 312	Required	NONE	
Course Content	<ul style="list-style-type: none"> ▪ Financial Time Series and Their Application <p>Asset returns, distributional properties of returns, moments of distributions, the Normal distribution, empirical properties of returns, symmetry and skewness in return distributions, kurtosis in return distributions, the rejection of the Normality null hypothesis</p> <ul style="list-style-type: none"> ▪ Statistical Methodologies and treatment <p>truncation and winsorization, detection of outliers, summary statistics, correlation</p>			

	<ul style="list-style-type: none"> ▪ Conditional heteroscedastic models <p>Characteristics of volatility, the ARCH model, GARCH models, the GARCH-M models, applications of models on real data</p> <ul style="list-style-type: none"> ▪ Databases for Accounting and Finance Research ▪ Empirical Finance Research using STATA/SAS <p>Replicate Papers in the Empirical Financial Literature</p>						
Teaching Methodology	<p>This course will be delivered as a combination of interactive lectures, in-class problem-solving exercises, and practice in the computer laboratory using a statistical software (e.g. Stata or R).</p>						
Bibliography	<ul style="list-style-type: none"> ▪ Analysis of Financial Time Series Ruey S. Tsay, Wiley 2010 3rd edition ▪ Empirical Asset Pricing: The Cross-Section of Stock Returns Bali Turan G., Engle Robert F., Murray Scott Wiley 2016 ▪ Stata Guide to Accompany Introductory Econometrics for Finance (October 1, 2019). Brooks, Chris. Introductory Econometrics for Finance Schopohl Lisa and Wichmann Robert and Brooks Chris Cambridge University Press 2019 ▪ CFA Program Curriculum 2020 Level I Statistical Concepts and Market Returns (reading 8) Wiley 						
Assessment	<table> <tr> <td>Midterm Exam</td> <td>30%</td> </tr> <tr> <td>Project</td> <td>25%</td> </tr> <tr> <td>Final Exam</td> <td>45%</td> </tr> </table>	Midterm Exam	30%	Project	25%	Final Exam	45%
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Language	English						