

Course Title	Principles of Programming for R				
Course Code	AEM625				
Course Type	Elective				
Level	Master (2 <sup>nd</sup> Cycle)				
Year / Semester	1 <sup>st</sup> Year / 1 <sup>st</sup> Semester				
Teacher's Name	TBA				
ECTS	10	Lectures / week	3 Hours / 14 weeks	Laboratories / week	None
Course Purpose and Objectives	The course aims to Introduce students to the main key principles in programming for data analysis, and it specifically focuses on R programming.				
Learning Outcomes	<p>Upon successful completion of this course student will be able to:</p> <ul style="list-style-type: none"> <li>• Explain and use basic concepts in R programming;</li> <li>• Construct and execute basic programs in R;</li> <li>• Design and implement basic algorithms in R;</li> <li>• Use external libraries with R;</li> <li>• Use R for statistical calculations;</li> <li>• Use R to download financial data from web sources;</li> <li>• Graphically visualise data and results of statistical calculations;</li> </ul>				
Prerequisites	None		Co-requisites	None	
Course Content	<p>General introduction to programming and students will learn and practice programming concepts along with tackling practical issues in statistical computing in R.</p> <ul style="list-style-type: none"> <li>• Programming in R <ul style="list-style-type: none"> <li>➤ Review of the main packages and key points in R</li> <li>➤ Reading and writing efficient code in R</li> <li>➤ Plotting and Data Visualization</li> <li>➤ Data Transformation techniques</li> <li>➤ String manipulation techniques</li> <li>➤ Dates, Times and advanced Data Structures</li> <li>➤ Extracting financial data from the web</li> </ul> </li> <li>• Introduction to basic statistical applications with practical examples in R <ul style="list-style-type: none"> <li>➤ Descriptive statistics</li> <li>➤ Simulations and random numbers</li> <li>➤ Probability and the Normal Distribution</li> <li>➤ Sampling Distributions and Confidence Intervals</li> </ul> </li> </ul>				

Teaching Methodology	Face-to-Face								
Bibliography	<ol style="list-style-type: none"> <li>1. R for Everyone, J.Lander , 2nd Edition, Addison Wesley Data and Analytics</li> <li>2. The Book of R: A First Course in Programming and Statistics, Davies T. M., No Starch Press</li> <li>3. R for Data Science: Import, Tidy, Transform, Visualise and Model Data, H. Wickham and G. Golemund, O'Reilly</li> </ol>								
Assessment	<table border="1"> <tr> <td>Examinations</td> <td>50%</td> </tr> <tr> <td>Assignments</td> <td>40%</td> </tr> <tr> <td>Class Participation and Attendance</td> <td>10%</td> </tr> <tr> <td></td> <td>100%</td> </tr> </table>	Examinations	50%	Assignments	40%	Class Participation and Attendance	10%		100%
Examinations	50%								
Assignments	40%								
Class Participation and Attendance	10%								
	100%								
Language	English								