

Course Title	Analytical Decision Making				
Course Code	MB682				
Course Type	Major Elective				
Level	BSc/1st Cycle				
Year / Semester	4 th /8 th				
Teacher's Name	Ioannis Filippopoulos				
ECTS	7.5	Lectures / week	3 hours	Laboratories / week	
Course Purpose and Objectives	The main objectives of the course are to: • introduce students to the basic principles of operational research / management science and to familiarise them with its basic concepts • introduce students to a range of analytical methods and tools • develop students' ability to build numerical models and use them to propose policy alternatives • develop students' analytical skills • develop students' ability to summarise and present data in a professional way • develop students' skills in practical decision making • develop students' ability to communicate effectively with non-technical managers • provide a conceptual understanding of the role of the methods of science in decision making • help students appreciate the limitations of the methods of science in decision making.				
Learning Outcomes	After completion of the course students are expected to be able to: 1. recognise the importance of operational research / management science in providing appropriate analytical and processual support to management 2. recognise the importance of analytical methods in problem solving and decision making 3. structure business and management problems so that these can be solved by numerical means 4. select appropriate analytical methods to address particular types of business and management problems 5. use appropriate analytical methods to solve business and management problems 6. formulate analytical models to help propose policy alternatives				

	7. summarise and present data in a professional way 8. appreciate the limitations of the methods of science in decision making 9. communicate effectively with non-technical managers.		
Prerequisites		Required	
Course Content	Linear programming – part 1 (Formulating and solving linear programming problems with two decision variables – the graphical solution method). Linear programming – part 2 (Formulating and solving linear programming problems with more than two decision variables – the Simplex method). Linear programming – part 3 (Securing a starting feasible solution in linear programming – the Two-Phase method). Linear programming – part 4 (Special applications of linear programming – the transportation model). Linear programming – part 5 (Special applications of linear programming – the assignment model). Forecasting – part 1 (Time series forecasting using simple exponential smoothing). Forecasting – part 2 (Dealing with trend – time series forecasting using Holt's exponential smoothing). Forecasting – part 3 (Dealing with seasonality – time series forecasting using time series decomposition). Forecasting – part 4 (Measuring forecast accuracy).		
Teaching Methodology	Lectures, group work, case studies, computer workshops, solving problems in class and in the computer lab, guest speakers, homework and background reading.		
Bibliography	D. R. Anderson, D. J. Sweeney, T. A. Williams, J. D. Camm, J. J. Cochran, M. J. Fry and J. W. Ohlmann, An Introduction to Management Science – Quantitative Approaches to Decision Making (14th ed.) Cengage Learning 2016 9781111823610 F. Hillier and G. Lieberman, Introduction to Operations Research (9th ed.) McGrawHill 2010 9780073376295		
Assessment	Tests, homework activities, student projects, mid-term examination, final examination.		
Language	English		