SEMESTER 1

1. Quantitative Methods and Project Management in the Public Sector

GENERAL

SCHOOL	ECONOMIC SCIENCES
DEPARTMENT	ECONOMIC SCIENCES
LEVEL OF STUDY	*Postgraduate*
COURSE UNIT CODE		**SEMESTER OF STUDY**	1st
COURSE TITLE	Quantitative Methods and Project Management in the Public Sector

COURSEWORK BREAKDOWN	**TEACHING WEEKLY HOURS**	**ECTS Credits**
Lectures	3	10

COURSE UNIT TYPE	Scientific Area
PREREQUISITES:	No
LANGUAGE OF INSTRUCTION/EXAMS:	Greek
COURSE DELIVERED TO ERASMUS STUDENTS	NO
MODULE WEB PAGE (URL)	

2. LEARNING OUTCOMES

Learning Outcomes

Upon successful completion of this unit, the student will be able to apply mathematical methods to:
- Collect, classify, and present data
- Describe and combine data
- Retrieve, analyze, and synthesize data and information
- Draw conclusions based on data
- Solve probability-related problems
- Model real-life problems as linear programming problems
- Optimize networks
- Manage projects

Appropriate software tools will be used for all of the above.

General Skills

- *Search, analysis, and synthesis of data and information, using the necessary technologies*
- *Decision-making*
- *Independent work*
- *Work in an interdisciplinary environment*
- *Generation of new research ideas*
- *Promotion of free, creative, and inductive thinking*

3. COURSE CONTENTS

- Introduction – Basic Concepts in Statistics
  (population, sample, sampling, types of data)

- Descriptive Statistics
  (frequency tables, graphical representation of data, measures of central tendency, measures of variability, measures of skewness, outliers)
- Introduction to Probability Theory
  (random experiment, sample space, classical definition of probability, basic counting principles, combinations, permutations), conditional probability
- Random Variables and Distribution Functions
  (discrete and continuous random variables, expected value, variance; Binomial distribution, Geometric distribution, Poisson distribution, Normal distribution)
- Statistical Inference
  (confidence intervals: for the mean, for proportions, for variance; hypothesis testing).
  Statistical software: SPSS
- Linear Programming
  (graphical solution, Simplex method, sensitivity analysis; modeling real-life problems as linear programming problems).
  Case studies: portfolio analysis, production planning, advertising and media selection.
  Software: MS Excel, QSB, LINDO
- Special Cases in Linear Programming
  Transportation problem: initial solution using the Northwest Corner method, Vogel's method, Least Cost method; unbalanced problems
  Assignment problem: Hungarian method
- Inventory Control Theory
  (importance and scope of inventory control, types of inventory, inventory-related costs, selective inventory control, Economic Order Quantity, inventory management systems)
- Project Management
  (network optimization, charts, diagrams and trees, critical activities and paths; CPM, PERT methods)
- Dynamic Programming

4. TEACHING METHODS - ASSESSMENT

MODE OF DELIVERY	Distance Learning	
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY	Powerpoint presentation e-class e-mails	
TEACHING METHODS	*Method description*	*Semester Workload*
	Lectures	39
	Individual coursework	80
	Personal study and coursework	131
	Total	*250*
ASSESSMENT METHODS	Final Written examination (100%)	

5. RESOURCES

- Stephen Bernstein, Element of Statistics I: Descriptive Statistics and probability, Schum's outlines (1998).
- Ballou R.H., Business Logistics /Supply Chain Management. 5th Edition, (2004) Prentice Hall.
- Chopra, S., Meindl, P. Supply Chain Management: Strategy, Planning, and Operation. 5th Edition, (2012), Prentice Hall.