COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF STATISTICS AND ACTUARIAL – FINANCIAL MATHEMATICS		
LEVEL OF STUDIES	UNDERGRADUATE PROGRAM		
COURSE CODE	331-4157	SEMESTER	G
COURSE TITLE	TIME SERIES		

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	WEEKLY TEACHING HOURS	CREDITS
	3	6
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Special background
PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	http://www.actuar.aegean.gr/index.php/en/academics/undergraduate-programs

(2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

Students who attend the course successfully should:

Have understood the concept of serial correlation and be able to test, whether or not, it exists by performing various statistical tests.

To have understood the mathematical concept of decomposition of a time series into components and be able to appropriately utilize these components to perform extrapolation, smoothing etc.

To use the proper statistical tools and be able to identify the character of serial correlation in a time series.

To have understood the Box-Jenkins model-building strategy and be able to create stochastic models of such kind.

To be able to perform statistical forecasts using such models.

To be able to detect serial correlation in the residuals of a simple econometric time series model to

know the consequences and to be able to correct for serial correlation.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Team work	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	*……*
Production of new research ideas	*Others…*
	…….

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Working independently
Team work
Decision-making
Production of free, creative and inductive thinking

(3) SYLLABUS

Introductory concepts. Time series decomposition. Simple extrapolation, smoothing and seasonal adjustment methods. Managing serial correlation following the classical econometric approach. Statistical tests for autocerrelation. Temporal operators and statistical tools for time series analysis. ARIMA and SARIMA models. Box-Jenkins model building strategy. Parameter estimation. Forecasting with ARIMA models. Applications using computer software.

Lab: Applications through the use of appropriate software.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face-to-face
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Communication with students via e-mail Uploading lecture notes and other course material on e-class system
TEACHING METHODS *The manner and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.* *The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS*	

Activity	*Semester workload*
Lectures	39
Independent study	98
Course total (25 per ECTS)	137

STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *Language of evaluation, methods of evaluation,*	Student evaluation is done in Greek through: (a) a compulsory written examination which includes questions and problem solving;

summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	(b) optionally, homework done individually or in small groups, delivered regularly and oral presentations. For students with disabilities, evaluation takes place via oral exams.

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

In Greek:

1. Ανάλυση χρονολογικών σειρών Μεθοδολογία Box-Jenkins, Θαλασσινός Λευτέρης Ι.
2. Σύγχρονη Οικονομετρία, Βάμβουκας Γεώργιος
3. Εισαγωγή στην Οικονομετρία – Ενιαίο, Χρήστου Γεώργιος Κ.
4. Σύγχρονες Μέθοδοι Ανάλυσης Χρονολογικών Σειρών, Δημέλη Σοφία

In English:

1. Pindyck, R, and Rubinfeld, D. (1998) Econometric Models and Economic Forecasts, Part IV, Irwing/McGraw-Hill.
2. Mills T. (1991) Time Series Techniques for Economists, Cambridge University Press.
3. Brockwell P. and Davis R. (2002) Introduction to Time Series and Forecasting Second Edition, Springer

- Related academic journals: