**COURSE OUTLINE**

1. **GENERAL**

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| **FACULTY** | Applied Economics and Social Sciences |
| **SECTION** | Department of Regional and Economic Development |
| **LEVEL OF STUDY**  | Undergraduate |
| **COURSE CODE** | 6525 | **SEMESTER OF STUDY** | 7th |
| **COURSE TITLE** | Regional Analysis Methods  |
| **INSTRUCTOR** | ANNA FTOULI |
| **INDEPENDENT TEACHING ACTIVITIES** *in case the credits are awarded to distinct parts of the course e.g. lectures, laboratory exercises, etc. If the credits are awarded uniformly for the entire course, indicate the weekly teaching hours and the total credits* | **TEACHING WEEKS** | **CREDITS/CREDITS** |
| Lectures | 4 | 5 |
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| *Add rows if needed. The teaching organization and teaching methods used are described in detail in 4.* |  |  |
| **COURSE TYPE***Background, General Knowledge, Scientific Area, Skills Development* | scientific area course |
| **PREREQUISITE COURSES:** |  |
| **LANGUAGE OF INSTRUCTION AND EXAMINATIONS:** | Greek |
| **THE COURSE IS OFFERED TO ERASMUS STUDENTS** |  |
| **COURSE WEBSITE (URL)** | GI AUA (www.aua.gr)A (www.aua.gr) |

1. **LEARNING OUTCOMES**

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| **Learning Outcomes** |
| *The learning outcomes of the course are described, the specific knowledge, skills and competences of an appropriate level that students will acquire after the successful completion of the course.**Consult Appendix A* * *Description of the Level of Learning Outcomes for each cycle of study according to the Qualifications Framework of the European Higher Education Area*
* *Descriptors of Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning*

*and Appendix B** *Learning Outcomes Writing Summary Guide*
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| The course introduces students to the central issues of Regional Science, presenting basic methods and techniques of regional analysis. The understanding and ability to use these methods will give students an important tool, particularly useful in the systematic investigation, analysis and interpretation of economic and social phenomena occurring in space and inequalities between spatial units. It will thus contribute to the acquisition of the knowledge and specialized technical background necessary for policy decision-making and for the rational planning and planning of spatial units at the various levels. Upon successful completion of the course, specific and measurable learning outcomes are expected, which are developed in the following three (3) distinct categories:Knowledge:* Understand the basic concepts and methods of quantitative regional analysis.
* Name the basic methods of quantitative, regional and spatial analysis.
* Understand the substantial differences between the individual methods of regional and spatial analysis.
* To get acquainted with indicators, functions, models, models and models, derived from mathematics, physics and econometrics, and used internationally for the study and analysis of phenomena of regional science, development, interregional inequalities, interactions, convergences or divergences.

Abilities* Apply basic quantitative methods of regional analysis to measure the different relationships that can be established between regions.
* Quantify regional disparities and distinguish or classify regions (or other territorial entities) as strong and weak according to the analytical parameter.
* To calculate and verify phenomena of regional disparities.
* Interpret the results from the application of basic methods of quantitative, regional and spatial analysis.

Skills* Define the most appropriate method of quantitative, regional or spatial analysis depending on the request/problem, and the available data.
* Seek appropriate data for the application of the most appropriate method of regional or spatial analysis.
* Understand the extension of the use of concepts and tools of mathematics, physics and econometric analysis to spatial issues.
* Use their knowledge to solve real regional problems.
* Model the process by which the development of a region will be achieved.
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| **General Competencies** |
| *Taking into account the general competencies that the graduate must have acquired (as listed in the Diploma Supplement and listed below), which of them does the course aim at?.* |
| ***Search, analyze and synthesize data and information, using the necessary technologies*** *Adapting to new situations* ***Decision-making*** *Autonomous work* *Teamwork* *Working in an international environment* *Working in an interdisciplinary environment* ***Generation of new research ideas***  | *Project planning and management* *Respect for diversity and multiculturalism* ***Respect for the natural environment*** *Demonstrate social, professional and ethical responsibility and sensitivity to gender issues* *Criticism and self-criticism* ***Promoting free, creative and inductive thinking*** |
| * Search, analyze and synthesize data and information, using the necessary technologies
* Adapting to new situations
* Decision-making
* Autonomous work
* Teamwork
* Working in an international environment
* Working in an interdisciplinary environment
* Generation of new research ideas
* Respect for diversity and multiculturalism
* Respect for the natural environment
* Demonstrate social, professional and ethical responsibility
* Criticism and self-criticism
* Promoting free, creative and inductive thinking
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1. **COURSE CONTENT**

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| 1. DELIMITATIONS: The interdisciplinary framework of regional analysis, mathematics (statistics, geometry, linear algebra, linear programming, graph theory, combinatorics) and regional analysis, economic (microeconomics, macroeconomics, econometrics) and regional analysis, physics (complex networks, mechanics, thermodynamics) and regional analysis, geography and regional analysis, transport engineering and regional analysis, demarcations (the concept of variable, index, model, model, standard), modeling definition, modeling modes and methods.
2. MATHEMATICAL METHODS: Space as a mathematical concept, mathematical topology, metric functions, elements of vector calculus, elements of matrix calculus, set theoretical and geometric representation of spatial entities, graphic, algebraic and heuristic optimization methods in regional analysis.
3. STATISTICAL AND PROBABILISTIC METHODS: Graphical representation of regional quantities, the use of location and dispersion measures in regional analysis, measurement of spatial concentrations and variations, spatial distributions, correlation and spatial correlation, parametric interpolation, univariate and multivariate linear regression.
4. TIME SERIES ANALYSIS AND REGIONAL ANALYSIS: Graphical study of time-varying magnitudes, time series, scattering, methods of detection and analysis of seasonality, autocorrelation analysis, curve interpolation, nonlinear models (registerary, chaotic, network).
5. METHODS OF PHYSICAL AND STATISTICAL ENGINEERING: Spatial interdependence models, population potential, gravity models, thermodynamic diffusion models, spatial networks, modeling of spatial interaction systems in graphs, epistemological approach of spatial networks, spatial networks and application fields, conceptual determinations in the study of spatial networks, flatness, spatial network modeling tools, measures of centrality.
6. STATISTICAL AND ECONOMETRIC METHODS: Basic concept analysis, correlation, Multiple Linear Regression, Binomial Logistic Regression, Multinomial logistic regression, Tobit analysis, Geographically Weighted Regression (GWR).
7. REGIONAL ACCOUNTS DATA: Gross and net regional product, regional income and regional disposable income, GDP per capita, productivity of the regional economy, level of prosperity of a region, real and nominal GDP.
8. OUTPUT FUNCTIONS: general form of a production function, linearly homogeneous production functions, linear production function, Cobb-Douglas production function, Leontief production function, CES constant elasticity production function, Translog production functions.
9. MACROECONOMIC REGIONAL AGGREGATES AND CHARACTERISTICS: Changes in output, macroeconomic characteristics, specialization of the regional economy, public and private investment, degree of urbanization and population density, quality of work, demographic changes, environmental data, regional competitiveness.
10. METHODS FOR MEASURING INEQUALITIES: Theil index, Lorenz curve, Gini coefficient, concentration coefficient, Florence coefficient, Gini coefficient – Hirschman.
11. METHODS OF DECONSTRUCTION AND GROUPING: Shift - Share Analysis, classical model variations, case studies.
12. DECONSTRUCTION AND CLUSTERING METHODS: Factor Analysis (FA), Principal Component Analysis (PCA), Cluster Analysis (CA), Input-Output Analysis, SWOT analysis.
13. OPTIMIZATION METHODS: Data Envelopment Analysis (DEA), Detection of communities in networks of spatial units with maximizing modularity optimization.
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1. **TEACHING AND LEARNING METHODS - ASSESSMENT**

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| **DELIVERY***METHOD Face to face, Distance learning, etc.* | Lectures and meetings with students  |
| **USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES***Use of ICT in Teaching, Laboratory Training, Communication with students* | A computer and interactive whiteboard will be used in teaching. Communication with students will take place on a personal level, also using e-mail and telecommunication (eg. Skype)  |
| **TEACHING ORGANIZATION***The method and methods of teaching are described in detail.**Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliography Study & Analysis, Tutorial, Internship (Placement), Clinical Practicing, Art Workshop, Interactive Teaching, Educational visits, Project Writing, Writing a project / assignments, Artistic creation, etc.**The student's study hours for each learning activity are listed as well as the hours of unguided study so that the total workload at semester level corresponds to ECTS standards* |

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| ***Activity*** | ***Semester Workload*** |
| Course delivery  | 52 hr |
| Study of taught material | 45 hr |
| Study and research of databases and additional work | 35 hr |
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| CourseTotal: | 132 hr |

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| **STUDENT EVALUATION** *Description of the evaluation process**Assessment Language, Assessment Methods, Formative or Summative, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay/Report, Oral Examination, Public Presentation, Laboratory Work, Clinical Examination of a Patient, Artistic Interpretation, Other/Others**Explicitly defined evaluation criteria and whether and where they are accessible to students are mentioned.* | Written exams at the end of the course and progress examinations during the semester. |

1. **RECOMMENDED-BIBLIOGRAPHY**

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| The basic bibliography to be used is *Greek Language Bibliography*1. Polyzos, S., (2011) Regional Development, Athens, Kritiki Publications.
2. Polyzos, S., (2015) Urban Development, Athens, Kritiki Publications.
3. Gioti - Papadaki, O., (2011) Introduction to Economic Geography, Athens, Kritiki Publications.
4. Konsolas, N., (1997) Contemporary Regional Economic Policy, Papazisis Publications, Athens.

*Foreign Language Bibliography*1. Armstrong H. W. and Taylor J. (2000), Regional Economics and Policy, Oxford: Blackwell.
2. Pike A., Rodriguez-Pose A. and Tomaney J. (2006), Local and Regional Development, New York: Routledge.
3. Pike A., Rodriguez-Pose A. and Tomaney J. (2010), Handbook of Local and Regional Development, New York: Routledge.
4. Rodrigue, J. P., Comtois, C., Slack, B., (2013) The Geography of Transport Systems, New York, Routledge Publications.

 *Indicative Articles*1. Amin, A. (1999). An institutionalist perspective on regional economic development. International journal of urban and regional research, 23(2), 365-378.
2. Bebbington, A. (2003). Global networks and local developments: Agendas for development geography. Tijdschrift voor economische en sociale geografie, 94(3), 297-309.
3. Coe, N. M., Hess, M., Yeung, H. W. C., Dicken, P., & Henderson, J. (2004). ‘Globalizing’regional development: a global production networks perspective. Transactions of the Institute of British geographers, 29(4), 468-484.
4. Polyzos, S., Tsiotas, D., (2020) “The contribution of transport infrastructures to the economic and regional development: a review of the conceptual framework”, Theoretical and Empirical Researches in Urban Management, 15(1), pp.5-23.
5. Coe, N. M., Hess, M., Yeung, H. W. C., Dicken, P., & Henderson, J. (2004). ‘Globalizing’regional development: a global production networks perspective. Transactions of the Institute of British geographers, 29(4), 468-484.
6. Cook, I. R. (2010). Policing, partnerships, and profits: the operations of Business Improvement Districts and Town Center Management schemes in England. Urban Geography, 31(4), 453-478.
7. Pnevmatikos, T., Polyzos, S., Tsiotas, D., (2019) “Assessing the structural changes in the Greek economy for the period prior to economic crisis”, Regional Science Inquiry, 11(3), pp.69-82.
8. Cullen, I., & Godson, V. (1975). Urban networks: the structure of activity patterns. Progress in planning, 4, 1-96.
9. Friedmann, J. (1966). Regional development policy: a case study of Venezuela (No. HT395. V4 F7).
10. Gibbs, D., Deutz, P., & Proctor, A. (2005). Industrial ecology and eco‐industrial development: A potential paradigm for local and regional development?. Regional studies, 39(2), 171-183.
11. Glasson, J. (2003). The widening local and regional development impacts of the modern universities-a tale of two cities (and north-south perspectives). Local Economy, 18(1), 21-37.
12. Hadjimichalis, C., & Hudson, R. (2007). Rethinking local and regional development: Implications for radical political practice in Europe. European Urban and Regional Studies, 14(2), 99-113.
13. Hilhorst, J. G. (1998). Industrialization and local/regional development revisited. Development and change, 29(1), 1-26.
14. Jamali, D. (2004). Success and failure mechanisms of public private partnerships (PPPs) in developing countries: Insights from the Lebanese context. International Journal of Public Sector Management, 17(5), 414-430.
15. Tsiotas, D., Aspridis, G., Gavardinas, I., Sdrolias, L., Skodova – Parmova, D., (2018) “Gravity modeling in Social Science: the case of the commuting phenomenon in Greece”, Evolutionary and Institutional Economics Review, doi:10.1007/s40844-018-0120-y.
16. Kotler, P., & Gertner, D. (2002). Country as brand, product, and beyond: A place marketing and brand management perspective. Journal of brand management, 9(4), 249-261.
17. Malecki, E. J. (1993). Entrepreneurship in regional and local development. International regional science review, 16(1-2), 119-153.
18. Malecki, E. J. (1997). Technology and economic development: the dynamics of local, regional, and national change.
19. Matten, D., & Moon, J. (2004). Corporate social responsibility. Journal of business Ethics, 54(4), 323-337.
20. McWilliams, A. (2000). Corporate social responsibility. Wiley Encyclopedia of Management.

 *Other relevant indicative bibliography*1. Lambrianidis L. (2014), Economic Geography, Athens, Patakis Publications.
2. McCann Ph. (1992), Urban and Regional Economics, Athens, Kritiki Publications.
3. Armstrong H. & J. Taylor (2000), Regional Economics and Policy, Massachusetts: Blackwell
4. Thirlwall A. (1999), Growth and Development, Athens, Papazisis Publications (2001).
5. Tsiotas, D., Sdrolias, L., Aspridis, G., Skodova-Parmova, D., Dvorakova-Liskova, Z., (2019) “Size distribution analysis in the study of urban systems: evidence from Greece”, *International Journal of Computational Economics and Econometrics.*
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7. Skountzos Th. (1993), Regional Economic Analysis and Policy, Athens, Stamoulis Publications.
8. Park, C. W., Jaworski, B. J., & Maclnnis, D. J. (1986). Strategic brand concept-image management. The Journal of Marketing, 135-145.
9. Pike, A., Rodríguez-Pose, A., & Tomaney, J. (2007). What kind of local and regional development and for whom?. Regional studies, 41(9), 1253-1269.
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13. Krugman P. (2000), The Return of Depression Economics, New York: Norton and Company.
14. Porter M. E. (1990), The Competitive Advantage of Nations, New York: Free Press.
15. Scott J. A. (1998), Regions and the World Economy: The coming Shape of Global Production, Competition and Political Order, Oxford: Oxford University Press
16. Amin A. and Thrift N. (1994), Globalization, Institutions, and Regional Development in Europe, Oxford University Press .
17. Harvey D. (2006), Spaces of Global Capitalism: A Theory of Uneven Geographical Development, London: Verso.

*Related scientific journals*Journal of Economic Geography (Oxford)The Annals of Regional Science (Springer)Regional Studies (Taylor & Francis)Entrepreneurship and Regional Development (Taylor & Francis)Review of Urban & Regional Development Studies (Wiley)Regional Science and Urban Economics (Elsevier)International Journal of Innovation and Regional Development (Interscience)Region (ERSA)Regional Science Inquiry (H.A.R.S.)Networks and Spatial Economics (Springer) |