Syllabus

Descrizione corso

Titolo insegnamento	Metodi Quantitativi per il Management
Codice insegnamento	30190
Titolo aggiuntivo	
Settore Scientifico-Disciplinare	STAT-04/A
Lingua	Tedesco
Corso di Studio	Corso di laurea in Management del Turismo, dello Sport e degli Eventi
Altri Corsi di Studio (mutuati)	
Docenti	dott. Benjamin Weißing, Benjamin.Weissing@unibz.it https://www.unibz.it/en/faculties/economics-management/academic-staff/person/35796
Assistente	
Semestre	Secondo semestre
Anno/i di corso	3
CFU	6
Ore didattica frontale	36
Ore di laboratorio	-
Ore di studio individuale	-
Ore di ricevimento previste	18
Sintesi contenuti	This course introduces students to essential quantitative techniques for informed decision-making in management. It covers foundational concepts in data analysis and optimisation (including linear and integer programming), with an emphasis on practical application. Students will gain experience using software tools such as Python to model and interpret quantitative problems.
Argomenti dell'insegnamento	- linear-, integer-, and nonlinear programming, multiple objective optimisation

	- graph theory and networks - project-planning - statistics and probability - stochastic models - regression and predictive modelling - time series analysis - decision theory and utility modelling
Parole chiave	optimisation, statistics, mathematical modelling, decision-making
Prerequisiti	Basic knowledge in linear algebra and statistics.
Insegnamenti propedeutici	
Modalità di insegnamento	Synchronous, in-person lecture and exercises.
Obbligo di frequenza	-
Obiettivi formativi specifici e risultati di apprendimento attesi	ILO (Intended Learning Outcomes) ILO 1 - Knowledge and understanding ILO 1.1 The concept of uncertainty and the basic elements of probability theory. ILO 1.2 The fundamentals of linear programming in economics and management. ILO 1.3 The fundamentals of order theory, in particular partial and total (linear) order relations. ILO 1.4 The effects of non-total order relations on decision models ILO 2 – Ability to apply knowledge and understanding ILO 2.1 Formally define economic problems; find (optimal) solutions based on existing theories and interpret results. ILO 2.2 Use mathematical tools to analyse static and dynamic models. ILO 2.3 Mathematical problems and models as well as ideas for solving them. ILO 2.4 Use mathematical tools to analyse static and dynamic models with multiple variables. ILO 2.5 Use algorithms/applications to solve linear programmes and their dual problems. ILO 2.6 Solve zero-sum games between two people using linear programming. ILO 2.7 Solve linear programmes for business problems: cost and revenue optimisation, logistics design and optimisation, inventory

	flow planning, etc. ILO 2.8 Use mathematical methods to model risks (uncertainties) and solve expected utility maximisation problems. ILO 2.9 Distinguishing between decision situations with complete and incomplete preferences and then using the appropriate model. ILO 3 - Making judgements ILO 3.1 Identify the most important variables to be used in decision-making in complex situations. ILO 3.2 Report analytically and critically on information, empirical values and data in order to make adequate business decisions. ILO 3.3 Select the most appropriate quantitative and qualitative analysis tools to support decision-making. ILO 3.4 Find necessary additional information in databases, legal documents and scientific sources; ILO 3.5 Find solutions by using logical conclusions and combining information and analytical tools ILO 4 - Communication skills ILO 4.1 The educational activities in the first year include courses in all three official languages of instruction, covering communication and presentation strategies and techniques, as well as the acquisition of various skills for the cultural environment related to language. The second year includes a language course in a fourth language. Case studies, projects and exercises within the courses, as well as the written exams at the end of each course, also contribute to the development of students' communication skills. ILO 4.2 The achievement of this objective is assessed by means of written exams, group work, homework assignments, the presentation of case studies and projects, and the final thesis. ILO 5 - Learning skills ILO 5.1 the ability to retrieve and utilise information from databases, research studies, legal texts, regulations and standards that are required in their professional life; ILO 5.2 the ability to analyse, critically evaluate and integrate data, information and experience; ILO 5.3 the ability to develop possible solutions to problems in

	economic and operational areas relating to those work contexts that represent potential career prospects for graduates.
Obiettivi formativi specifici e risultati di apprendimento attesi (ulteriori info.)	
Modalità di esame	Written final exam with open questions concerning the topics from the lecture (ILO 1-5). Same exam for attending and non-attending students.
Criteri di valutazione	Correctness and comprehensibility of the answers given in the final exam.
Bibliografia obbligatoria	• Canela, Miguel Ángel; Alegre, Inés; Ibarra, Alberto. ***Quantitative Methods for Management: A Practical Approach.*** Cham: Springer Nature Switzerland, 2019. ISBN 978-3-030-17554-2 (eBook). • Bankhofer, Udo. ***Quantitative Unternehmensplanung: Mathematische Methoden und betriebliche Anwendungsbeispiele.*** Wiesbaden: Springer Fachmedien Wiesbaden, 2022. ISBN 978-3-8348-2466-0 (eBook). • Werners, Brigitte. ***Grundlagen des Operations Research: Mit Aufgaben und Lösungen.*** 3rd edition. Berlin/Heidelberg: Springer Gabler, 2013. ISBN 978-3-642-40102-2 (eBook).
Bibliografia facoltativa	
Altre informazioni	
Obiettivi di Sviluppo Sostenibile (SDGs)	Istruzione di qualità