DEPARTMENT OF ACTUARY AND RISK MANAGEMENT

Content of Master's Degree in Actuary and Risk Managementwith Thesis

COURSE CODE	COURSE NAME AND CONTENTS	T	A	C	ECTS
ARY703	**Microeconomic Analysis**	**3**	**0**	**3**	**8**
Purpose and Content	The objective of the course is to introduce basic microeconomic concepts and theories and tools for microeconomic analysis. Introduction to microeconomics, basics of supply and demand; theory of consumer behavior; theory of producer behavior; analysis of competitive markets; imperfect markets; game theory and competitive strategy; markets for factor inputs; investment, time and capital markets; general equilibrium and economic efficiency; externalities and public goods.				
ARY704	**Macroeconomic Analysis**	**3**	**0**	**3**	**8**
Purpose and Content	The objective of course is to introduce major macroeconomic theories and approaches and usage of these theories and approaches in economic analysis. Introduction to macroeconomics; data of macroeconomics; Classical theory; unemployment; growth theory; business cycle theory; IS-LM model; Mundell–Fleming model; short-run tradeoff between inflation and unemployment; Aggregate Demand and Aggregate Supply Model, macroeconomic policy debates; microeconomic foundations of macroeconomics.				
ARY705	**Mathematics Of Population Science**	**3**	**0**	**3**	**8**
Purpose and Content	This course aims to teach students the basic concepts in demography, calculating demographic statistics, measuring mortality and fertility rates, life tables. Definition of demography, sources of demographic data, measures of mortality and fertility, life tables, stationary and stable population theory, population projections.				
ARY706	**Insurance Statistic**	**3**	**0**	**3**	**8**
Purpose and Content	To teach students basic models used in non-life insurance, and inform them about the types of the data and parameter estimation methods. Claim Number and Claim Amount Distributions,Methods Used to Obtain New Distribution, Parametric and Nonparametric Model Estimation, Goodness of fit tests, Total Claim Amount Process. Reinsurance and Reserve.				

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ARY707	**Mathematics Of Retirement**	**3**	**0**	**3**	**8**
Purpose and Content	To inform students about actuarial calculations of defined benefit pension plans, the effects of changes in valuation assumptions and experience gains and losses and Turkish Social Security System. Types of Pension Plans, Cost mehods, İnvestigation the effects of failure and changes of actuarial valuation assumptions, Actuarial Calculation of Social İnsurance.				
ARY708	**Financial Analysis**	**3**	**0**	**3**	**8**
Purpose and Content	The main aim of this course is; analyzing the financial statements of an enterprise with financial analysis techniques, interpreting the results of this analysis and thus making comments about the financial status and performance of the enterprise. In this course, the main and additional financial financial statements of the business, comparative tables analysis, percentage analysis, trend analysis, ratio analysis, financial planning and audit topics are included.				
ARY709	**Actuarial Risk Theory**	**3**	**0**	**3**	**8**
Purpose and Content	The aim of this course is to define actuarial probabilistic models, to comprehend and apply premium calculation, security loading and reserve theory, to examine the effect of inflation, to comprehend the theory of ruin, and to examine articles on these issues in recent years. Collective risk model: Properties of compound distributions, Panjer recursion, approximations of the collective risk model, compound Poisson distribution Individual risk model: exact distribution using convolution, exact distribution using the De Pril recursion, security loading; reserve, the effect of inflation, risk measures: some premium-based risk measures, some capital-based risk measures,Value-at-Risk (VaR), conditional tail expectation and related measures,ruin theory.				
ARY710	**Applied Econometrics**	**3**	**0**	**3**	**8**
Purpose and Content	To teach; non linear, discrete chpoice , time series and panel data models. And using econometric software to estime those models. Non-linear regression model, qualitative regression models, Panal data models, Dynamic econometric models, simultaneous equation models, time series models				
ARY711	**Financial Derivative Products**	**3**	**0**	**3**	**8**
Purpose and Content	The main aim of this course is to introduce students to the basic concepts and methods that are required to be applied in financial risk management, as well as financial tools used in risk management. Financial risk management in businesses, methods used in financial risk analysis.				

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ARY712	**Stochastic Processes**	**3**	**0**	**3**	**8**
Purpose and Content	The aim of this course is to provide students with general information about stochastic processes and to apply the basic concepts of the theory of stochastic processes to problems in the actuarial field. The concept of stochastic processes, finite-dimensional distributions of stochastic processes, deterministic characteristics of stochastic processes, Poisson process, Compound and Inhomogeneous Poisson processes, Wiener Process, Markov Processes and Markov Chain.				
ARY713	**Globalization and Current Economic Problems**	**3**	**0**	**3**	**8**
Purpose and Content	The aim of this course is to understand the concept of globalization, to understand the commercial and financial liberalization policies applied in the globalization process. Globalization definition and scope, historical development of globalization, approaches to globalization, globalization, basic dynamics, trade liberalization and trade deficits, the theoretical foundations of commercial liberalization, new trade liberalization theories, criticisms aimed at trade liberalization, trade liberalization historical development of Turkey's economy, financial liberalization and financial openness , pre-1980 historical development of financial liberalization in Turkey's economy after the 1980 financial liberalization historical development of Turkey's economy.				
ARY714	**Data Analysis**	**3**	**0**	**3**	**8**
Purpose and Content	This course enables students to solve problems that require statistical techniques; establish a prediction model, the relationship between the variables in the model calculations, analyze parametric and non-parametric techniques are taught and interpret. Regression and correlation analysis, one-way ANOVA, two-way analysis of variance, k-square analysis, one- and two-sample for the Kolmogorov-Smirnov goodness of fit test, Mann - Whitney U test, Wilcoxon signed rank test for dependent on two samples, k independent sample tests,dependent k sample tests and Spearman rank correlation coefficient.				
ARY715	**Probability Theory**	**3**	**0**	**3**	**8**

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Purpose and Content	Aims of this course, to introduce basic probability concepts. To provide information about moments and generating functions which are used to determine a distribution theoretically. To teach how to obtain probability and distribution functions of two-dimensional random variables. To introduce some of the methods used to determine the distributions of functions of random variables. To give some information about limit theorems and sampling distributions used in the theoretical inference. Basic probability concepts, Random variables, Expected value and moments, Moment generating functions, Functions of random variables and their distributions, Joint and conditional distributions, Sum of random variables, Transformation of random variables, Order statistics, Probability inequalities and limit laws, Sampling distributions, Chi-square distribution,Student?s t distribution, F distribution.				
ARY716	**Statistical Decision Making**	**3**	**0**	**3**	**8**
Purpose and Content	This course aims to introduce decision making techniques for business issues by using statistical methods and models. The first part of this course includes data visualization and summarization, probability distributions, sampling distributions and estimation, hypothesis testing and statistical inference topics. The second part of this course includes regression analysis, devoloping and using decision making models, risk analysis and Monte Carlo simulation.				
ARY717	**Quality Management**	**3**	**0**	**3**	**8**
Purpose and Content	Getting general knowledge about Quality and Total Quality Management, getting information about Total Quality Management Application Process and Quality Methods. 1. The Concept of Quality and the Development of History of the Quality Management, 2. The Basic Properties and Aims of Total Quality Management (TQM), 3. Continuous Development (Kaizen), 4. Quality Control Circles, 5. Statistical Quality Control Techniques (Basic Statistics Techniques), 6. Application Process of Total Quality Management: Strategic Planning, 7. Benchmarking, JIT (Just-In-Time), Kanban and Poka-Yoke, 8. Performance Evaluation and Quality Awards 9. The Six Sigma Methodology.				
ARY718	**Life models**	**3**	**0**	**3**	**8**

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Purpose and Content	This course aims students to learn the distribution of random future lifetime, parametric survival models, life tables, non-parametric estimators, Cox regression model, Markov models. Distribution and survival function of random future lifetime, parametric survival models, life tables, life tables: fractional ages assumptions, non-parametric estimators, Cox regression model, Markov models.				
LUEE701	**Scientific Research Techniques and Science Ethics**	**3**	**0**	**3**	**8**
Purpose and Content	The course aims to provide information on how to conduct academic research, the scientific stages through which this research is completed, the methods and techniques to be used during this process, and the ethical principles that need to be followed.				
ARY797	**Graduate Seminar**	**0**	**2**	**0**	**6**
Purpose and Content	The seminar course is a practical class designed for graduate students under the supervision of a faculty member. It involves conducting comprehensive research on a certain topic related to their thesis area, compiling this research into a report, and presenting the findings orally.				
ARY7098D	**Course Specialised Field**	4	0	0	4
Purpose and Content	Course Specialised Field is a theoretical course proposed by a faculty member to share their knowledge, experience, and expertise in their scientific field with graduate students under their supervision. This course aims to educate students on scientific ethics and instil a strong work discipline.				
ARY7098T	**Thesis Specialised Field**	4	0	0	4
Purpose and Content	Thesis Specialised Field is a theoretical course that the faculty member proposes to the graduate students he/she supervises in order to share the methods of conducting research in the current literature, following and evaluating the literature, and to establish and carry out the scientific foundations of the student's thesis / exhibition / project work.				
ARY799	**Master's Thesis Study**	**0**	**1**	**0**	**26**
Purpose and Content	The Thesis Course is a practical class designed for graduate students under the supervision of a faculty member. It includes guidance on various aspects of their thesis work, such as literature review, methodology, fieldwork, and laboratory research. This course provides the necessary information and direction for the students to prepare their theses following the "Graduate Thesis Writing Guidelines and Templates," as well as guidance on defending and submitting their theses.				

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