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وصف لمحتوى مقررات التحليل الكمي المساندة باللغة الإنجليزية

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QUA 107 Introduction to Statistics in Business (3hrs)

Basic concepts – statistical data – population and random sample - sampling methods – collecting data methods - the questionnaire – tabular and graphical presentation of data – measures of central tendency – measures of dispersion – definition of probability - probability axioms - probability space - conditional probability – independent events - addition and multiplication rules - Bayes theorem – random variables and probability distributions – simple regression and coloration - time series(general trend equation) – index numbers. (Suitable software packages are used)

QUA 204 Linear Algebra in Business (3hrs)

Brief review of matrices and their operations - Vector Space: definition of vector space - linear independence and dependence – basis – dimension – orthogonality - dot and vector product - Matrices: rank - elementary row and column operations and their use in finding rank, inverse and solving linear equations systems - Matrix Partitions - Eigenvalues and Eigenvectors. Quadratic forms - Differentiation of the matrices. **Prerequisite Math 140**

QUA 205 Statistical Data analysis (3hrs)

Data measurements- questionnaire design – methods of collecting field data - automation of data: entering, tabulating and transforming data – representing data graphically - methods of data analysis - methods of statistical inference (review) - multivariate data analysis: multivariate logistic analysis - principal components - factor analysis - discriminant and classification analysis - cluster analysis - using SPSS software in data analysis. **Prerequisite QUA 107**

QUA 207 Business Statistics (3hrs)

Brief review of probability and distributions with emphasis on the normal distribution - sampling distributions for the mean, proportion, variance, difference between two means, and difference between two proportions - Estimation of population parameters - Point estimation and interval estimation for the mean, proportion, variance, difference between two means difference between two proportions, and the ratio of two variances - Tests of statistical hypotheses: basic definitions – testing hypothesis about the mean , proportion, difference between two means, difference between two proportions, variance, the ratio of two variances. (Suitable software packages are used) **Prerequisite QUA 107**

QUA 307 Business Forecasting (3hr)

Introduction to forecasting (its importance, usage and problems) - Forecasting methods: moving averaging methods – exponential smoothing methods (simple, double and triple) – ARMA,ARIMA models for stationary and nonstationary time series including estimation of parameters of the model, diagnostic checking and use of the model in forecasting time series. (Suitable software packages are used) **Prerequisite QUA 207**

QUA 407 Systems Simulation (3hr)

Concepts and basic principles in simulation systems - development methodology for system simulation – applications for simulation systems in solving problem and decision making - role of the data in the simulation systems - modelling systems and its use in simulation systems – use of the electronic tables in simulation systems - software in simulation systems – case study in simulation systems.

QUA 127 Mathematics of Finance (3hr)

Introduction and definitions - the general law of simple interest –true and commercial interest – present value and discount-the sum of annuities-certain using fixed and variable simple interest rates- some practical applications on simple interest including methods of redemption of short term loans, modification of loans and saving accounts. The general law of compound interest: the sum, present values and discount –the nominal rate of compound interest – the calculation of the sum and present value of annuities –certain with fixed and variable compound rates of interest-some practical applications on compound interest including methods of redemption of long term loans, modification of loans and redeemable securities.

QUA 227 Actuarial Statistics (3hr)

The relation between independent death rates – calculation of death rates from first principles – exposed to risk theorem : the different kinds of rate intervals and death rates in each case – calculation of death rates by census method – applications of methods of calculation of death rates in practice – dependent rates and its relation with independent rates – multiple decrement tables : the use of the exposed risk theorem in constructing these tables – different sickness rates and relations between them.

QUA 327 Mathematics of Insurance (3hr)

Different kinds of life insurance policies – probabilities and its application in the fields of death and survival – mathematical expectation – life expectation and average life – life tables and its application in calculating probabilities – present value of level, increasing and decreasing life annuities – net single premium for different policies – net annual premium for different policies- gross premium – limited payment premiums – actuarial reserves by prospective and retrospective methods.

QUA 217   Management Science (1) (3hrs)

An introduction to Operations Research for solving managerial problems and the concept of model building. Basic concepts of linear programming and its economic and managerial applications in the allocation of resources and investment planning; general formulation, graphical solution, the simplex method, the transportation problem, duality theorem, shadow prices, the principle of complementarily, sensitivity analysis to parameters of the program: the lower limit of decreasing resources and the upper limit of increasing them without affecting shadow prices, the lower limit of decreasing the profit and the upper limit of increasing it without affecting the optimal production planning, economic interpretation. (Software packages are used).
Prerequisite QUA 107

QUA 317   Management Science (2) (3hrs)

Basic concepts and managerial application to methods in mathematical programming. It includes the following topics: Integer programming, multi-objectives programming, goal programming, Dynamic programming and nonlinear programming. (Suitable software packages are used).
Prerequisite QUA 217.