Faculty of Technology

The Institute of Technology and Business in České Budějovice

Thematic Areas for State Final Examination

Follow-Up Master´s Degree – Study Programme: **Logistics**

Applicable to the Following Recommended Study Plans: DP_LOG_P_č.1, DP_LOG_K_č.1

State Final Examination in: **Management and Modelling of Logistics Systems**

Thematic Areas for State Final Examination

Study programme:	Logistics
State Final Examination in:	Management and Modelling of Logistics Systems

Prerequisites for State Final Examination:	Decision Theory Systems Analysis and Modelling Project Preparation and Management

Approved by the Programme Guarantor:	doc. Ing. Rudolf Kampf, Ph.D.	**Signature:**	

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Effective from:	Academic Year 2021/2022
Valid until:	Revocation

Thematic Areas

1. Probability Distribution (classical, statistical probability, parameters, alternative distribution, binomial distribution, Poisson distribution, hypergeometric distribution, exponential distribution, uniform distribution, normal distribution, standard normal distribution, student's distribution, chi-square distribution).

2. Probabilistic and Decision Trees (composition, explanatory power, methods of determining probabilities in relation to trees).

3. Decision-Making under Certainty, Risks and Uncertainties (ways and methods of identifying risks, relationship between risk and uncertainty, relationship between benefit, risk and uncertainty).

4. Methods of Linear Programming (graphical method of problem-solving within a single objective function and multiple objective functions, characteristics of the objective function and its nature, fundamental differences between rationalization and optimization).

5. Simplex Method (procedure and solutions related to minimization and maximization criteria, solutions in terms of multiple objective functions).

6. Multi-Criteria Evaluation of Variants (more complex methods of determining criteria weights, panel methods of determining criteria weights, subjective and objective probability).

7. DEA Method (CCR and BCC models, constant returns to scale, variable returns to scale, primary and dual mathematical model when applying minimization and maximization criteria).

8. Simulation (differences between methods of applied mathematics and simulation, explanatory power in professional logistics practice, simulation techniques and modelling).

9. Utility Theory (certainty equivalent, mean value, expected mean value and variances related to solving the minimization and maximization criteria, characterization of risk attitude, determination of maximum insurance against risk, maximization of future utility).

10. Multi-Criteria Evaluation of Variants (simple methods of determining weights, simple methods of multi-criteria evaluation of variants, multi-criteria programming, dominated and non-dominated variants, ideal and basal variants).

11. Game Theory (single-matrix and multi-matrix games, importance of game theory in logistics, guaranteed profit, cooperation and non-cooperation in game theory, cartel agreements, determination of probabilities in strategies, reaction curves).

12. Optimization - Mathematical Techniques in Logistics (differences between model and method, individual stages of investigation within applied mathematics / statistics).

13. Optimization Process of Logistics in the Market Position of Monopoly and Oligopoly.

14. Theory of Mass Service (models of mass service, optimization in models of mass service, characteristics of statistical distribution in relation to theory of mass service).

15. Phases of Project Life Cycle (pre-project activities, investment and implementation phases, operational phase, closure).

16. Project Management Resources and Tools (Gantt charts, network diagrams, project management).

17. Methods to Support Project Management (MS Project, CPM, PERT, Critical Chain Method).

18. Project Financing (financial resources, financial and economic project analysis, project finance management).

19. Project Risks and Risk Management, Project Changes (project risks, risk management, risk analysis).

20. Human Resource Management and Contract Management (human resources, contract management, types of contracts).

Recommended Literature

ALLEMAN, G. B. Performance-Based Project Management: Increasing the Probability of Project Success. Better World Books: Mishawaka, IN, U.S.A., 2014. 256 p. ISBN 978-0814433300.

DANTZIG, G.B. and THAPA, M.N. Linear Programming, 1st ed: Introduction, Springer, 1997.

GHIANI, G., LAPORTE, G. and MUSMANNO, R. Introduction to Logistics Systems Management. Second Edition. Wiley: A John Wiley and Sons, Ltd., Publication, 2013. ISBN 978-1-119-94338-9.

GOLINSKA, P. Logistics Operations, Supply Chain Management and Sustainability. Springer, 2014. ISBN 978-3-319-07286-9.

KOTLER, P. and KELLER, K. L. Marketing Management. 12th ed. Prague: Grada Publishing, 2008. 788 p. ISBN 80-247-1359-4.

LABADIE, N., PRINS, C. and PRODHON, C. Metaheuristics for Vehicle Routing Problems (Computer Engineering: Metaheuristics Set, 3). 1st ed. Wiley-ISTE, 2016, 194 p. ISBN 978-1-84821-811-6.

MATOUŠEK, J. and GARTNER, B. Understanding and Using Linear Programming, Springer, 2007.

OZCEYLAN, E. and GUPTA, S. M. Sustainable Production and Logistics: Modeling and Analysis. CRC Press (Taylor and Francis Group), 2021. 418 p. ISBN 9780367431303.

SIMCHI-LEVI, D., CHEN, X. and BRAMEL, J. The Logic of Logistics: Theory, Algorithms and Applications. 3rd Ed. Springer, 2013. ISBN 978-1-4614-9148-4.