Management (for students starting in 2024 or later)

1. The essence of mathematical statistics, the errors of sampling and inference, the steps of statistical processing
    - Interpretation of descriptive statistical indicators, properties of statistical indicators, main representation methods
    - Estimation theory, properties of estimation, interval estimation
    - The general course of hypothesis tests, statistical tests and their hypotheses, conditions for their application
    - Basics of correlation and regression calculations, basic assumptions of the model, interpretation and testing of indicators and regression coefficients
2. Management theories and methods, their application and criticism
    - What managerial skills and good and bad examples of their application do you know?
    - Describe the organizational culture types according to Handy and Quinn. How do organizational structures and culture types fit together?
    - Present the learned motivational theories and introduce application examples (theories of Maslow, Herzberg, McClelland, Vroom, Adams, Locke, and Skinner)
    - Describe the learned leadership styles and give examples of when it is recommended to use a given leadership style (theories of Lewin, Tannenbaum-Schmidt, Ohio State University, Blake-Mouton, and Hersey-Blanchard)
3. Segmentation, targeting and positioning and STP strategy
    - Describe the process and main characteristics of segmentation and list the segmentation criteria.
    - Describe the STP strategy, its process and present the dimensions of positioning in detail through examples
    - Using examples, explain the five positioning strategies.
    - Define the perceptual map and explain its application using an example of your choice
4. Ensuring quality in organizational operations
    - The main features of the current ISO 9000 family of standards
    - Characteristics of Six Sigma and Lean Six Sigma approaches
    - Organizational self-evaluation
5. Process management
    - Methods and tools for recording and monitoring processes (advantages, disadvantages)
    - Failure analysis methods (advantages, disadvantages)
    - Process improvement models: similarities, differences, criticisms
6. Management of customer demand and their satisfaction
    - Methods of forecasting customer demand and their application issues
    - Evaluation of demand forecast errors and their consequences for operation
    - Examination of the capacity to satisfy customer needs and its modification possibilities
7. Inventory and supply management
    - Types of inventory problems and the costs of the processes associated with them
    - Management dilemmas and models of inventory control
    - Tasks and solutions of material requirements planning

PRODUCT MANAGEMENT FINAL EXAMINATION

1. Product development (PD) models and process modelling
    - Different generations of PD based on McGrath's classification
    - Definition of the concepts of new product development (NPD) and integrated product development (IPD)
    - Comparison of the general project management life cycle approaches (predictive, iterative, incremental, agile) underlying NPD and IPD models
    - Linear (technology push and market pull), iterative NPD (chain-linked model, interactive model) and IPD models (e.g. Olsson, Roozenburg-Eekels model)
    - General purpose and PD relevance of process modelling

2. Ergonomics in product development
    - Definition, aim, and history of ergonomics (ergonomics of “scales and handles”, system ergonomics, product ergonomics, cognitive ergonomics, user experience and the era of universal design)
    - Different design strategies (Procrustes’s Bed, designing for the average, etc.)
    - Applying ergonomics in the different phases of product development
    - Characteristics of primary and secondary users and customers

3. General product management role and responsibilities
    - Evolution of the product management role
    - Value creation in product management (Ebert-Brinkkemper model)
    - Responsibilities of the product manager (Eriksson’s Venn diagram and related activities)

4 Product management of software
    - Evolution of software engineering (SE) (main milestones)
    - Software development lifecycle (SDLC) models and agile development approach
    - Evolution of human-computer interaction (HCI) (main milestones)
    - Integration of SE and HCI

5. The essence and techniques of design thinking

- Definition and models of design thinking (e.g. double diamond, IDEO)
- Definition of persona, steps to creating it and its practical application
- Definition of the user journey, steps to creating it and its practical application

6 Product experience and service design

- Definition and relationship of different terms (shopping experience (SX), product experience (PX), user experience (UX), customer experience (CX))
- Description of perceptual modalities and related psychological foundations associated with PX (perception, sensation, emotions, social relations)
- Definition of service design and its practical application

7. 'Design for all' in product management

- Definition of user groups with special needs (e.g. people with disabilities, children, elderly)
- Gap theory and its product development relevance
- 'Design for all' strategies
- Organizational benefits of 'design for all'

8. Types and classification of ergonomic research methodologies

- Definition of qualitative and quantitative research methodologies
- Definitions and types of analytical methods (heuristic evaluation, cognitive inference, etc.)
- Definition and grouping of empirical methodologies (Rohrer's 'cloud' classification, Maguire's process approach)

9. Questionnaires, interviews and focus groups applied to understand user needs

- Application and characteristics of the methodologies (advantages and disadvantages)
- Principles for designing questionnaires, interviews and focus groups
- Different types of questionnaires, interviews and focus groups

- Typical mistakes related to questionnaires, interviews and focus groups and ways to avoid them
- Sampling method and sample size
- Methods of data evaluation

10. Additional research methodologies: projective techniques, Q-methodology, and affinity diagram

- Application of projective techniques, Q-methodology, and affinity diagram (advantages and disadvantages)
- Aspects related to the design, implementation and evaluation of projective techniques, Q-methodology, and affinity diagram
- Methods of idea generation (brainstorming, brainwriting, SCAMPER, 'Six Thinking Hats' method) and idea selection (4-category method, now-how-wow matrix)

11. Methodology for usability testing of low-fidelity products

- Definition and relevance of sketches and wireframes in product development
- Primary concept and applicability of paper prototype testing (advantages, disadvantages)

12. Methodology for usability testing of high-fidelity products

- Definition and relevance of mockups and working prototypes in product development
- Definition of usability and user experience (UX)
- Conducting usability testing and related moderation techniques
- The think-aloud technique and its types (continuous, retrospective versions) used in usability testing
- Metrics applied in usability testing
- Questionnaires in usability testing (e.g. SUS)
- Eye-tracking usability testing (advantages, disadvantages), additional psychophysiological measurement tools

13. Ergonomic assessment and design of industrial workplaces and offices

- Risk assessment methods and supporting CAAA software for industrial workplaces and offices
- Anthropometric measurements as a basis for risk assessment and ergonomic design methods to improve efficiency
- Ergonomic aspects of different posturs, the phenomenon of RSI-CTD