INFORMATION

on the rules of classification for specialisation of the Engineering Manager Msc

The role of specialisation in training

After the first two semesters of the training programme, students continue their studies in a specialised subject area (specialisation). The two specialisation subjects related to specialisation are Master thesis 1 and Master thesis 2.

- Preparation of the ***Master thesis 1 and 2*** is an independent task, practical work, the content of which must be selected from the topics that belong to the specialisation. (With the permission of the specialisation coordinator, a thesis can be prepared in part by teamwork and theoretical research).
- The ***two specialisation subjects*** are closely related to the given subject area, the special expertise of which is transferred to the students, so these subjects must also be completed in connection with the specialisation.

The process of classification for specialisation

Only students who have completed at least 39 credits from the subjects of the first two semesters of the recommended curriculum of the training programme are eligible for specialisation. The prerequisite for each specialisation is the completion of the specified subjects:

- Environmental Management: Sustainable Environmental and Natural Resource Economics
- Management 4.0: Management and Quality Management
- Financial Management: Accounting
- Product Management: Applied Product Management

Classification for specialisation is done through the Neptune system. Each semester, the order of preference between specialisations must be specified in the time interval set in the system. **Classification for specialisation is made on the basis of the student's cumulative grade point average, including the academic results of the last semester.**[1] The result of the classification for specialisation will also be displayed in Neptune, no later than the first days of the registration week.

Specialisations of training

In the Engineering Manager Msc programme, students can choose from 4 specialisations. The professional work in the specialisations is supervised by a department. Within a specialisation, you can choose your own research topic typically from a wide range of topics appropriate to the profile of each department. The specific topic and the individual tasks are determined jointly by the departmental specialisation coordinators, the thesis advisors and the students.

- Environmental management specialisation
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[1] The averages are queried from the Neptune system, after the last day of the exam period of the given term, that is, after the grade entry deadline. We cannot take into account any change in the average due to missing or incorrectly recorded grades or any other reason, so please pay special attention to check these.

To dos classification for specialisation

Students can enroll in in subjects related to the specialisation after classification for specialisation. The Master Thesis 1 subject can only be registered by students who have already been assigned to a specialisation. Subject codes of the Master thesis 1 subject:

- Environmental management specialisation BMEGT42MN27
- Management 4.0 specialisation BMEGT20MN64
- Financial management specialisation BMEGT35MN34
- Product management specialisation BMEGT52MN44

Further information about the options available and how to choose a topic within the specialisations is provided by the specialisation coordinators.

ENVIRONMENTAL MANAGEMENT SPECIALISATION

The training objective of the environmental management specialisation is to provide complex environmental management knowledge, the practical application of which appears as an essential element of market competitiveness in the European Union, so also in Hungary as a member country. Participants of the training programme will have the necessary up-to-date theoretical and practical knowledge in both state administration and corporate and advisory practices. According to our surveys, there is considerable interest in our students graduating from the specialisation from both the corporate and advisory spheres of the state administration, the specific ministry, the Environmental Protection, Water Management and Nature Conservation Inspectorates, municipalities (in connection with the preparation of the environmental and local sustainability /LA 21/ programmes). These needs arise primarily in the preparation and implementation of tasks such as environmental management, environmental impact assessment, environmental audit, environmental reporting, environmental risk analysis, as well as the evaluation of projects with environmental impacts, environmental basis of decisions, etc.

Subjects of the environmental management specialisation:

Environmental Performance Evaluation (BMEGT42MN21)
The subject's objective is to familiarize students with basic enterprise environmental assessment techniques and methods. The subject discusses the macro-level methods of assessment, as well as the need and purpose of its corporate application, the applicability of each method and test results in corporate practice. It also studies the process of substance flow analysis of industrial metabolism that allows the linking of macro and micro relationships (Material Flow Accounting – MFA and chemical Substance Flow Analysis - SFA based on the MFA principle). It addresses the areas of applicability of System of Environmental Economic Accounting (SEEA). Topics displayed in further (macro and micro level) approach: the principle of material balance, the role of environmental costs and environmental indicators and their importance in assessment. Types and content (indicators) of environmental (sustainability) reports.

Sustainable Business Model Design (BMEGT42MN29)

The aim of the subject is to present the sustainability (environmental, social and economic) aspects of today's increasingly innovative business models in a practical way. It pays special attention to companies that apply business models that specifically set sustainability goals, the key objectives they target and the challenges that arise in their operations. Key stakeholders of businesses operating according to a sustainable business model, such as non-governmental organisations, companies and municipalities, will also be involved in the teaching of the subject. As a result of the course, students will be able to evaluate the business model of a business from a sustainability point of view, and they will be able to prepare their own sustainable business model.

Available topics for the master thesis prepared at the Department of Environmental Economics and Sustainability:

- **Regional aspects of sustainable development**: the shift towards sustainability transition should be addressed not only at the level of a player, but also at the level of corporate groups, local and regional governance as well as domestic and international non-governmental actors. A network of stakeholders involved in the implementation of any UN Sustainable Development Goal (SDG) can be studied for the subject area. The specialisation mostly includes the implementation of goals that require innovative technical solutions (e.g. sustainable production and consumption), but also includes the "greening" of settlements and the technical aspects of smart cities. The specificity of the topic is to take into account the primary role of the territorial dimension.
- **Energy economy and climate protection:** with the diploma thesis related to the subject, students can study the challenges and solutions related to the energy economy as a sector responsible for the extraction, conversion and distribution of energy carriers into secondary energy sources in the context of climate protection. The focus of the studies is on the energy

mix of countries and regions, the regulatory and resource management issues of the production of renewable energy sources, and the aspects of energy supply independence.

- **Sustainable mobility:** the dissertations written on the subject can cover a wide range of topics on sustainable mobility, the movement of people and goods, from the design of individual vehicles to the study of transport planning responsive to energy goals, resource-efficient and climate-friendly transport modes. Analyses can be carried out at local (e.g. sustainability issues of bicycle sharing systems), sub-regional and larger territorial levels. Sustainable mobility can also be the subject of an interesting diploma thesis from the point of view of energy economics and climate protection.
- **Sustainable corporate operation:** the topic is for different representatives of the corporate population by company size: small and medium-sized enterprises, large corporations; from the point of view of the owner: domestic or foreign (transnational and multinational) enterprises that operate in different sectors of the economy (agriculture and forestry, industry or service) support the examination of sustainable corporate operation. Issues of resource use, environmental factors and impacts, corporate environmental policy, environmental management systems.
- **Environmentally friendly consumption, sustainable lifestyle:** sustainable consumption is intrinsically linked to production and distribution, the use and redundancy of products and services: it is a basic condition for sustainable consumption that the entire life cycle of products be taken into account and rethought. The sustainability aspects of the supply side are linked to the creation, content, production technology, the energy used, transportation, packaging and thousands of other factors that affect the natural environment and people. On the demand side, information, behaviour and commitment, consumer awareness and consistency can be studied.
- **Environmental innovation, sustainable solutions**: environmental innovation and sustainable solutions are the tools of the sustainability transition, which include all processes, products and services that reduce adverse effects on the environment, provide a sustainable solution and use resources more efficiently. Eco-innovations are created in different industries, their creation involves significant research and development-innovation, knowledge-intensive solutions, the creation of which also contributes to economic development.
- **Environmental strategy and policy:** the focus of this subject area is on the regulatory framework and measures related to medium and long-term planning. Government measures and rules to promote sustainable environment and resource management. Multi-annual environmental action plans are decisive at global, EU and domestic levels, and are also integrated into horizontal (sectoral) strategies.

Examples of the topics for the master thesis in the Department of Environmental Economics and Sustainability:

- analysing, directing, influencing and coordinating environmental management processes,
- planning and analysing the environmental processes of organizations and institutions,
- coordinating and effectively developing other activities related to environmental protection (transport, energy, quality, etc.),
- studying resource management sustainability issues.

MANAGEMENT 4.0 SPECIALISATION

The training objective of the management 4.0 specialisation is to provide students with more in-depth knowledge in general and area-specific management fields, so that they can perform complex management tasks in their future workplace. The subjects of the specialisation and the optional master's thesis topics make it possible to deepen in each management area, thereby increasing and widening the employment opportunities of graduates.

Subjects of the management 4.0 specialisation:

Strategic Management (BMEGT20MN04)
Within the scope of the subject, students can get acquainted with the basics of strategic management and the most important basic contexts of related subject areas. The goal is, on the one hand, to provide students with an understanding of the essence of strategic thinking, and, on the other hand, to provide them with an understanding of the tools and methods of strategic management used worldwide.

Today's Quality Management Challenges (BMEGT20MN60)
The subject builds on knowledge in the field of quality management. It aims at illustrating the challenges faced by organizations in the practical implementation of traditional quality management concepts and approaches and in applying related methods and tools. It provides students with a comprehensive overview of their use, taking into account today's trends and a number of sector-specific characteristics. During the course, we will review the real impact of globalization, digitalisation, technological development, sustainability and changing customer expectations from a quality management perspective. The subject teaches how organizational performance can be improved today by using quality management models and tools.

Thesis topics (among others):

- **Business models in the digital economy.** Topics investigated in this area should focus on innovative ways of value creation, business strategy, organizational design and other elements of business models in the digital economy. These are mainly industries producing digital products such as music, film, books or more recently unique services such as e-sports, video games or more recently education. Special attention is given to two-sided markets or business platforms both in the business-to-comsumer or business-to-business markets.
- **Information management and digital transformation.** Information management covers the wide range of ICT (information communication technology) applications in business studying their implications on organizations, strategies, productivity and other areas. The MIS course in the curriculum is a key foundation to the research areas. Digital transformation covers all those managerial and leadership challenges which appear when ICT change business processes, organizational forms, or in general how business is being conducted.
- **Product and brand management.** Methods that support product and brand management decisions: product lifecycle models, product testing methods, product characteristics assessment, branding tools.
- **Product innovation process.** Development of marketing tools in product management policy, the role of marketing in product/service innovation. Management tools that support the development of a new product, market introduction.
- **Project management.** Problems of modern project management (core disciplinary or interdisciplinary aspects).
- **Process development.** Introduction of the examined sector/organization. Looking for problems, improvement opportunities and using process deelopment methods, tools (e.g. Ishikawa diagram, Pareto analysis, etc.) for the examination. Determining a solution plan with a monitoring system.
- **Customer value: analyzing and measuring value chain performance.** A value chain contains all the activities that take place within a company in order to deliver a valuable service or product

to the customers. In this topic, customer value can be defined and measured, the whole value chain and/or its activities can be identified and improved for higher customer value, customer value measurement issues can be analyzed, etc. Research can use the tools of service management, lean management, and operations management, but for an interdisciplinary approach, tools of other scientific disciplines can be used as well.

- **Lean management.** Introduce the theoretical background and application of lean management in the case of a production or service company. Describe the activities aimed at minimizing losses during the operation and formulate specific improvement proposals. Make recommendations for the monitoring and evaluation of the implemented developments.
- **Six Sigma.** Six Sigma program has been gradually spread since the 1990s and relies heavily on the tools of mathematical statistics. The task is to get acquainted with the Six Sigma methodology, to get involved in an implementation project at a specific company, and to solve independent tasks.
- **Technology Management:** Technology management is the cross-functional activity that harnesses technology to ensure the effective and efficient operation of an organisation. „Since 'knowing how things can be done' forms the basis from which a business sector meets customer needs, the choice of technology significantly influences the fundamental structure of the business sector. This is so closely intertwined with the core concept of the business that they must be considered together. A business without technology is obviously a meaningless concept" (Steele, 1989). This topic can explore areas such as technological life cycles, disruptive, stealth, underground, open, and deep-tech innovations, stage-gate and agile product development, dual-driven product innovation, process innovation, innovation and technology strategies, technology portfolio analysis, technology roadmapping, innovation and technology management audits, and core competency management.

Examples of the topics for the master thesis in the Department of Management and Business Economics:

- Project monitoring in reviewing the traffic regime of the M6-M60 motorway
- Study of the Hungarian construction industry, increasing productivity with digitalisation
- Corporate crisis management and crisis management strategy at a multinational company during COVID-19
- Monitoring the transition to agile operation at Magyar Telekom Nyrt.
- Study of the facility management of Budapest Airport Zrt.
- Analysis of the management issues of escape rooms as services
- Study and development of the measurement system of the packaging material production process
- Study of personnel management at MÁV-START Zrt.
- Time management of generic drug development projects
- Implementation of data visualization software in mystery shopping
- Application of machine learning to predict the risk of gastrointestinal bleeding

FINANCIAL MANAGEMENT SPECIALISATION

The training objective of the financial management specialisation is to provide theoretical and practical knowledge for corporate and banking financial decisions. Our primary goal is to transfer up-to-date and practical knowledge to engineering manager students, who will be able to use that well in the economic decision-shaping of companies. The project assignments and master thesis topics to be announced within the framework of the specialisation also cover areas related to the wider spectrum of finance, thereby reflecting on the dynamic movements and changes caused by markets and technology.

Subjects of the financial management specialisation:

Macro Finances (BMEGT35M106)
The main objective of the subject is to familiarize students with the main subfields of macroeconomic finance (fiscal policy, monetary policy, financial stability) and their context. During the presentation of fiscal policy, an overview of state functions, the tax system, balance indicators and public debt are highlighted. The central issue of monetary policy is price and exchange rate stability, inflation and the central bank's asset system, as well as money creation. The focus in financial stability is on ensuring that key financial markets and institutions are able to perform their main functions smoothly: intermediation of financial resources, risk management and payment processing.

Investments (BMEGT35M010)
The main objective of the subject is to familiarise students with the operation of stock markets and exchanges, institutions and indices on the market, the basic theoretical background and main methods of stock analysis, and the main portfolio management strategies. During the semester, a strong emphasis is placed on the methodology of fundamental analysis of stocks.

Available topics for the master thesis prepared at the Department of Finance:

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Examples of the topics of the master thesis in the Department of Finance:

- Economic analysis of investment projects
- Company valuation
- Investments
- Platform economics
- Corporate finance

PRODUCT MANAGEMENT SPECIALISATION

The training objective of the product management specialisation is to discuss product management tasks related to product development, keeping in mind user-centred planning at all times. The specialization aims at training prospective engineering managers who, based on their marketable, theoretical and methodological knowledge acquired there, can be involved in any stage of the product development processes of a wide variety of companies.

Subjects of the product management specialisation:

Methods in Ergonomics (BMEGT52MN28)
The basic objective of the subject is to learn and master user-oriented methods that can be used in product-life cycle processes. Topics:

- Fundamentals, development history, approach and methods of ergonomics. Product design steps and related ergonomic tasks. Involvement of users (participation).
- Understanding user needs: interview and questionnaire-based methods, focus group examination, projective techniques.
- Fundamentals of the Q-methodology for the objective examination of subjective belief systems.
- The KJ (Kawakita Jiro), also known as the Affinity Diagram, is an additional method to support human-centered product management.
- Empirical methods: An empirical study of product use (usability testing) in connection with various realistic prototypes. Eye movement tracking.
- Ergonomic evaluation and planning of workplace environments. Computer Aided Anthropometric Assessment (CAAA). Risk analysis.

Human-centered Product Management (BMEGT52MN42)
The fundamental objective of the subject is to learn and process human-oriented product management opportunities that can be used in various industrial practices through individual task solutions. Topics:

- Human-centred product management and ergonomics-focused product development
- The role of User Experience (UX) design in software development
- Design thinking and related techniques (persona creation, user journey practice)
- Product experience and service design
- Designing for special users and human-centred product management aspects

Available topics for master the thesis prepared at the Department of Ergonomics and Psychology:

- **Product Management:** Product management includes all management tasks related to the development, implementation, introduction and market success of a product, product group or product family, thus supporting the process of product innovation from strategic product planning (defining corporate goals, brainstorming, choosing a new business idea) to the actual implementation of the product. In human-oriented product management, the human factor (taking into account ergonomic aspects, user-oriented product design aspect, understanding consumer needs) has a prominent role, which helps to determine the product advantages that marketing can communicate to consumers at different stages of the product life cycle curve.
- **Software ergonomics:** Software ergonomics covers user compliance of various IT products and systems, focusing on identifying user needs and incorporating them into development processes in order to improve usability problems and enhance the overall user experience (User eXperience, UX).
- **Workplace ergonomics:** Workplace ergonomics deals with the ergonomic evaluation and development of various industrial, office and other workplace environments.

- **Service development:** Service development refers to the approach of user-oriented service design, where user needs are collected in order to realize the development of the service process in a value-added way.

Examples of the topics for the master thesis in the Department of Ergonomics and Psychology:

- Investigation of user-oriented development opportunities of software products (e.g. websites, mobile applications)
- Human-centred introduction and further development of products (e.g. e-mobility tools, soft drinks, sports equipment, cosmetics) and services (e.g. borrowing, board game relocation, event organization)
- Ergonomic evaluation and development of industrial (e.g. assembly lines, workstations), office and other workplace environments (e.g. restaurants, cafes, sports centres)
- Further development of products (e.g. aids) related to special users (e.g. disabled users) and study of workplace environments (e.g. accessibility issues)