Quality Management and Control of Industrial Systems

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Faculty	Faculty of Materials Science and Technology
Type of study	Follow-up Master
Language of instruction	English
Code of the programme	N0413A270003
Regular period of the study	2 years
Cost	50,000 CZK per semester
Coordinating department	Department of Industrial Systems Management
Coordinator	prof. Ing. Kamila Janovská, Ph.D.
Keywords	intelligent control, quality management, industrial systems, industrial statistics, business economics

About study programme

The aim of the study program Quality Management and Control of Industrial Systems is to educate middle and top managers of manufacturing companies, design, research, development and other specialized institutions, especially for the industrial sphere of metallurgy and mechanical engineering, in relation to the automotive industry. The study is based on a balanced synergistic combination of quality management knowledge, managerial and economic knowledge and knowledge of modern control, information and communication technologies. Graduates of the study program will find employment as quality managers or quality engineers, as specialists in the field of process control using progressive control, information and communication technologies, and in a number of management functions at various levels of organization management.

Graduate's employment

Graduates of the Quality Management and Control of Industrial Systems program will find employment especially in manufacturing organizations, but also in non-manufacturing organizations, such as engineering or business. They work as quality managers or quality engineers in various industries. They will also find employment in the field of modernization of process control using progressive control, information and communication technologies, as well as in the creation and use of advanced information and communication technologies and in the implementation and administration of business management and information systems. They will also find employment in specialist positions for the application of selected methods of quality management and industrial systems management and data analysis and in a number of management functions at various levels of organization management.

Study aims

The aim of the study program Quality Management and Control of Industrial Systems is to educate middle and top managers of manufacturing companies, design, research, development and other specialized institutions, especially for the industrial sphere of metallurgy and mechanical engineering, in relation to the automotive industry. The study is based on a balanced synergistic combination of quality management knowledge, managerial-economic knowledge and modern control, information and communication technologies. This knowledge and skills create the prerequisites for executing managerial positions in the context of advancing automation, robotics and manufacturing within the Industry 4.0 concept.

Graduate's knowledge

Graduates of study program:
- demonstrate knowledge of the nature of industrial technology management with an emphasis on knowledge interdisciplinarity;
- demonstrate knowledge of advanced concepts, approaches, methods and tools of modern quality management;

• demonstrate knowledge of quality planning and quality improvement methods;
• demonstrate knowledge of selected statistical methods for quality management and industrial systems management;
• know the principles, methods and tools of the business economy and advanced management of economic systems in the area of industrial technologies;
• know the financial and economic management of an industrial enterprise and its links to the business environment;
• demonstrate knowledge of conventional and unconventional modeling methods, technical measurement and experimental methods, and optimal control;
• demonstrate knowledge of the principles of complex industrial systems control based on programmable logic controllers, enterprise information systems and modern management methods including artificial intelligence methods.

Graduate's skills

Graduates of the study program are able independently and creatively:
• to solve aspects of the development of advanced quality management systems, including the application of the special requirements of different industries;
• to apply on the basis of knowledge of the nature of industrial technologies, especially metallurgical, engineering and automotive industry, tools from the area of quality management and economic and financial management of the company;
• to draw up a business entity strategy and a strategy for quality planning and improvement;
• to select and apply appropriate methods of planning and improving the quality of products and processes;
• to select and apply appropriate statistical methods for quality management and industrial systems management;
• to apply tools from the area of economic and financial management of the company;
• to participate in teamwork, but also lead creative teams in solving industrial management problems on an industrial-application and basic research;
• to propose an optimal arrangement of machines and fixtures, material flow, continuity of workplaces in terms of their management and information and communication interconnection;
• to monitor technological processes and develop analyzes and innovation concepts of inspection and control systems according to the needs of industrial processes;
• to perform advanced analyzes, design and implementation of industrial process control systems for industrial companies through the application of modern computer, measurement and automation tools.

Graduate's general competence

Graduates possess general competencies to the extent defined by national descriptors of the Czech qualification framework with an emphasis on communication, management and organizational skills, communication in at least one foreign language, etc. Graduates are prepared to creatively solve theoretical and practical aspects of advanced quality management systems, independently decide about the application of appropriate methods and tools of quality planning and quality improvement and statistical methods. They understand the essence of industrial enterprise economics, they have an overview of strategy creation, management, processes in industrial enterprise, approaches to management and financing of enterprise and about monitoring and evaluation of its economic activity. They are able to analyze complex production, technological and information systems, design their control using modern control, information and communication means and methods. They master methods for parameterizing control systems in accordance with the needs of industrial and enterprise processes.

Professions

- Quality manager
- Automation systems specialist
- Quality engineer
- Industrial data analyst
- Quality inspector
- Process management specialist

- Auditor of quality management systems
- Industrial engineer
- Quality control specialist
- Economist in manufacturing company
- Enterprise information systems specialist

Hard skills

- Production quality management
- Knowledge in the field of production technologies
- Financial instruments
- Industrial automation
- Quality control
- Statistical methods of quality management
- Business administration
- Evaluation of production and pre-production processes
- Methods and tools of quality management
- Statistical methods
- Procedures and methods of quality planning
- Orientation in regulations, legislation for metrology, quality for the Czech Republic, and legislation common in the Union
- Production organization and management
- Applied informatics and management
- Knowledge of quality monitoring and evaluation
- Managerial knowledge
- Change management
- Quality management systems
- Computer support for quality management
- Quality management

Study curriculum

- form Full-time (en)