# BOOK OF COURSES

# STUDY PROGRAM: **ENGINEERING MANAGEMENT**

# MASTER ACADEMIC STUDIES
## (2<sup>ND</sup> LEVEL OF THE ACADEMIC STUDIES)

Bor, 2023.

# List of courses:

# 01. Management

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|---|---|
| **Study program:** Engineering Management | |
| **Course: MANAGEMENT** | |
| **Lecturer/s:** Marija V. Panić | |
| **Status of the course:** Compulsory | |
| **ECTS: 7** | |
| **Prerequisite:** | |
| According to the first-degree study program, knowledge in basics of management, strategic management, and project management is required. | |
| **Course goals:** | |
| Familiarity with the basic laws and organization of the business and mastering the basic economic principles of modern entrepreneurship. | |
| **Learning outcomes:** | |
| Achieving the level of knowledge required for successful participation in the organization of business processes in manufacturing and non-manufacturing companies. The possibility of doing business while respecting modern economic principles. | |
| **Course description:** | |
| *Lectures:* | |
| Introduction to management and work organization. Management yesterday and today. Organizational culture and environment. Management in a global environment. Social responsibility and ethics of managers. Decision-making - the essence of managerial work. Basics of planning. Strategic management, planning tools, and techniques. Organizational structure and design. Communication and information technologies. Change and innovation management. Basics of behavior. Understanding groups and teams. Motivating employees. Leadership. Basics of control. Business and value chain management. | |
| **Literature:** | |
| Recommended: | |

Recommended:

1. Robbins S. P., Coulter M., Management, Data Status, Belgrade, 2005.

Ancillary:
2. Certo S., Modern Management (International Edition), Data Status, Beograd, 2003.
3. Cole G., Management Theory and Practice, Middlesax University, 2004.
4. Weihrich M. A., Koontz H., Menadžment, Mate, Zagreb, 1998.

| **Number of classes per week** | **Lectures: 2** | **Practical classes: 0** | **Study research work: 2** | **Other forms of teaching: /** |
|---|---|---|---|---|

| **Teaching methods** |
|---|
| Theoretical teaching of the frontal type with practical examples within group, individual, and combined teaching methods |

| **Knowledge evaluation (maximum 100 points)** | | | | |
|---|---|---|---|---|
| **Pre-examination obligations** | Points | **Final exam** | Points |
| Lecture attendance | **10** | Written  part of the final exam | |
| Exercise attendance | | Oral part of the final exam | **60** |
| Coloquium exam/s | **20** | .......... | |
| Term paper | **10** | | |

## 02. Logistics

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|---|---|
| **Study program:** Engineering Management | |
| **Course:** Logistics | |
| **Lecturer/s: Nenad N. Milijić** | |
| **Status of the course:** Compulsory for students of Engineering Management | |
| **ECTS: 8** | |
| **Prerequisite:** Acquired basic knowledge in the field of Production Management, Operational Research, Work Process Management and Quality Management | |
| **Course goals:** Acquiring the necessary knowledge in logistics process management in modern business and production systems with the support of modern information and communication technologies. | |
| **Learning outcomes:** Through classes, students are prepared to apply modern tools for planning and managing logistics processes in complex industrial systems with the support of ICT. | |

**Course description:**

Lectures:

Logistics system in enterprises; logistic processes and organization of production; ensuring the procurement of materials; models for optimization of material orders and inventory management; space for storage of materials; internal and interoperation transport and material flow; packaging, storage and distribution of final products; means of transport in the industrial logistics system; transport issue; using ICT to improve logistics processes; support for logistics processes with the help of the ERP system; reverse logistics

Practice:

As part of practical classes, students solve numerous practical examples from the field they listened to in lectures. Solving practical examples is based on computational examples and computer simulations. In addition, students are presented with case studies based on practical challenges in a real business environment. Students also produce a study research paper, in the form of a seminar paper, which they defend during the public presentation. Also, as part of the practice classes (2 hours per week), the operational plan envisages the realization of SAP/ERP exercises from 9 to 11 working week in the autumn semester. Through the SAP/ERP module Warehouse Management (WM), students will consider in detail through special units (case studies) four different logistics processes in the management of material and information flows in one warehouse.

**Literature:**

Recommended:

1. Ivan Mihajlović, Production Logistics (In Serbian), Technical Faculty, Bor, 2008.
2. D.J. Bloomerg, S. LeMay, J.B. Hanna, Logistics, Mate, Zagreb, 2006.
3. Articles in international journals

Ancillary:

1.
2.

| Number of classes per week | Lectures: 2 | Practical classes: 2 | Study research work: 2 | Other forms of teaching: |
|---|---|---|---|---|

**Teaching methods**

The theoretical part of the teaching is conducted in the classroom with the use of modern technological aids. In the theoretical part of the class, students are introduced to the theoretical foundations of the subject, and then in the theoretical exercises, applied knowledge on concrete examples in the form of calculation exercises, case studies, and analysis. In addition, for part of the term of the exercises, students work on the computer applying adequate software tools for the optimization of logistics processes.

**Knowledge evaluation (maximum 100 points)**

| Pre-examination obligations | Points | Final exam | Points |
|---|---|---|---|
| Lecture attendance | **10** | Written part of the final exam | |
| Exercise attendance | **10** | Oral part of the final exam | **40** |
| Coloquium exam/s | **30** | .......... | |
| Term paper | **10** | | |

## 03. Electronic Business

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|---|---|
| **Study program:** Engineering Management | |
| **Course:** Electronic Business | |
| **Lecturer/s:** Sanela S. Arsić | |
| **Status of the course:** Elective for Engineering Management students | |
| **ECTS:** 7 | |
| **Prerequisite:** Acquired knowledge in the field of Information Technology,Ffinancial Management, and Economics Business. | |
| **Course goals:** The aim of this course is to enable students to master the knowledge and techniques of electronic business. | |
| **Learning outcomes:** The ability of students to independently use the acquired knowledge in the field of electronic business in different business areas and integrate them with ERP systems. | |

**Course**      **description:**

Lectures:

Introduction to electronic business: Importance of electronic business; History of the development of the e-business environment; Concept, definitions, and tendencies of e-business.

Information society: Virtual organizations, Basic characteristics of the information society; Advantages of the individual in the information society; Behavioral models according to industry needs information; The position of personnel in the information society.

Electronic business models: Forms of electronic business; Organization of the electronic trade model; Planning, development, and implementation of business models; Business to Business (B2B), Business to Consumer (B2C), Consumer to Business (C2B), Consumer to Consumer (C2C), Business to Employee (B2E), Employee to Business (E2B); Mobile business.

Electronic banking: Electronic payment transactions and electronic payment systems; Distributedness electronic banking; ATM and POS systems; Electronic business in public administration; Electronic commerce: Electronic store; Electronic basket; Coordination of ERP system and electronic business in order more efficient management of sales processes; Security in electronic business; Protection of information systems.

Practice:

In the lessons scheduled for exercises, teaching will be conducted on computers in the computer laboratory, whereby students will have the opportunity to master the creation of publications and internet presentations, create an electronic store, and master the creation of an e-business project and mobile business. Also, as part of the exercises (2 hours per week), the operational plan envisages the implementation of SAP/ERP exercises from 9 to 11 working weeks in the winter semester. Through the SAP/ERP module Sales and Distribution (SD), students will consider the detailed implementation of the sales process in an organization.

**Literature:**

Recommended:

1. Božidar Radenković, Marijana Despotović-Zrakić, Zorica Bogdanović, Dušan Barać, Aleksandra Labus. Electronic business. Faculty of Organizational Sciences, 2015.

Ancillary:

1. Vojkan Vasković, Srećko Stanković, Electronic business. Banja Luka, 2010.
2. Vojkan Vasković, Miroslav Lutovac, Electronic business. State University in Novi Pazar, 2009.
3. In Lee, Electronic Business: Concepts, Methodologies, Tools, and Applications, Information Science Reference, 2008.

| **Number of classes per week** | **Lectures: 2** | **Practical classes: 2** | **Study research work: 1** | **Other forms of teaching: /** |
|---|---|---|---|---|

**Teaching method**

Frontal type of lectures, PowerPoint presentations, analysis of case studies, work in groups, application of e-business models for solving practical problems, auditory exercises, and practical work in the computer laboratory.

**Knowledge evaluation (maximum 100 points)**

| **Pre-examination obligations** | Points | **Final exam** | Points |
|---|---|---|---|
| Lecture attendance | **5** | Written part of the final exam | |
| Exercise attendance | **5** | Oral part of the final exam | **50** |

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|---|---|---|---|
| Coloquium exam/s | **20** | .......... | |
| Term paper | **20** | | |

## 04. Management Control Systems

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| **Study program: Engineering Management** |
| **Course: Management Control Systems** |
| **Lecturer/s: Đorđe Nikolić** |
| **Status of the course:** Compulsory for the Engineering Management students |
| **ECTS: 7** |
| **Prerequisite:** Knowledge in Engineering Statistics, Systems Theory, Decision Theory, Business Process Management |
| **Course goals:** The aim of this course is to introduce to the students basic concepts of dynamic process modeling in organizations |
| **Learning outcomes:** Students will gain the knowledge and understandings of fundamental principles of mathematical models for discrete controlling systems, as well as critical awareness in using these models in order to solve management problems. Students will learn how to use spreadsheet scenarios for analyzing the process flows in the case of different business situations, also they will get competencies in explaining the obtained results of "what if" analysis based on the created simulation models. |
| **Course description:**<br>**Lectures:**<br>*Forecasting in business situations*: Forecasting future states; Qualitative vs. Quantitative forecasting methods; Time series; Components of time series; Time series methods; Trend analysis; Linear trend method; Annual growth rate method; Exponential smoothing methods; Holt's Exponential smoothing; Winter's Exponential Smoothing; Regression Analysis; *Modeling system dynamic*: Models, Decision models; Simulation models and simulation; Monte Carlo simulation; *Discrete systems control*; Modeling material flows; Spreadsheet simulation and optimization.<br><br>Practice:<br>The exercises correspond to the units covered in the lectures. Computational exercises are carried out in the computer lab where students enhance MS Excel spreadsheet skills and techniques. |
| **Literature:**<br>Recommended:<br>1. Dennis J. Sweeney, David R. Anderson, Thomas A. Williams, Jeff D. Camm, R. Kipp Martin, Quantitative Methods for Business, South-Western Cengage Learning, USA, 2009.<br><br>Ancillary:<br>1. Chung, C.A. , Simulation modeling handbook: a practical approach, CRC Press, (2004).<br>2. Winston, W.Y., Microsoft Excel 2010: Data Analysis and Business Modeling, Microsoft Press. (2011).<br>3. Banks, J., Carson, J.S., Nelson, B.L., Nicol, D.M., , Discrete-event system simulation 5th Edition, Prentice-Hall, (2010). |

| Number of classes per week | Lectures: 2 | Practical classes: 2 | Study research work: 1 | Other forms of teaching: / |
|---|---|---|---|---|
| **Teaching methods** | | | | |
| Lectures are delivered by combining classic format of teaching, group discussions and case studies. Computational exercises are realized in computer laboratories by demonstrating the adequate MS Excel spreadsheet tools to address specific problems. Students are doing homework and project assignments via e-Learning MOODLE platform. | | | | |

| Knowledge evaluation (maximum 100 points) | | | |
|---|---|---|---|
| **Pre-examination obligations** | Points | **Final exam** | Points |
| Lecture attendance | **10** | Written part of the final exam | |
| Exercise attendance | **10** | Oral part of the final exam | **30** |
| Coloquium exam/s | **40** | .......... | |
| Term paper | **10** | | |

## 05. Technological Forecasting

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|---|---|
| **Study program:** Engineering Management | |
| **Course:** Technological Forecasting | |
| **Lecturer/s: Nenad N. Milijić** | |
| **Status of the course:** Elective for Engineering Management students | |
| **ECTS: 8** | |
| **Prerequisite:** Previous knowledge from the subjects Management of new technologies and Strategic management. | |
| **Course goals:** Acquaintance of students with the essence, methods and technique of forecasting in the field of technology development, markets changes and other tendencies as an indispensable aspect of every manager's activity. | |
| **Learning outcomes:** After completing the course and passing the exam, the student is able to define the goal of technology forecasts, chooses a method-technique to perform the forecast, selects parameters and collects inputs data, evaluate the impact of external factors on the probability of the realization of the forecast, and to execute interpretation of the conducted analysis. | |

**Course description:**
Lectures:
An introduction to technological forecasting. Basic terms and definitions. Current approaches in forecasting: ontological (exploratory) and teleological (normative). Choice of forecasting method. Parameter selection and collection data for forecasting. Exploratory methods and forecasting techniques: brainstorming, delphi, morphological analysis and extrapolation trends. Normative techniques and forecasting methods: relevance tree and PATTERN methods. AHP method Expert Choice as computer support for forecasting. Interpretation of the forecast.

Practice:

Preparation of a seminar paper and its public presentation.

**Literature:**
Recommended:

1. M. Levi-Jakšić, S. Marinković, J. Petković, Management of Innovation and Technological Development (In Serbian), Faculty of organizational sciences, Belgrade, 2011.
2. Ayres, R., Technological Forecasting and Long-Range Planning, McGraw-Hill, 2007

Ancillary:

1. H. Linstone, M.Turoff, The Delphi Method - Techniques and Applications, University of Southern California, 2008.
2. Martino, J.P., Technological Forecasting for Decision Making, MeGraw-Hill, Ine., Thirt Edition, New York, USA, 1993.

| **Number of classes per week** | **Lectures: 2** | **Practical classes: 2** | **Study research work: 1** | **Other forms of teaching: ?** |
|---|---|---|---|---|

**Teaching methods**

Frontal type of lectures, work in groups, case studies, workshops, auditron exercises and practical work in computer laboratory.

**Knowledge evaluation (maximum 100 points)**

| **Pre-examination obligations** | Points | **Final exam** | Points |
|---|---|---|---|
| Lecture attendance | **5** | Written part of the final exam | **30** |
| Exercise attendance | **5** | Oral part of the final exam | **30** |
| Coloquium exam/s | **20** | .......... | |
| Term paper | **10** | | |

## 06. Strategic Management of New Technologies

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| **Study program:** Engineering Management | |
| **Course:** Strategic Management of New Technologies | |
| **Lecturer/s:** Isidora M. Milošević | |
| **Status of the course:** Elective for students of Engineering Management | |
| **ECTS:** 8 | |
| **Prerequisite:** Required knowledge of the basics of management, marketing and production management | |
| **Course goals:** The goal of the course is to familiarize students with the main elements of managing new technologies and innovations, as extremely important items for achieving, maintaining and strengthening competitive advantage at the company level, state, and overall technological development. | |
| **Learning outcomes:** Training students in the use of adequate techniques and knowledge for future professional activity in the field of managing new technologies and innovations. | |

**Course description:**

Lectures:

Basics of managing new technologies and innovations. Previous approaches to technological changes. Old and a new techno-economic paradigm. New technologies and high technologies. Specific and general areas of management of new technologies and innovations. The meaning of technology. Technology as an object of management. Types of technologies. Technology package and technology components. The concept of technological know-how. Fragmentation of technology. Nature, man, society, and technology. Science-technology-practice relationship. New technologies, employment, and employment. Management of changes in technology and organization. Reengineering and organizational changes. Integrative enterprise models, innovative organization models, and a comparative overview of management models. Technological evolution, organizational life cycle, and stages of new product/process development. Technological trajectories. Management of new technologies and productivity/organization/organizational structure. Technology transfer. Strategic and operational technology management. New technologies and company strategy. Models of enterprise technology strategy. New technologies and the market. Innovative organization. Technological innovations and commercialization of inventions. Classification of innovations (radical, evolutionary, architectural, component). Innovation models activities. Efficiency of innovation activity. The importance of innovative ability and knowledge management - concept of visible and invisible assets. New technologies and competitive advantage - Porter's generic strategies. The diamond of competitive advantage. Changing the techno-economic barrier of modern business. New technologies and globalization. Acceleration of technological changes. The new economy. Moore's law. Gazelle company. Capabilities and competencies of the company. Core competence. The root of competitive advantage. Appropriation of profits from innovation. Dynamic capabilities. Appropriability regimes. Copying and imitating. Innovation activity and SMEs. Knowledge management as the main competitive force of the XXI century. Key determinants and contributions of modern management of new technologies and innovations.


Practice:

Application of methods to support technology innovations in the company - methods and techniques of creative thinking, methods of technology evaluation, ranking and selection, and cases from practice.

**Literature:**

Recommended:

3.       J.Howells, The management of Innovation and Technology, Sage Publications, London, 2005.
4.


Ancillary:

4.   S.Shane, Handbook of Technology and Innovation Management, A John Wiley and Sons, Ltd., Chichester, 2008
5.


| Number of classes per week | Lectures: 2 | Practical classes: 2 | Study research work: | Other forms of teaching: |
|---|---|---|---|---|
| **Teaching methods** | | | | |

**Knowledge evaluation (maximum 100 points)**

| Pre-examination obligations | Points | Final exam | Points |
|---|---|---|---|
| Lecture attendance | **5** | Written  part of the final exam | **10** |

| | | | |
|---|---|---|---|
| Exercise attendance | **5** | Oral part of the final exam | **50** |
| Coloquium exam/s | **20** | .......... | |
| Term paper | **10** | | |

# 07. Production Systems

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|---|---|
| **Study program:** Engineering Management | |
| **Course:** Production Systems | |
| **Lecturer/s:** Snežana Urošević | |
| **Status of the course:** Elective | |
| **ECTS:** 8 | |
| **Prerequisite:** Subject knowledge: Mathematics I, Basics of management, Basics of business economics and Basics organizations. | |
| **Course goals:** The subject is directed towards a systematic consideration of the process of transformation of inputs into finished products and services in within different production systems. | |
| **Learning outcomes:** Students are trained to develop and design production systems, to recognize and understand the importance production system, production and service processes and acquire knowledge about the company as an integrated whole with connection of all functional elements. | |

**Course description:**

Lectures:

Basic elements of production and business systems. Subjects of production and business systems. Conditions of development production and business systems. Resources of business entities. Organizational structure of economic subjects. Service systems and service delivery. Product and production program. Intangible products, services, nature and way of experiencing. Work process and system capacity. General model of material flows. Organization of production systems. Designing the structures of production and business systems. Determination elements of the system. Development of production systems. Reengineering of business processes.

Practice:Exercises include auditory introduction of students to the studied issues, interactive processing of studies cases and computer examples and group work on the application of project tasks

**Literature:**

Recommended:

1. С. Урошевић, Р. Николић, Производно пословни системи, Дон Вас, Београд, 2012.

Ancillary:

1. Сајферт, М. Николић, Производно пословни системи, Технички факултет, Зрењанин, 2007.
2. М. Радовић, Производни системи, ФОН, Београд, 2007.
3. М. Радовић, Производни системи, производња, анализа и управљање, примери и задаци, ФОН, Београд, 2007.
4. Li, J.,  Meerkov, S. M. Production systems engineering. Springer Science & Business Media, 2008.

| Number of classes per week | Lectures: 2 | Practical classes: 2 | Study research work: 1 | Other forms of teaching: |
|---|---|---|---|---|
| **Teaching methods** Lectures are of an auditory nature with theoretical treatment of the required number of case studies. Exercises include auditory introduction of students to the studied issues, interactive processing of case studies and calculations for example, with the aim of practical mastery of system design tools and group work on project preparation tasks. Students work in small groups on a specific project assignment. | | | | |

**Knowledge evaluation (maximum 100 points)**

| Pre-examination obligations | Points | Final exam | Points |
|---|---|---|---|
| Lecture attendance | **5** | Written  part of the final exam | |
| Exercise attendance | **5** | Oral part of the final exam | **40** |
| Coloquium exam/s | **40** | .......... | |
| Term paper | **10** | | |

## 08. Portfolio Project Management

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|---|---|
| **Study program:** Engineering Management | |
| **Course: Portfolio Project Management** | |
| **Lecturer/s:**Dejan Bogdanović | |
| **Status of the course:** Elective for students on Master | |
| **ECTS: 8** | |
| **Prerequisite:** Previous knowledge in the field of Project management and Strategic management | |
| **Course goals:**    Acquiring the necessary knowledge and skills in the field of Portfolio Project Management. | |
| **Learning outcomes:** Use acquired knowledge in professional work and further professional development. Students will acquire knowledge in areas of optimization and portfolio creation, its maximum efficiency and benefits while minimizing costs. | |

**Course description:**

Lectures:

Single project management, Program management, Definitions of portfolio characteristics. Management portfolio. Analysis of portfolio value. Sources of information and how to interpret them. Definition of risk portfolio. Portfolio risk management instruments. Methods and techniques of the project portfolio. Multi-project enterprises. Multi-project culture. Multi-project management systems. Competence multi-project enterprise. Technical analysis. Concept and definition of investments. Investors - division i definition. Methods and models for the selection of projects in the portfolio. Case studies - portfolio formation and management.


Practice:

Preparation of a seminar paper and its public defense.

**Literature:**

Recommended:

5.  J. M. Nikolas, H. Steyn. Project management for engineering, business and technology. USA,  2012.
6.


Ancillary:

6.  J. Berk, P. DeMarzo, Corporate Finance, McGraw-Hill, 2008.
7.  A. Rosen, Effective IT Project Management, Macom, New York, 2004.


| **Number of classes per week** | **Lectures: 2** | **Practical classes: 2** | **Study research work: Yes** | **Other forms of teaching: ?** |
|---|---|---|---|---|

**Teaching methods**

     Frontal type of lectures, group work, case studies, workshops.

**Knowledge evaluation (maximum 100 points)**

| **Pre-examination obligations** | Points | **Final exam** | Points |
|---|---|---|---|
| Lecture attendance | **5** | Written  part of the final exam | **60** |
| Exercise attendance | **5** | Oral part of the final exam | |
| Coloquium exam/s | **20** | .......... | |
| Term paper | **10** | | |

# 09. Theoretical basics for creating a Master's thesis

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|---|---|
| **Study program: Engineering Management** | |
| **Course: Theoretical basics for creating a Master's thesis** | |
| **Lecturer/s:** Đorđe Nikolić | |
| **Status of the course:** Compulsory for Engineering Management students | |
| **ECTS: 8** | |
| **Prerequisite:** Knowledge in Engineering statistics | |
| **Course goals:** Defining and understanding the stages and structure of the Master Thesis. The focus of this course is to provide clear guidelines on how to firstly select and deploy proper quantitative methods considering different research problems, and afterwards how to perform reliable interpretation of the results. | |
| **Learning outcomes:** Students will acquire knowledge to: define the meaningful research problem; develop adequate research model and conduct its validation; gather and discuss research results; write and perform public presentation of master thesis. | |

**Course description:**

**Lectures:**

*Stages and structure of Master Thesis development:* 1. Defining research topic; 2. Research of the scientific literature (Kobson; Citation index database: Web of Science, Scopus, Scindex; Publishers of the scientific literature: Science Direct, Springer, Emerald, Elsevier); 3. Creating a research plan; 4. Research plan realization; 5. Writing the Master Thesis. U*nderstanding Quantitative Information*: Quantitative approach; Managing Data; Survey Methods. *Describing data:* Presentation of data; Measures of location; Measures of dispersion. Measuring uncertainty: Probability; Discrete probability distributions; The Normal distribution. *Using statistical inference:* Samples; Estimation; Confidence Intervals (t-test, z-test); Significance testing (One-Sample Hypothesis Tests, Two-Sample Hypothesis Tests); Significance testing (Analysis of variance, Factorial Analysis of Variance, General Linear Model (GLM); Multivariate Analysis); Non-parametric Test (Chi-squared tests, Mann-Whitney test). *Relating variables and predicting outcomes*: Correlation; Simple linear regression, Multiple regression analysis, Factor analysis, Cluster analysis. *Modeling*: Introduction to Structural Equation Modeling, Exploratory Factor Analysis, Confirmatory Factor Analysis, Path analysis.

**Practice:**

The exercises correspond to the units covered in the lectures. Computational exercises are carried out in the computer lab where students use the adequate software tools such as MS Excel and SPSS. Additionally, LISREL and SmartPLS software solutions will also be used to perform SEM analysis on selected case study examples.

**Literature:**

Recommended:

1. Wall, S., Coday, C., Mithchell, C., Quantitative methods for business and management, An Entrepreneurial Perspective, Pearson, 2014.
2. Wisniewski, M., Quantitative methods for decision makers (fifth edition), Prentice Hall, 2009.

Ancillary:

1. Sweeney, D. J., Anderson, D. R., Williams, T.A., Camm, J. D., Martin, R. K., Quantitative Methods for Business, South-Western Cengage Learning, USA, 2009.
2. R. Carver, J. Nash, Doing data analysis with SPSS, Brooks/Cole Cengage Learning, 2012.

| **Number of classes per week** | **Lectures: 2** | **Practical classes: 2** | **Study research work: 2** | **Other forms of teaching: /** |
|---|---|---|---|---|

**Teaching methods**

Lectures are delivered by combining classic format of teaching, group discussions and case studies. Computational exercises are realized in computer laboratories by demonstrating the adequate software tools to address specific problems. Students are doing homework and project assignments via e-Learning MOODLE platform.

**Knowledge evaluation (maximum 100 points)**

| **Pre-examination obligations** | Points | **Final exam** | Points |
|---|---|---|---|
| Lecture attendance | **5** | Written part of the final exam | |
| Exercise attendance | **5** | Oral part of the final exam | **40** |
| Coloquium exam/s | **40** | .......... | |
| Term paper | **10** | | |

## 10. Professional Practice

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|---|---|
| **Study program:** Engineering Management | |
| **Course:** Professional Practice | |
| **Lecturer/s:** Predrag Đorđević | |
| **Status of the course:** Compulsory for all students | |
| **ECTS: 6** | |
| **Prerequisite:** Enrolled in the second semester | |
| **Course goals:** Acquiring direct knowledge about the functioning of business systems, their organizational structure, the functioning of management and the achievement of business results. Adaptation of students to the business environment functioning in order to make it easier to integrate when starting a job after graduation. | |
| **Learning outcomes:** Training students for the practical application of previously acquired theoretical and professional knowledge in solving concrete practical engineering-managerial problems in a business environment. Acquainting students with activities of the company in which they conduct professional practice, as well as with its organizational structure, management structure, way of doing business and the role of the management in the functioning of the company. | |

**Course description:**

It is formed for each student separately in agreement with the management of the company in which professional practice is carried out, in accordance with the needs of the profession for which the student is being trained. The professional practice program for each student is defined by the teacher in charge - coordinator of professional practice in consultation with other teachers at the engineering management study program.
Students create and present a written diary describing their experiences during the professional practice.

**Literature:**

| Number of classes per week | Lectures: / | Practical classes: 6 | Study research work: ? | Other forms of teaching: ? |
|---|---|---|---|---|

**Teaching methods**

Professional practice in a company or institution is carried out in accordance with a pre-defined program containing tasks which consist of data collection - measurements and analysis, with consultation with experts from the company where professional practice was performed and a teacher-coordinator of professional practice. After completing professional practice, the student submits to the professional practice coordinator a written diary with a description of the activities and jobs performed within the practice. The teacher-coordinator confirms with a signature in the student's index that a student successfully completed professional practice.

**Knowledge evaluation (maximum 100 points)**

| Pre-examination obligations | Points | Final exam | Points |
|---|---|---|---|
| Lecture attendance | | Written part of the final exam | |
| Exercise attendance | | Oral part of the final exam | **100** |
| Coloquium exam/s | | .......... | |
| Term paper | | | |

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## 11. Master Thesis (Research Work)

| Study program: Engineering Management |
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| **Course: Master Thesis (Research Work)** |
| **Lecturer/s:** |
| **Status of the course:** Compulsory for all students |
| **ECTS: 5** |
| **Prerequisite:** Student should be enrolled in the seventh semester |
| **Course goals:** During the preparation and implementation of the research plan, the student works independently on a topic in the defined area of Engineering Management under the guidance of a teacher/mentor. The student's work on this subject foresees the analysis of one or more research questions using modern research methods, and then the interpretation and discussion of the achieved results. |
| **Learning outcomes:** By implementing the planned teaching activities in this subject, students should prove their ability to use scientific methods and research techniques at a higher level compared to the previous level of study. |
| **Course description:**<br>The topic of the final paper is determined by the mentor's proposal. A mentor can be any teacher who participated in the teaching process within maseter academic studies.  The topic of the work should be clearly defined, content-wise (in terms of volume), measured, and aligned with the student's ability to process the given topic at the appropriate professional level. By analyzing the relevant literature, the student becomes familiar with the methods of solving similar tasks and with the results achieved so far in the area of the subject of his final thesis.<br><br>It is necessary for the candidate, in agreement with the mentor, to precisely define the following: research problem, research subject, social and scientific goals, research hypotheses, research methods, and method of data processing and analysis.<br><br>The implementation of the defined research plan is carried out through the following stages: data collection, processing of the collected data, data analysis with the help of appropriate methods and techniques, and the formation of a final report on the obtained research results. |
| **Literature:**<br>Recommended:<br>Available library literature, search of scientific databases and services via KOBSON.<br><br><br>Ancillary: |

| Number of classes per week | Lectures: 0 | Practical classes: 0 | Study research work: 9 | Other forms of teaching: 0 |
|---|---|---|---|---|

| **Teaching methods** |
|---|
| During the research, the mentor gives the student the necessary instructions and also refers him to relevant professional literature in order to produce a high-quality final paper. If necessary, the student conducts measurements, tests, surveys, and other research within the scope of the assigned topic, as specified in the research plan. |

### Knowledge evaluation (maximum 100 points)

| Pre-examination obligations | Points | Final exam | Points |
|---|---|---|---|
| Lecture attendance | | Written  part of the final exam | |
| Exercise attendance | | Oral part of the final exam | |
| Coloquium exam/s | | .......... | |
| Term paper | | | |

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## 12. Master Thesis (Completing and Defending)

| | |
|---|---|
| **Study program: Engineering Management** | |
| **Course: Master Thesis (Completing and Defending)** | |
| **Lecturer/s:** | |
| **Status of the course:** Compulsory for all students | |
| **ECTS: 3** | |
| **Prerequisite:** All exams successfully passed and professional practice realized | |
| **Course goals:** The goal of the master work preparation and final examination is that the student should prove his/her ability to engage theoretical knowledge and adequate skills, developed through the courses, in solving some real time engineering practice challenges. This is also additional training for the student, which will increase his/her potential for practical application of gained knowledge in future business activities in the professional working environment. | |
| **Learning outcomes:** | |
| **Course description:**<br><br>The mentor for preparation and examination of the master thesis is to be selected by the student, among the professors engaged at the MSc courses, and based on his/her research field and teaching scope. After accepting to become a mentor, professor will have to provide consultative supervision of the students independent work on solving the research problem and preparation of the final text of the master thesis. After finishing the text of the thesis, and approval by the mentor, student will have to present and defend his/her master thesis in front of the examiners commission, consisted of at list three professors.<br>The subject of the master thesis is to be defined for each student individually, as the unique research task, from the following fields of engineering management: general management, logistics, e-business, technological predictions, strategic management of new technologies, production systems and project management.<br>After conducted research, student is preparing the master thesis in the format concluded with following chapters: introduction, theoretical part, experimental part, results and discussions, conclusions, literature. After finishing the work on the text of the master thesis and receiving positive opinion of the mentor, student is submitting three copies to the students office of technical faculty in Bor. After that, public presentation and examination, in front of the three member commission, can be arranged. | |
| **Literature:** | |

| Number of classes per week | Lectures: 0 | Practical classes: 0 | Study research work: 0 | Other forms of teaching: 4 |
|---|---|---|---|---|

**Teaching methods**

Consultations with selected mentor and defining the research scope. Defining the research subject. Collecting theoretical data and data analysis. Collecting the data for the practical research work, data and the data analysis in consultations with research target groups, experts from the companies, experimental measurements, etc. Analysis of obtained research results and preparing the discussions. Upon completion of the research work, student prepares the text of the master thesis and submits it to mentor. Improving and modifying the final text of the thesis, based on mentors' suggestions.

In addition to the general conditions for the defense of a master's thesis stipulated in the faculty's Rulebook on studying in undergraduate and graduate academic studies, it is necessary for the candidate to meet the criterion of having published at least 1 paper in a student magazine or presented at a student conference, which contains research results from the master's thesis.

**Knowledge evaluation (maximum 100 points)**

| Pre-examination obligations | Points | Final exam | Points |
|---|---|---|---|
| Lecture attendance | | Written part of the final exam | |
| Exercise attendance | | Oral part of the final exam | *100* |
| Coloquium exam/s | | .......... | |
| Term paper | | | |

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