

Study plan

Name of study plan: **Electrical Engineering, Power Engineering and Management - Economy and Management of Electrical Eng.**

Faculty/Institute/Others: Faculty of Electrical Engineering

Department: Department of Economics, Management and Humanities

Branch of study guaranteed by the department: Economy and Management of Electrical Engineering

Garantor of the study branch: prof. Ing. Gustav Tomek, DrSc.

Program of study: Electrical Engineering, Power Engineering and Management

Type of study: Follow-up master full-time

Required credits: 111

Elective courses credits: 9

Sum of credits in the plan: 120

Note on the plan:

Name of the block: Compulsory courses in the program

Minimal number of credits of the block: 72

The role of the block: P

Code of the group: 2015_MEEMEP2

Name of the group: Compulsory subjects of the programme

Requirement credits in the group: In this group you have to gain 47 credits

Requirement courses in the group: In this group you have to complete 9 courses

Credits in the group: 47

Note on the group:

| Code | Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i> | Completion | Credits | Scope | Semester | Role |
|-----------|--|------------|---------|-------|----------|------|
| BE1M16EKL | Ecology and Economy <i>Jaroslav Knápek Jaroslav Knápek Jaroslav Knápek (Gar.)</i> | Z,ZK | 5 | 3P+1S | Z | P |
| BE1M16FIU | Financial Accounting <i>Ji í Vaší ek, Josef ernohous Josef ernohous Ji í Vaší ek (Gar.)</i> | Z,ZK | 5 | 2P+2S | Z | P |
| BE1M16FIM | Financial Management | Z,ZK | 6 | 2P+2C | L | P |
| BE1M16IND | Individual project | Z | 5 | 0P+4S | Z | P |
| BE1M16MAR | Marketing | Z,ZK | 5 | 2P+2S | L | P |
| BE1M01MEK | Mathematics for Economy <i>Kate ina Helisová Kate ina Helisová Kate ina Helisová (Gar.)</i> | Z,ZK | 6 | 4P+2S | Z | P |
| BE1M16OVY | Operations Research <i>Jaroslav Knápek, Martin Dobiáš Martin Dobiáš Jaroslav Knápek (Gar.)</i> | Z,ZK | 5 | 2P+2C | Z,L | P |
| BE1M16STA | Statistical methods in economics <i>Sherzod Tashpulatov Sherzod Tashpulatov Sherzod Tashpulatov (Gar.)</i> | Z,ZK | 5 | 2P+2S | L | P |
| BE1M16SIR | System Analysis and Decision Making <i>Jaroslav Knápek</i> | Z,ZK | 5 | 2P+2C | Z | P |

Characteristics of the courses of this group of Study Plan: Code=2015_MEEMEP2 Name=Compulsory subjects of the programme

| | | | | |
|-----------|----------------------|------|---|---|
| BE1M16EKL | Ecology and Economy | Z,ZK | 5 | Development of environmental protection. Sustainable development. Global environmental problems and their aspects. Greenhouse effect and climate changes. Fossil fuels, nuclear fuel cycle and environmental impacts. Support schemes for renewable energy sources utilization. Economic effectiveness of renewable energy sources projects. Regulatory and economic instruments for economic activities regulation. Externalities. Environmental indicators. |
| BE1M16FIU | Financial Accounting | Z,ZK | 5 | Principles of accounting. Assets, inventory and financial investment book keeping. Debt and equity capital. Cost, revenues and profit. Tax system and accounting. Balance sheet, profit and loss account. Cash flow statement. Analysis of company's financial position. International accounting standards. Auditing, consolidated statements. Hello. |
| BE1M16FIM | Financial Management | Z,ZK | 6 | Principles of finance, present value and alternative cost of capital, net present value, valuation of bonds and stocks, investment decision and net present value, risk and alternative cost of capital, risk and return, lease or buy, taxes, inflation and return, financial and real options, option valuation and application, hedging, short term finance, cash flow management. |
| BE1M16IND | Individual project | Z | 5 | Independent work in the form of a project. A student will choose a topic from a list of topics specified by branch department. The project will be defended within the framework of a subject. |

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|---|-------------------------------------|------|---|
| BE1M16MAR | Marketing | Z,ZK | 5 |
| The role and functions of the marketing management. Marketing research and marketing information system. Concepts of marketing strategy. The use of product life cycle and portfolio. Marketing-mix. Product and service policy, pricing and contractation policy, communication, distribution. Controlling and audit. | | | |
| BE1M01MEK | Mathematics for Economy | Z,ZK | 6 |
| The aim is to recall the introduction to probability, familiarize students with basic terms properties and methods used in working with random processes, especially with Markov chains, and show applications of these mathematical tools in economics. | | | |
| BE1M16OVY | Operations Research | Z,ZK | 5 |
| Art of modeling and elements of decision models, Linear programming, Transportation problem, Integer linear programming, Introduction to graphs theory, Nonlinear programming, Dynamic programming, Monte Carlo simulation, Project management (CPM, PERT). | | | |
| BE1M16STA | Statistical methods in economics | Z,ZK | 5 |
| Basic Concepts. Statistical series. Assortment. Distributions of frequencies. One-dimensional descriptive characteristics. Measures of variables, coefficient of skewness, coefficient of excess. Points estimates of basic characteristics. Interval estimates of basic characteristics. Hypothesis testing of basic characteristics. Individual indexes number. Aggregative indexes. Variable-structure indexes. Multifactor indexes. Correlation and regression, Basic Concepts. Measurement of dependence intensity. Time series, concepts, qualities. Chronological average. Time series - trends and extrapolation. | | | |
| BE1M16SIR | System Analysis and Decision Making | Z,ZK | 5 |
| System approach and decision making, Decision models, Games theory, Decision making under uncertainty and risk, Decisions with multiple objectives, Stochastic programming, Expert systems, Cluster analysis | | | |

Code of the group: 2015_MEEMDIP

Name of the group: Diploma Thesis

Requirement credits in the group: In this group you have to gain 25 credits

Requirement courses in the group: In this group you have to complete 1 course

Credits in the group: 25

Note on the group:

| Code | Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.) | Completion | Credits | Scope | Semester | Role |
|--------|---|------------|---------|-------|----------|------|
| BDIP25 | Diploma Thesis | Z | 25 | 22s | L | P |

Characteristics of the courses of this group of Study Plan: Code=2015_MEEMDIP Name=Diploma Thesis

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|---|----------------|---|----|
| BDIP25 | Diploma Thesis | Z | 25 |
| Independent final comprehensive work for the Master's degree study programme. A student will choose a topic from a range of topics related to his or her branch of study, which will be specified by branch department or branch departments. The diploma thesis will be defended in front of the board of examiners for the comprehensive final examination. | | | |

Name of the block: Compulsory courses of the specialization

Minimal number of credits of the block: 35

The role of the block: PO

Code of the group: 2015_MEEMEPO5

Name of the group: Compulsory subjects of the branch

Requirement credits in the group: In this group you have to gain 35 credits

Requirement courses in the group: In this group you have to complete 7 courses

Credits in the group: 35

Note on the group:

| Code | Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.) | Completion | Credits | Scope | Semester | Role |
|-----------|---|------------|---------|-------|----------|------|
| BE1M16CTR | Controlling | Z,ZK | 6 | 2P+2S | Z | PO |
| BE1M13VES | Manufacturing of Electrical Components | KZ | 4 | 2P+2L | Z | PO |
| BE1M13VEZ | Manufacturing of Electronic Equipment | Z,ZK | 5 | 2P+2L | Z | PO |
| BE1M16MAV | Production Management | Z,ZK | 5 | 2P+2S | L | PO |
| BE1M16PMG | Project Management | KZ | 5 | 2P+2S | L | PO |
| BE1M16JAK | Quality management | Z,ZK | 5 | 2P+2S | Z | PO |

Characteristics of the courses of this group of Study Plan: Code=2015_MEEMEPO5 Name=Compulsory subjects of the branch

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|--|-------------|------|---|
| BE1M16CTR | Controlling | Z,ZK | 6 |
| The aim of the course is to present Management Control as a modern approach to Management of Enterprise, based on the Process and Activity Based Management which supports innovative changes by the application of Project Management principles. The focus is on the integrative potential of Management Control in the Management of Enterprise and on the key role played by Project Management. Special attention is paid to technical-financial integration and its impact. The emphasis is on Project Management of innovation processes, which guarantee the company not merely to survive, but also to achieve high performance. The computerized models are used for presentation key principles, procedures and also key links between the controlled entities and used managerial tools. | | | |

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|--|--|------|---|
| BE1M13VES | Manufacturing of Electrical Components | KZ | 4 |
| Technology of electric components in general. Basic technology in use. Type of components: resistors, potentiometers, capacitors with foil dielectric. Ceramic and electrolytic capacitors. Electromechanical devices. Semiconductors, fabrication of vertical and horizontal structures. Packaging. | | | |
| BE1M13VEZ | Manufacturing of Electronic Equipment | Z,ZK | 5 |
| Mechanical and electrical design. The electric contact. Joining of conductors. Cooling of components and equipment. Printed circuit boards fabrication. Soldering in electronics. Electromagnetic compatibility of electronic equipment. Protection of components and equipment sensitive on electrostatic field. Certification, accreditation, quality control and quality assurance. | | | |
| BE1M16MAV | Production Management | Z,ZK | 5 |
| The role of production process in promoting the marketing concept of the firm and the competitive advantage. The system of operational planning with respect to production typology. Standardized basis of production management, standardization. Controlling, production management methods. | | | |
| BE1M16PMG | Project Management | KZ | 5 |
| Processes and techniques for the preparation of entrepreneurial projects. Principles and methods of planning and operating of projects realization. Operating of the integration and project area. Operating of time, costs, sources, duality, human sources, communication, risks. Case study in the program Microsoft Project. | | | |
| BE1M16JAK | Quality management | Z,ZK | 5 |
| History of quality management (QM), Current approaches to quality management, quality management system (QMS) based on ISO 9001, Process management, Quality planning, Metrology in QM, Control of documents and records, Internal audits of QMS, Continual improvement of QMS, Integrated management, Statistic methods in QM, Accreditation and certification | | | |

Name of the block: Elective courses

Minimal number of credits of the block: 4

The role of the block: V

Code of the group: 2015_MEEMEVOL

Name of the group: Elective subjects

Requirement credits in the group:

Requirement courses in the group:

Credits in the group: 0

Note on the group: ~Student can choose arbitrary subject of themagister's program (EEM - Electrical Engineering, Power Engineering and Management, EK - Electronics and Communications, KYR - Cybernetics and Robotics, OI - Open Informatics, OES - Open Electronics Systems) which is not part of his curriculum. Student can choose with consideration of recommendation of the branch guarantee. You can find a selection of optional courses organized by the departments on the web site <http://www.fel.cvut.cz/cz/education/volitelne-predmety.html>

Code of the group: 2015_MEEMEH

Name of the group: Humanities subjects

Requirement credits in the group: In this group you have to gain at least 4 credits (at most 42)

Requirement courses in the group: In this group you have to complete at least 1 course (at most 12)

Credits in the group: 4

Note on the group:

| Code | Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.) | Completion | Credits | Scope | Semester | Role |
|-----------|---|------------|---------|-------|----------|------|
| BE0M16HSD | History of economy and social studies | Z,ZK | 4 | 2P+2S | L | v |
| BE0M16HT2 | History of science and technology 2 | Z,ZK | 4 | 2P+2S | L | v |
| BE0M16FI2 | Philosophy II | Z,ZK | 4 | 2P+2S | L | v |
| BE0M16MPS | Psychology | Z,ZK | 4 | 2P+2S | L | v |
| BE0M16TE1 | Theology | Z,ZK | 4 | 2P+2S | L | v |
| A003TV | Physical Education | Z | 2 | 0+2 | L,Z | v |

Characteristics of the courses of this group of Study Plan: Code=2015_MEEMEH Name=Humanities subjects

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|---|---------------------------------------|------|---|
| BE0M16HSD | History of economy and social studies | Z,ZK | 4 |
| This subject deals with the history of the Czech society in the 19th - 21th centuries. It follows the forming of the Czech political representation, its aims and achieved results as well as the social and cultural development and coexistence of the various ethnical groups in the Czech countries. | | | |
| BE0M16HT2 | History of science and technology 2 | Z,ZK | 4 |
| This subject traces historical developments in electrical engineering branches in the world and in the Czech Lands. Its ultimate goal is to stimulate students' interest in the history and traditions of the subject, while highlighting the developments in technical education and professional organizations, the process of shaping scientific life and the influence of technical engineers | | | |
| BE0M16FI2 | Philosophy II | Z,ZK | 4 |
| The course is oriented on the transdisciplinary aspects of philosophy, informatics, physics, mathematics and biology. | | | |
| BE0M16MPS | Psychology | Z,ZK | 4 |

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|---|--------------------|------|---|
| BE0M16TE1 | Theology | Z,ZK | 4 |
| This subject provides to students the basic orientation in christian theology and requires no special previous education. After short philosophic lecture the basic theologic disciplines are gone through. The subject is determined not only to believer students who want to know the reliable theologic grounding but also above all to ones who want to get know Christianity - religion from which grows our civilization up. | | | |
| A003TV | Physical Education | Z | 2 |

List of courses of this pass:

| Code | Name of the course | Completion | Credits |
|--|--|------------|---------|
| A003TV | Physical Education | Z | 2 |
| BDIP25 | Diploma Thesis | Z | 25 |
| Independent final comprehensive work for the Master's degree study programme. A student will choose a topic from a range of topics related to his or her branch of study, which will be specified by branch department or branch departments. The diploma thesis will be defended in front of the board of examiners for the comprehensive final examination. | | | |
| BE0M16FI2 | Philosophy II | Z,ZK | 4 |
| The course is oriented on the transdisciplinary aspects of philosophy, informatics, physics, mathematics and biology. | | | |
| BE0M16HSD | History of economy and social studies | Z,ZK | 4 |
| This subject deals with the history of the Czech society in the 19th - 21th centuries. It follows the forming of the Czech political representation, its aims and achieved results as well as the social and cultural development and coexistence of the various ethnical groups in the Czech countries. | | | |
| BE0M16HT2 | History of science and technology 2 | Z,ZK | 4 |
| This subject traces historical developments in electrical engineering branches in the world and in the Czech Lands. Its ultimate goal is to stimulate students' interest in the history and traditions of the subject, while highlighting the developments in technical education and professional organizations, the process of shaping scientific life and the influence of technical engineers | | | |
| BE0M16MPS | Psychology | Z,ZK | 4 |
| BE0M16TE1 | Theology | Z,ZK | 4 |
| This subject provides to students the basic orientation in christian theology and requires no special previous education. After short philosophic lecture the basic theologic disciplines are gone through. The subject is determined not only to believer students who want to know the reliable theologic grounding but also above all to ones who want to get know Christianity - religion from which grows our civilization up. | | | |
| BE1M01MEK | Mathematics for Economy | Z,ZK | 6 |
| The aim is to recall the introduction to probability, familiarize students with basic terms properties and methods used in working with random processes, especially with Markov chains, and show applications of these mathematical tools in economics. | | | |
| BE1M13VES | Manufacturing of Electrical Components | KZ | 4 |
| Technology of electric components in general. Basic technology in use. Type of components: resistors, potentiometers, capacitors with foil dielectric. Ceramic and electrolytic capacitors. Electromechanical devices . Semiconductors, fabrication of vertical and horizontal structures. Packaging. | | | |
| BE1M13VEZ | Manufacturing of Electronic Equipment | Z,ZK | 5 |
| Mechanical and electrical design. The electric contact. Joining of conductors. Cooling of components and equipment. Printed circuit boards fabrication. Soldering in electronics. Electromagnetic compatibility of electronic equipment. Protection of components and equipment sensitive on electrostatic field. Certification, accreditation, quality control and quality assurance. | | | |
| BE1M16CTR | Controlling | Z,ZK | 6 |
| The aim of the course is to present Management Control as a modern approach to Management of Enterprise, based on the Process and Activity Based Management which supports innovative changes by the application of Project Management principles. The focus is on the integrative potential of Management Control in the Management of Enterprise and on the key role played by Project Management. Special attention is paid to technical-financial integration and its impact. The emphasis is on Project Management of innovation processes, which guarantee the company not merely to survive, but also to achieve high performance. The computerized models are used for presentation key principles, procedures and also key links between the controlled entities and used managerial tools. | | | |
| BE1M16EKL | Ecology and Economy | Z,ZK | 5 |
| Development of environmental protection. Sustainable development. Global environmental problems and their aspects. Greenhouse effect and climate changes. Fossil fuels, nuclear fuel cycle and environmental impacts. Support schemes for renewable energy sources utilization. Economic effectiveness of renewable energy sources projects. Regulatory and economic instruments for economic activities regulation. Externalities. Environmental indicators. | | | |
| BE1M16FIM | Financial Management | Z,ZK | 6 |
| Principles of finance, present value and alternative cost of capital, net present value, valuation of bonds and stocks, investment decision and net present value, risk and alternative cost of capital, risk and return, lease or buy, taxes, inflation and return, financial and real options, option valuation and application, hedging, short term finance, cash flow management. | | | |
| BE1M16FIU | Financial Accounting | Z,ZK | 5 |
| Principles of accounting. Assets, inventory and financial investment book keeping. Debt and equity capital. Cost, revenues and profit. Tax system and accounting. Balance sheet, profit and loss account. Cash flow statement. Analysis of company's financial position. International accounting standards. Auditing, consolidated statements. Hello. | | | |
| BE1M16IND | Individual project | Z | 5 |
| Independent work in the form of a project. A student will choose a topic from a list of topics specified by branch department. The project will be defended within the framework of a subject. | | | |
| BE1M16JAK | Quality management | Z,ZK | 5 |
| History of quality management (QM), Current approaches to quality management, quality management system (QMS) based on ISO 9001, Process management, Quality planning, Metrology in QM, Control of documents and records, Internal audits of QMS, Continual improvement of QMS, Integrated management, Statistic methods in QM, Accreditation and certification | | | |
| BE1M16MAR | Marketing | Z,ZK | 5 |
| The role and functions of the marketing management. Marketing research and marketing information system. Concepts of marketing strategy. The use of product life cycle and portfolio. Marketing-mix. Product and service policy, pricing and contraction policy, communication, distribution. Controlling and audit. | | | |
| BE1M16MAV | Production Management | Z,ZK | 5 |
| The role of production process in promoting the marketing concept of the firm and the competitive advantage. The system of operational planning with respect to production typology. Standardized basis of production management, standardization. Controlling, production management methods. | | | |

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|-----------|--|------|---|
| BE1M16OVY | Operations Research Art of modeling and elements of decision models, Linear programming, Transportation problem, Integer linear programming, Introduction to graphs theory, Nonlinear programming, Dynamic programming, Monte Carlo simulation, Project management (CPM, PERT). | Z,ZK | 5 |
| BE1M16PMG | Project Management Processes and techniques for the preparation of entrepreneurial projects. Principles and methods of planning and operating of projects realization. Operating of the integration and project area. Operating of time, costs, sources, duality, human sources, communication, risks. Case study in the program Microsoft Project. | KZ | 5 |
| BE1M16SIR | System Analysis and Decision Making System approach and decision making, Decision models, Games theory, Decision making under uncertainty and risk, Decisions with multiple objectives, Stochastic programming, Expert systems, Cluster analysis | Z,ZK | 5 |
| BE1M16STA | Statistical methods in economics Basic Concepts. Statistical series. Assortment. Distributions of frequencies. One-dimensional descriptive characteristics. Measures of variables, coefficient of skewness, coefficient of excess. Points estimates of basic characteristics. Interval estimates of basic characteristics. Hypothesis testing of basic characteristics. Individual indexes number. Aggregative indexes. Variable-structure indexes. Multifactor indexes . Correlation and regression, Basic Concepts. Measurement of dependence intensity. Time series, concepts, qualities. Chronological average . Time series - trends and extrapolation. | Z,ZK | 5 |

For updated information see <http://bilakniha.cvut.cz/en/f3.html>

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