MATRIX

of existing Master course

(Technical University of Moldova Faculty of Urbanism and Architecture)

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| Name of compulsory chair | Year | Semester | Number of ECTS | Number of elective chairs | List of available elective chairs | short description | relation between the contents and RETHINK’s theme |
| Management of sanitary engineering facilities and environmental protection |
| Psyhopedagogy | 1st year | 1 semester | 5 | not available | not available | 1. Psychopedagogy in Higher Education (Technical): regularities, axioms, principles, the subject of psycho-pedagogy; university education in the context of new needs’ system; competences; SWOT analysis of the technical university education system.
2. Didactical in terms of Higher Education: the education process; components and characteristics; dynamic of educational process; concept of educational content; effective learning conditions; teaching communication.
3. Learning cognitive, energizing and regulatory mechanisms: the role of affectivity in learning; role of motivation in learning; attention; will; communication and language.
4. The concept of educability in the context of Higher Education: theories of educability; factors of development and training of human personality; intelligence development as objective of university education.
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| Statistical and metrological analysis of measurements | 5 | Mathematical modeling, general issues, examples. Numerical computation: classic and contemporary look. Probabilistic models. Definitions of probability: classical, statistical, geometric expertise, axiomatic with applications in quality control of products, the Monte-Carlo method. Basic concepts and theorems of probability theory. The independence of the events, Bernstein's example. Bayer's formula, applied. Bernoulli scheme. Random variables, discrete, continuous. Typical numerical average, standard deviation as quality assessment equipment. Distribution functions, density, studying the most important types of distributions. Limit theorems. Basics of mathematical statistics, the overall selection (population), and selection (sample). Empirical numerical characteristics. Empirical distribution functions. The problem of statistical estimates. The conditions for the estimate to be "good quality". Point estimates of the mean, variance in different conditions. Estimation of confidence intervals, hypothesis verification. Planning on graphs. Critical Path Method. Applying mathematical logic device in electronic computing systems design. |
| Management and quality assurance | 5 | Quality - determinant of enterprise competitiveness. The essence of quality management. The concept of Total Quality Management (TQM). Quality management according to ISO 9000:2000 standards. Quality Management System documentation. Structure of the Quality Management System. Implementation of Quality Management System in the enterprise. ISO 22000 is the security of the products. Environmental Management Systems ISO 14000. |
| Investments efficiency in construction | 5 | The economic essence of investment. The concept of investment. The investment policy of the state. The investment strategy of Republic of Moldova. Time value of money. The effect of inflation on the value of money. Rationale the discount rate. Methods of determination of investment expenditures. Sources of financing of investment projects. Determination of net cash flow. The principles of economic efficiency assessment. Methods of evaluating the economic efficiency of the project. Substantiation of economic efficiency of investments. |
| Bases of applied research | 5 | Advantages of active experiment. The general scheme for solving technological problems on the base of methods probabilistic statistics. Type of matrices. Operations on matrices. Basics of the theory of experiment planning. The sequence of solving problems. Planning and deduction Matrix matrix equation for determining the coefficients of the mathematical model. Probabilistic characteristics and attributes of linear models. The calculation of the Fisher information matrix and covariance matrix dispersion. Dispersion projected value of the output parameter. Plans for 3.4 and more factors. Randomization. Planning fractionally. Saturation and excess plans. Mixing effects. Quarter lines. Mixing effects. Example. Determination extreme areas. Example of rapid ascent to the surface response. Far zone description. Second degree orthogonal planes, orthogonal central compositional rotation. Analysis mathematical model. Interpretation of results obtained using mathematical models planned experiment. Criteria for assessing the quality of the plans used in the mathematical theory of experiment. |
| Modern materials in construction | 5 | 1. Information about the industrial base on manufacture of building materials in the Republic of Moldova. The importance of knowledge production technologies of construction science and practice her essence and tasks. The tendency of development of the industry of building materials with characteristic performance.2. Raw materials for the production of building materials and modern methods of determining their main properties. 3. The basic processes of physico-chemical technologies for the production of building materials.4. Building materials with characteristics effective and modern methods of determination of their basic properties |
| Total 1 sem. |  |  | 30 |  |  |  |  |
| Integrated environmental protection | 1st year | 2 semester | 5 | not available | not available | Study of the fundamental principles of environmental management. The use of new methods in solving practical ways of improving the management of complex environmental and changing environmental awareness of the population in this area. |  |
| Impact of environmental health engineering systems | 5 | Unfavorable environmental factors formed from industry, agriculture, construction, etc., that make it necessary to conduct a series of preventive measures for environmental rehabilitation and prevention of morbidity. This imposes the need for training on state sanitary inspection on the implementation of measures to sanitize the environment, subject to the influence of unfavorable disease prevention ingredients pollutants of air, water and soil. |
| Fundamentals of advanced technology engineering networks  | 5 | Offices and organizations design and constructions. Management design of hydro system/urban public works; human resources management; work organization design manager. The choice of methods of regional projects on the basis of advanced technologies of construction of hydro systems installations. Determine the volume of work, the human resources, equipment and machines. The design of the General plan of construction organization and scheduling of works. Calculation and analysis of technical-economic indicators |
| Clean technologies and sustainable management of ecosystems | 5 | Concepts and definitions in the clean technologies productions on based to reduce the impact on artificial ecosystems. Ecologically cleaner technologies to reduce the risk of environmental pollution and human health. The use of wide application of organic fertilizers management in artificial ecosystems. Basic characteristics of cleaner production (Preventive, Continue, totally, efficient, ecological status and reduce costs). |
| Technological processes and equipment for municipal and industrial wastewater | 5 | General and fundamental knowledge about the processes of wastewater treatment and sludge treatment plant. Advanced technologies, facilities and modern equipment for wastewater treatment and sludge treatment: physic-mechanical treatment, biological, disinfection of wastewater, stabilization, dehydration, sterilization and utilization of sludge resulting from wastewater treatment.Advanced treatment of wastewater treated conventionally: advanced removal of suspended solids and BOD, nitrification-denitrification of nitrogen ammonia. Technologies and equipment for removal of nutrients (nitrogen and phosphorus) from the wastewater. Particularities of stations and wastewater treatment technologies, small and industrial wastewater with high organic matter, biodegradable. Anaerobic-aerobic treatment of wastewater using fixed microflora. |
| Water treatment processes and installation  | 5 | General information about the use of advanced technologies (diagrams, installations and equipment) in the process of purification of natural water for domestic and industrial. Treatment processes: sedimentation, centrifugation, filtration, flotation, ultrafiltration, nanofiltration, reverse osmosis. Installations preparation of reagents for the intensification of the treatment.Processes and equipment for removal of iron, mangan, fluorine, hydrogen sulphide. Processes and equipment for disinfection of treated water: chlorination, sterilization (UV installations, installations Oxidex). |
| Total 2 sem. |  |  | 30 |  |  |  |  |
| Master thesis | 2nd year | 3 semester | 30 | not available | not available | The main objectives of the development process master thesis are: • formulation and correct evaluation of the issues proposed in the dissertation for the research; • select and analyze sources of technical information, economic, patents, about the problems are analyzed in this thesis; • reasoning methodology applied or developed to solve the problem formulated above; • argument developed solutions and decisions; • correct use of research tools – computers, laboratory equipment – as tools for optimization, design, analysis, synthesis and evaluation; • systematization, consolidation and expansion of knowledge, theoretical and practical knowledge of the specialty and their use at the decision of tasks of scientific, technical, economic and production; • development of skills to work independently and knowledge of research methods and experiment at the decision of tasks and issues developed in the thesis of the master |  |
| Total 3 sem. |  |  | 30 |  |  |  |  |
| Total for Master course: | 1,5 years | 3 semesters | 90 |  |  |  |  |