Winter semester

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| FACULTY: | Civil Engineering, Environmental and Geodetic Sciences |
| FIELD OF STUDY: | Civil Engineering |
| ERASMUS COORDINATOR OF THE FACULTY: | Tomasz Dąbrowski PhD |
| E-MAIL ADDRESS OF THE COORDINATOR: | tomasz.dabrowski@tu.koszalin.pl |
| COURSE TITLE: | Building materials |
| LECTURER'S NAME: | dr inż Janusz Kobaka |
| E-MAIL ADDRESS OF THE LECTURER: | janusz.kobaka@tu.koszalin.pl |
| ECTS POINTS FOR THE COURSE: | 2 |
| ACADEMIC YEAR: | 2020/2021 |
| SEMESTER:<br>(W – winter, S – summer) | W |
| HOURS IN SEMESTER: | 15 |
| LEVEL OF THE COURSE:<br>(1st cycle, 2nd cycle, 3rd cycle) | 1st cycle |
| TEACHING METHOD:<br>(lecture, laboratory, group tutorials, seminar, other-what type?) | Seminar, laboratory |
| LANGUAGE OF INSTRUCTION: | English |
| ASSESSMENT METHOD:<br>(written exam, oral exam, class test, written reports, project work, presentation, continuous assessment, other – what type?) | Written reports, class test |
| COURSE CONTENT: | Principal building materials – basic information, ceramic materials, binding materials (lime, gypsum, cement), mortars, ordinary concretes, special concretes, show of building materials, visit to the laboratory. |
| ADDITIONAL INFORMATION: | |

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| FACULTY: | Civil Engineering, Environmental and Geodetic Sciences |
| FIELD OF STUDY: | Civil Engineering |
| ERASMUS COORDINATOR OF THE FACULTY: | Tomasz Dąbrowski PhD |
| E-MAIL ADDRESS OF THE COORDINATOR: | tomasz.dabrowski@tu.koszalin.pl |
| COURSE TITLE: | Town planning and architecture |
| LECTURER'S NAME: | mgr inż. arch. Maciej Siekierski |
| E-MAIL ADDRESS OF THE LECTURER: | architekt@wilsig.tu.koszalin.pl |
| ECTS POINTS FOR THE COURSE: | 2 |
| ACADEMIC YEAR: | 2020/2021 |
| SEMESTER:<br>(W – winter, S – summer) | W or S |
| HOURS IN SEMESTER: | 15 |
| LEVEL OF THE COURSE:<br>(1st cycle, 2nd cycle, 3rd cycle) | 1st cycle |
| TEACHING METHOD:<br>(lecture, laboratory, group tutorials, seminar, other-what type?) | lecture/ group tutorials |
| LANGUAGE OF INSTRUCTION: | English |
| ASSESSMENT METHOD:<br>(written exam, oral exam, class test, written reports, project work, presentation, continuous assessment, other – what type?) | project work |
| COURSE CONTENT: | Architecture and urban planning - comparison of concepts. Principles of city design. Types of cities. The history of construction solutions in architecture. |
| ADDITIONAL INFORMATION: | The course is based on examples from Europe, Asia, Central America and South America. |

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| FACULTY: | Civil Engineering, Environmental and Geodetic Sciences |
| FIELD OF STUDY: | Civil Engineering |
| ERASMUS COORDINATOR OF THE FACULTY: | Tomasz Dąbrowski PhD |
| E-MAIL ADDRESS OF THE COORDINATOR: | tomasz.dabrowski@tu.koszalin.pl |
| COURSE TITLE: | Surveying 1 |
| LECTURER'S NAME: | Krzysztof Deska PhD |
| E-MAIL ADDRESS OF THE LECTURER: | krzysztof.deska@tu.koszalin.pl |
| ECTS POINTS FOR THE COURSE: | 5 |
| ACADEMIC YEAR: | 2020/2021 |
| SEMESTER:<br>(W – winter, S – summer) | W or S |
| HOURS IN SEMESTER: | 45 (15+30) |
| LEVEL OF THE COURSE:<br>(1st cycle, 2nd cycle, 3rd cycle) | 1st cycle |
| TEACHING METHOD:<br>(lecture, laboratory, group tutorials, seminar, other-what type?) | lecture 15 h + laboratory, group tutorials, individual consultations 30 h |
| LANGUAGE OF INSTRUCTION: | English |
| ASSESSMENT METOD:<br>(written exam, oral exam, class test, written reports, project work, presentation, continuous assessment, other – what type?) | class test, written reports, project work |
| COURSE CONTENT: | Basic principles in surveying. Geodetic reference system and reference points. Geodetic instruments: levels, precision levels, theodolites, EDM, manual and robotic total stations, GNSS receivers, optical and laser plummets. Construction, principles of operation, software, settings and usage of instruments. Techniques of measurement (distance, angles, precise GNSS positioning). Field measurements. |
| ADDITIONAL INFORMATION: | |

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|---|---|
| FACULTY: | Civil Engineering, Environmental and Geodetic Sciences |
| FIELD OF STUDY: | Civil Engineering |
| ERASMUS COORDINATOR OF THE FACULTY: | Tomasz Dąbrowski PhD |
| E-MAIL ADDRESS OF THE COORDINATOR: | tomasz.dabrowski@tu.koszalin.pl |
| COURSE TITLE: | Surveying 2 |
| LECTURER'S NAME: | Krzysztof Deska PhD |
| E-MAIL ADDRESS OF THE LECTURER: | krzysztof.deska@tu.koszalin.pl |
| ECTS POINTS FOR THE COURSE: | 5 |
| ACADEMIC YEAR: | 2020/2021 |
| SEMESTER:<br>(W – winter, S – summer) | W or S |
| HOURS IN SEMESTER: | 45 (15+30) |
| LEVEL OF THE COURSE:<br>(1st cycle, 2nd cycle, 3rd cycle) | 1st cycle |
| TEACHING METHOD:<br>(lecture, laboratory, group tutorials, seminar, other-what type?) | lecture 15 h + laboratory, group tutorials, individual consultations 30 h |
| LANGUAGE OF INSTRUCTION: | English |
| ASSESSMENT METOD:<br>(written exam, oral exam, class test, written reports, project work, presentation, continuous assessment, other – what type?) | class test, written reports, project work |
| COURSE CONTENT: | Design and field data processing, calculations. Basic map-making. Engineering surveying incl. i.a.: setting out engineering objects, methods of measuring deformation, research of horizontal and vertical displacement of structures and their surroundings. |
| ADDITIONAL INFORMATION: | |

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| FACULTY: | Civil Engineering, Environmental and Geodetic Sciences |
| FIELD OF STUDY: | Civil Engineering |
| ERASMUS COORDINATOR OF THE FACULTY: | Tomasz Dąbrowski PhD |
| E-MAIL ADDRESS OF THE COORDINATOR: | tomasz.dabrowski@tu.koszalin.pl |
| COURSE TITLE: | Soil Mechanics |
| LECTURER'S NAME: | Magdalena Pietrzak, Iwona Radosz, Jarosław Filipiak |
| E-MAIL ADDRESS OF THE LECTURER: | kgeo@tu.koszalin.pl, magdalena.pietrzak@tu.koszalin.pl, iwona.radosz@tu.koszalin.pl, prikret@poczta.onet.pl |
| ECTS POINTS FOR THE COURSE: | 2 |
| ACADEMIC YEAR: | 2020/2021 |
| SEMESTER:<br>(W – winter, S – summer) | W or S |
| HOURS IN SEMESTER: | 30 |
| LEVEL OF THE COURSE:<br>(1st cycle, 2nd cycle, 3rd cycle) | 1st cycle |
| TEACHING METHOD:<br>(lecture, laboratory, group tutorials, seminar, other-what type?) | laboratory, group tutorials |
| LANGUAGE OF INSTRUCTION: | English/Polish |
| ASSESSMENT METHOD:<br>(written exam, oral exam, class test, written reports, project work, presentation, continuous assessment, other – what type?) | oral exam, class test, written reports, project work, presentation, continuous assessment, |
| COURSE CONTENT: | Three phases of soil model and parameters of its description. Physical and chemical properties of soils. Soil Composition, Soil consistency: compaction and Atterberg limits. Heaving soils. Groundwater types. Water flow in soils. Coefficient of Permeability, Concept of effective stresses. Stress and strain paths. The simplest soil constitutive models (elastic and elastic-perfectly plastic with Coulomb – Mohr failure surface) and their parameters. Compressibility and consolidation. Distribution of stresses in the subsoil. Strength behavior of soils Rankine's theory. Behavior of Clayey Soils Stress in soils due to external load.<br>Laboratory: Atterberg limits and Proctor compaction test. Geotechnical documentation: geotechnical-engineering cross-sections of substratum |
| ADDITIONAL INFORMATION: | |

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|---|---|
| FACULTY: | Civil Engineering, Environmental and Geodetic Sciences |
| FIELD OF STUDY: | Civil Engineering |
| ERASMUS COORDINATOR OF THE FACULTY: | Tomasz Dąbrowski PhD |
| E-MAIL ADDRESS OF THE COORDINATOR: | tomasz.dabrowski@tu.koszalin.pl |
| COURSE TITLE: | Terrestrial laser scanning |
| LECTURER'S NAME: | dr inż. Czesław Suchocki |
| E-MAIL ADDRESS OF THE LECTURER: | czeslaw.suchocki@tu.koszalin.pl |
| ECTS POINTS FOR THE COURSE: | 3 |
| ACADEMIC YEAR: | 2020/2021 |
| SEMESTER:<br>(W – winter, S – summer) | W or S |
| HOURS IN SEMESTER: | 30 |
| LEVEL OF THE COURSE:<br>(1st cycle, 2nd cycle, 3rd cycle) | 1st cycle |
| TEACHING METHOD:<br>(lecture, laboratory, group tutorials, seminar, other-what type?) | group tutorials, individual consultations |
| LANGUAGE OF INSTRUCTION: | English |
| ASSESSMENT METHOD:<br>(written exam, oral exam, class test, written reports, project work, presentation, continuous assessment, other – what type?) | project work / presentation |
| COURSE CONTENT: | The theoretical background of TLS, laser equation, principles of scanner measurement, practical TLS measurements, diagnostic measurements of buildings, post-processing of point clouds: registration of point clouds, radiometric dataset analysis, modeling, defect detection of building wall. |
| ADDITIONAL INFORMATION: | |

……Suchocki Czesław, 03.03.2020……..
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| FACULTY: | Civil Engineering, Environmental and Geodetic Sciences |
| FIELD OF STUDY: | Civil Engineering |
| ERASMUS COORDINATOR OF THE FACULTY: | Tomasz Dąbrowski PhD |
| E-MAIL ADDRESS OF THE COORDINATOR: | tomasz.dabrowski@tu.koszalin.pl |
| COURSE TITLE: | GIS |
| LECTURER'S NAME: | dr inż. Tomasz Oberski |
| E-MAIL ADDRESS OF THE LECTURER: | tomasz.oberski@tu.koszalin.pl |
| ECTS POINTS FOR THE COURSE: | 5 |
| ACADEMIC YEAR: | 2019/2020 |
| SEMESTER:<br>(W – winter, S – summer) | W |
| HOURS IN SEMESTER: | 45(15+30) |
| LEVEL OF THE COURSE:<br>(1st cycle, 2nd cycle, 3rd cycle) | 1st cycle |
| TEACHING METHOD:<br>(lecture, laboratory, group tutorials, seminar, other-what type?) | lecture, laboratory |
| LANGUAGE OF INSTRUCTION: | English |
| ASSESSMENT METOD:<br>(written exam, oral exam, class test, written reports, project work, presentation, continuous assessment, other – what type?) | class test, project |
| COURSE CONTENT: | Fundamentals of use GIS software mainly focused on open source approach. Spatial data analysis with DTM and vector data. Building personal geodatabases for storing spatial data. Designing and carry out own GIS project with its cartographic presentation. |

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| FACULTY: | Civil Engineering, Environmental and Geodetic Sciences |
| FIELD OF STUDY: | Civil Engineering |
| ERASMUS COORDINATOR OF THE FACULTY: | Tomasz Dąbrowski PhD |
| E-MAIL ADDRESS OF THE COORDINATOR: | tomasz.dabrowski@tu.koszalin.pl |
| COURSE TITLE: | Precise GNSS positioning |
| LECTURER'S NAME: | Krzysztof Deska PhD |
| E-MAIL ADDRESS OF THE LECTURER: | krzysztof.deska@tu.koszalin.pl |
| ECTS POINTS FOR THE COURSE: | 5 |
| ACADEMIC YEAR: | 2020/2021 |
| SEMESTER:<br>(W – winter, S – summer) | W or S |
| HOURS IN SEMESTER: | 45 (15+30) |
| LEVEL OF THE COURSE:<br>(1st cycle, 2nd cycle, 3rd cycle) | 1st cycle |
| TEACHING METHOD:<br>(lecture, laboratory, group tutorials, seminar, other-what type?) | lecture 15 h + laboratory, group tutorials, individual consultations 30 h |
| LANGUAGE OF INSTRUCTION: | English |
| ASSESSMENT METOD:<br>(written exam, oral exam, class test, written reports, project work, presentation, continuous assessment, other – what type?) | class test, written reports, project work |
| COURSE CONTENT: | Reference coordinate systems. Global Navigation Satellite Systems. GNSS observations and standards. Settings and usage of instruments. Field measurements: static, RTK, RTN. Techniques of measurement of hidden-points. GNSS data post-processing software and usage. |
| ADDITIONAL INFORMATION: | |

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|---|---|
| FACULTY: | Civil Engineering, Environmental and Geodetic Sciences |
| FIELD OF STUDY: | Civil Engineering |
| ERASMUS COORDINATOR OF THE FACULTY: | Tomasz Dąbrowski PhD |
| E-MAIL ADDRESS OF THE COORDINATOR: | tomasz.dabrowski@tu.koszalin.pl |
| COURSE TITLE: | Electronic techniques of measurement |
| LECTURER'S NAME: | Krzysztof Deska PhD |
| E-MAIL ADDRESS OF THE LECTURER: | krzysztof.deska@tu.koszalin.pl |
| ECTS POINTS FOR THE COURSE: | 5 |
| ACADEMIC YEAR: | 2020/2021 |
| SEMESTER:<br>(W – winter, S – summer) | W or S |
| HOURS IN SEMESTER: | 45 (15+30) |
| LEVEL OF THE COURSE:<br>(1st cycle, 2nd cycle, 3rd cycle) | 1st cycle |
| TEACHING METHOD:<br>(lecture, laboratory, group tutorials, seminar, other-what type?) | lecture 15 h + laboratory, group tutorials, individual consultations 30 h |
| LANGUAGE OF INSTRUCTION: | English |
| ASSESSMENT METOD:<br>(written exam, oral exam, class test, written reports, project work, presentation, continuous assessment, other – what type?) | class test, written reports, project work |
| COURSE CONTENT: | Geodetic instruments: levels, precision levels, theodolites, EDM, manual and robotic total stations, optical and laser plummets. Construction, principles of operation, software, settings and usage of instruments. Laboratory procedures using collimators for testing, calibrating and adjusting geodetic instruments. Field procedures for testing. Techniques of measurement using geodetic instruments. |
| ADDITIONAL INFORMATION: | Field procedures for testing geodetic instruments in accordance with ISO 17123 standards. |

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| FACULTY: | Civil Engineering, Environmental and Geodetic Sciences |
| FIELD OF STUDY: | Civil Engineering |
| ERASMUS COORDINATOR OF THE FACULTY: | Tomasz Dąbrowski PhD |
| E-MAIL ADDRESS OF THE COORDINATOR: | tomasz.dabrowski@tu.koszalin.pl |
| COURSE TITLE: | Atmosphere protection |
| LECTURER'S NAME: | Tomasz Dąbrowski |
| E-MAIL ADDRESS OF THE LECTURER: | tomasz.dabrowski@tu.koszalin.pl |
| ECTS POINTS FOR THE COURSE: | 1 |
| ACADEMIC YEAR: | 2020/2021 |
| SEMESTER:<br>(W – winter, S – summer) | W |
| HOURS IN SEMESTER: | 15 |
| LEVEL OF THE COURSE:<br>(1st cycle, 2nd cycle, 3rd cycle) | 1st cycle |
| TEACHING METHOD:<br>(lecture, laboratory, group tutorials, seminar, other-what type?) | Lecture, seminar |
| LANGUAGE OF INSTRUCTION: | English |
| ASSESSMENT METOD:<br>(written exam, oral exam, class test, written reports, project work, presentation, continuous assessment, other – what type?) | Class test, project work |
| COURSE CONTENT: | The course presents in formation on Earth's atmosphere, processes which take place in it. The crucial part of the course discusses the most important air pollutants, their impact on the environment, and human health. The course also presents necessary information on methods of flue gas treatment. |
| ADDITIONAL INFORMATION: | |

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| FACULTY: | Civil Engineering, Environmental and Geodetic Sciences |
| FIELD OF STUDY: | Civil Engineering |
| ERASMUS COORDINATOR OF THE FACULTY: | Tomasz Dąbrowski PhD |
| E-MAIL ADDRESS OF THE COORDINATOR: | tomasz.dabrowski@tu.koszalin.pl |
| COURSE TITLE: | Basics of CAD |
| LECTURER'S NAME: | Tomasz Dąbrowski |
| E-MAIL ADDRESS OF THE LECTURER: | tomasz.dabrowski@tu.koszalin.pl |
| ECTS POINTS FOR THE COURSE: | 2 |
| ACADEMIC YEAR: | 2020/2021 |
| SEMESTER:<br>(W – winter, S – summer) | W |
| HOURS IN SEMESTER: | 30 |
| LEVEL OF THE COURSE:<br>(1st cycle, 2nd cycle, 3rd cycle) | 1st |
| TEACHING METHOD:<br>(lecture, laboratory, group tutorials, seminar, other-what type?) | Group tutorials in computer laboratory |
| LANGUAGE OF INSTRUCTION: | English |
| ASSESSMENT METHOD:<br>(written exam, oral exam, class test, written reports, project work, presentation, continuous assessment, other – what type?) | Project work |
| COURSE CONTENT: | The course is an introduction to CAD. It shows Elements of interface and communication with the program. Essential functions creating objects, hatching, and precise drawing are discussed. Then functions for modifying created objects are presented. Layers and operations on them, properties of objects and methods of their adjusting, processes using blocks, and dimensioning of objects are discussed. |
| ADDITIONAL INFORMATION: | |

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| FACULTY: | Civil Engineering, Environmental and Geodetic Sciences |
| FIELD OF STUDY: | Civil Engineering |
| ERASMUS COORDINATOR OF THE FACULTY: | Tomasz Dąbrowski PhD |
| E-MAIL ADDRESS OF THE COORDINATOR: | tomasz.dabrowski@tu.koszalin.pl |
| COURSE TITLE: | Technology and properties of fibre reinforced concrete |
| LECTURER'S NAME: | dr hab. inż. Jacek Domski & dr inż. Janusz Kobaka |
| E-MAIL ADDRESS OF THE LECTURER: | jacek.domski@tu.koszalin.pl; janusz.kobaka@tu.koszalin.pl |
| ECTS POINTS FOR THE COURSE: | 3 |
| ACADEMIC YEAR: | 2020/2021 |
| SEMESTER: (W – winter, S – summer) | W |
| HOURS IN SEMESTER: | 30 |
| LEVEL OF THE COURSE: (1st cycle, 2nd cycle, 3rd cycle) | 2nd cycle |
| TEACHING METHOD: (lecture, laboratory, group tutorials, seminar, other-what type?) | group tutorials & laboratory |
| LANGUAGE OF INSTRUCTION: | English |
| ASSESSMENT METHOD: (written exam, oral exam, class test, written reports, project work, presentation, continuous assessment, other – what type?) | project work & presentation |
| COURSE CONTENT: | Origins and history of fibre reinforced concrete. Materials used for engineered fibre production. Types and properties of steel fibre used as a concrete reinforcement. Dosage of fibre and technology of concrete matrix production. Specific mechanical properties of fibre reinforced concrete. Methods of destructive testing of fibre reinforced concrete. Applications and durability of fibre reinforced concrete. Dynamic mechanical properties of fibre reinforced concrete. Methods of non-destructive testing of fibre reinforced concrete. SCC fibre reinforced concretes. |
| ADDITIONAL INFORMATION: | Course based on trice approaches of European, American and Japanese standards. |

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Summer semester

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| FACULTY: | Civil Engineering, Environmental and Geodetic Sciences |
| FIELD OF STUDY: | Civil Engineering |
| ERASMUS COORDINATOR OF THE FACULTY: | Tomasz Dąbrowski PhD |
| E-MAIL ADDRESS OF THE COORDINATOR: | tomasz.dabrowski@tu.koszalin.pl |
| COURSE TITLE: | Mathematics I |
| LECTURER'S NAME: | Dr hab. Volodymyr Sushch, Prof. PK |
| E-MAIL ADDRESS OF THE LECTURER: | volodymyr.sushch@tu.koszalin.pl |
| ECTS POINTS FOR THE COURSE: | 6 |
| ACADEMIC YEAR: | 2020/2021 |
| SEMESTER:<br>(W – winter, S – summer) | S |
| HOURS IN SEMESTER: | 30 + 30 |
| LEVEL OF THE COURSE:<br>(1st cycle, 2nd cycle, 3rd cycle) | 1st cycle |
| TEACHING METHOD:<br>(lecture, laboratory, group tutorials, seminar, other-what type?) | Lecture + practice |
| LANGUAGE OF INSTRUCTION: | English |
| ASSESSMENT METHOD:<br>(written exam, oral exam, class test, written reports, project work, presentation, continuous assessment, other – what type?) | Written exam |
| COURSE CONTENT: | **Linear algebra**<br>**Complex numbers:** the unit imaginary number, the Cartesian form or algebraic form of complex numbers, complex plane, absolute value, conjugation and distance, geometric interpretation of complex numbers, the operations on complex numbers, the polar form of complex numbers (the trigonometric form), Euler formula, Moivre's formula, Powers and roots of complex numbers, solutions of polynomial equations.<br>**Matrices:** definition and notation, matrix operations, matrix multiplication, square matrices, determinant of a matrix, properties of determinants, matrix inverses, rank of a matrix .<br>**System of linear equations:** matrix equation, solution set, solving linear systems (eliminations of variable - Gauss-Jordan elimination, Cramer's rule and other methods).<br>**Vectors in Euclidean space:** vector operations, linear combination, linear independence, scalar product, vector product.<br><br>**Differential calculus**<br>**Differentiation and the derivative of real-valued functions of a single real variable:** definition via difference quotients, the derivative as a function, continuity and differentiability, higher derivatives.<br>**Computing the derivative:** derivatives of elementary functions, product rule, quotient rule, chain rule. |

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| | **Applications of the derivative:** L'Hospital's rule, critical points, monotone increase and decrease, minimization and maximization, local minima and maxima (the first derivative test), using the second derivative, the concavity of the graph of a function. |
| ADDITIONAL INFORMATION: | |

Volodymyr Sushch, 04.02.2020
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|---|---|
| FACULTY: | Civil Engineering, Environmental and Geodetic Sciences |
| FIELD OF STUDY: | Civil Engineering |
| ERASMUS COORDINATOR OF THE FACULTY: | Tomasz Dąbrowski PhD |
| E-MAIL ADDRESS OF THE COORDINATOR: | tomasz.dabrowski@tu.koszalin.pl |
| COURSE TITLE: | Mathematics II |
| LECTURER'S NAME: | Dr hab. Volodymyr Sushch, Prof. PK |
| E-MAIL ADDRESS OF THE LECTURER: | volodymyr.sushch@tu.koszalin.pl |
| ECTS POINTS FOR THE COURSE: | 6 |
| ACADEMIC YEAR: | 2020/2021 |
| SEMESTER:<br>(W – winter, S – summer) | S |
| HOURS IN SEMESTER: | 30 + 30 |
| LEVEL OF THE COURSE:<br>(1st cycle, 2nd cycle, 3rd cycle) | 1st cycle |
| TEACHING METHOD:<br>(lecture, laboratory, group tutorials, seminar, other-what type?) | Lecture + practice |
| LANGUAGE OF INSTRUCTION: | English |
| ASSESSMENT METHOD:<br>(written exam, oral exam, class test, written reports, project work, presentation, continuous assessment, other – what type?) | Written exam |
| COURSE CONTENT: | **Integral calculus**<br>**The indefinite integral of real-valued functions of a single real variable:** formal definition, properties of integrals, finding the value of an integral (integration).<br>**Techniques for computing integrals:** integration by substitution, integration by parts, integration by trigonometric substitution, integration by reduction formulae, integration by partial fractions, integration using Euler's formula.<br>**The definite integral (the Riemann integral):** definition and properties, fundamental theorems of calculus (the Newton-Leibniz theorem).<br>**Applications of definite integrals:** calculating areas, volumes, arc length.<br>**Improper integrals:** convergence of the integral, singularities.<br><br>**Ordinary differential equations (ODE)**<br>**Basic concepts and classifying of differential equations:** solutions of differential equations (a particular solution and the general solution of a differential equation), initial-value and boundary-value problems.<br>**First order ODE:** separable equations, homogeneous equations, exact equations, linear equations (homogeneous and non-homogeneous), Bernoulli equations, solved problems.<br>**Second order linear ODE:** linear differential equations (linearly independent solutions, the Wronskian), linear |

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| | homogeneous ODE with constant coefficients, the characteristic equation, linear non-homogeneous ODE with constant, coefficients, the method of undetermined coefficients, variation of parameters, linear ODE with variable coefficients. |
| ADDITIONAL INFORMATION: | |

Volodymyr Sushch, 04.02.2020
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|---|---|
| FACULTY: | Civil Engineering, Environmental and Geodetic Sciences |
| FIELD OF STUDY: | Civil Engineering |
| ERASMUS COORDINATOR OF THE FACULTY: | Tomasz Dąbrowski PhD |
| E-MAIL ADDRESS OF THE COORDINATOR: | tomasz.dabrowski@tu.koszalin.pl |
| COURSE TITLE: | Mathematics III |
| LECTURER'S NAME: | Dr hab. Volodymyr Sushch, Prof. PK |
| E-MAIL ADDRESS OF THE LECTURER: | volodymyr.sushch@tu.koszalin.pl |
| ECTS POINTS FOR THE COURSE: | 4 |
| ACADEMIC YEAR: | 2020/2021 |
| SEMESTER:<br>(W – winter, S – summer) | S |
| HOURS IN SEMESTER: | 30 + 30 |
| LEVEL OF THE COURSE:<br>(1st cycle, 2nd cycle, 3rd cycle) | 1st cycle |
| TEACHING METHOD:<br>(lecture, laboratory, group tutorials, seminar, other-what type?) | Lecture + practice |
| LANGUAGE OF INSTRUCTION: | English |
| ASSESSMENT METHOD:<br>(written exam, oral exam, class test, written reports, project work, presentation, continuous assessment, other – what type?) | Written exam |
| COURSE CONTENT: | **Multiple integration**<br>**The double integral:** definition and properties, reduce the double integral to two integrals of one variable, interchange of the order of integration, normal domains on $\mathbf{R^2}$, methods of integration on normal domains, the change of variables in the double integral, transformation from Cartesian to polar coordinates, the formula of integration for the change of variables in polar coordinates, applications of the double integral.<br>**The triple integral:** definition and properties, reduce the triple integral to three integrals of one variable, normal domains on $\mathbf{R^2}$, integration on normal domains in $\mathbf{R^2}$, cylindrical coordinates, the integration formula for the change of variables in cylindrical coordinates, spherical coordinates, the integration formula for the change of variables in spherical coordinates, applications of the triple integral.<br>**A line integral (a curve integral):** the line integral of a scalar field, the line integral of a vector field, path independence, the contour integral, Green's theorem, applications.<br>**Series of real numbers**<br>**Notation and basic properties of series:** the partial sum of the series, examples (a geometric series, the harmonic series, the Dirichlet series), convergent series.<br>**Convergence tests:** the divergence test (the n-th term test), the comparison test, the limit comparison test, the ratio test, the root test, the integral test. |

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| | **An alternating series:** absolute convergence, conditional convergence (or semi- convergence), the alternating series test.<br>Tests for series with positive and negative terms: **the ratio test, the test of convergence in absolute value.** |
| ADDITIONAL INFORMATION: | |

Volodymyr Sushch, 04.02.2020
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|---|---|
| FACULTY: | Civil Engineering, Environmental and Geodetic Sciences |
| FIELD OF STUDY: | Civil Engineering |
| ERASMUS COORDINATOR OF THE FACULTY: | Tomasz Dąbrowski PhD |
| E-MAIL ADDRESS OF THE COORDINATOR: | tomasz.dabrowski@tu.koszalin.pl |
| COURSE TITLE: | Town planning and architecture |
| LECTURER'S NAME: | mgr inż. arch. Maciej Siekierski |
| E-MAIL ADDRESS OF THE LECTURER: | architekt@wilsig.tu.koszalin.pl |
| ECTS POINTS FOR THE COURSE: | 2 |
| ACADEMIC YEAR: | 2020/2021 |
| SEMESTER:<br>(W – winter, S – summer) | W or S |
| HOURS IN SEMESTER: | 15 |
| LEVEL OF THE COURSE:<br>(1st cycle, 2nd cycle, 3rd cycle) | 1st cycle |
| TEACHING METHOD:<br>(lecture, laboratory, group tutorials, seminar, other-what type?) | lecture/ group tutorials |
| LANGUAGE OF INSTRUCTION: | English |
| ASSESSMENT METHOD:<br>(written exam, oral exam, class test, written reports, project work, presentation, continuous assessment, other – what type?) | project work |
| COURSE CONTENT: | Architecture and urban planning - comparison of concepts. Principles of city design. Types of cities. The history of construction solutions in architecture. |
| ADDITIONAL INFORMATION: | The course is based on examples from Europe, Asia, Central America and South America. |

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| FACULTY: | Civil Engineering, Environmental and Geodetic Sciences |
| FIELD OF STUDY: | Civil Engineering |
| ERASMUS COORDINATOR OF THE FACULTY: | Tomasz Dąbrowski PhD |
| E-MAIL ADDRESS OF THE COORDINATOR: | tomasz.dabrowski@tu.koszalin.pl |
| COURSE TITLE: | Surveying 1 |
| LECTURER'S NAME: | Krzysztof Deska PhD |
| E-MAIL ADDRESS OF THE LECTURER: | krzysztof.deska@tu.koszalin.pl |
| ECTS POINTS FOR THE COURSE: | 5 |
| ACADEMIC YEAR: | 2020/2021 |
| SEMESTER:<br>(W – winter, S – summer) | W or S |
| HOURS IN SEMESTER: | 45 (15+30) |
| LEVEL OF THE COURSE:<br>(1st cycle, 2nd cycle, 3rd cycle) | 1st cycle |
| TEACHING METHOD:<br>(lecture, laboratory, group tutorials, seminar, other-what type?) | lecture 15 h + laboratory, group tutorials, individual consultations 30 h |
| LANGUAGE OF INSTRUCTION: | English |
| ASSESSMENT METOD:<br>(written exam, oral exam, class test, written reports, project work, presentation, continuous assessment, other – what type?) | class test, written reports, project work |
| COURSE CONTENT: | Basic principles in surveying. Geodetic reference system and reference points. Geodetic instruments: levels, precision levels, theodolites, EDM, manual and robotic total stations, GNSS receivers, optical and laser plummets. Construction, principles of operation, software, settings and usage of instruments. Techniques of measurement (distance, angles, precise GNSS positioning). Field measurements. |
| ADDITIONAL INFORMATION: | |

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| FACULTY: | Civil Engineering, Environmental and Geodetic Sciences |
| FIELD OF STUDY: | Civil Engineering |
| ERASMUS COORDINATOR OF THE FACULTY: | Tomasz Dąbrowski PhD |
| E-MAIL ADDRESS OF THE COORDINATOR: | tomasz.dabrowski@tu.koszalin.pl |
| COURSE TITLE: | Surveying 2 |
| LECTURER'S NAME: | Krzysztof Deska PhD |
| E-MAIL ADDRESS OF THE LECTURER: | krzysztof.deska@tu.koszalin.pl |
| ECTS POINTS FOR THE COURSE: | 5 |
| ACADEMIC YEAR: | 2020/2021 |
| SEMESTER:<br>(W – winter, S – summer) | W or S |
| HOURS IN SEMESTER: | 45 (15+30) |
| LEVEL OF THE COURSE:<br>(1st cycle, 2nd cycle, 3rd cycle) | 1st cycle |
| TEACHING METHOD:<br>(lecture, laboratory, group tutorials, seminar, other-what type?) | lecture 15 h + laboratory, group tutorials, individual consultations 30 h |
| LANGUAGE OF INSTRUCTION: | English |
| ASSESSMENT METOD:<br>(written exam, oral exam, class test, written reports, project work, presentation, continuous assessment, other – what type?) | class test, written reports, project work |
| COURSE CONTENT: | Design and field data processing, calculations. Basic map-making. Engineering surveying incl. i.a.: setting out engineering objects, methods of measuring deformation, research of horizontal and vertical displacement of structures and their surroundings. |
| ADDITIONAL INFORMATION: | |

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| FACULTY: | Civil Engineering, Environmental and Geodetic Sciences |
| FIELD OF STUDY: | Civil Engineering |
| ERASMUS COORDINATOR OF THE FACULTY: | Tomasz Dąbrowski PhD |
| E-MAIL ADDRESS OF THE COORDINATOR: | tomasz.dabrowski@tu.koszalin.pl |
| COURSE TITLE: | Terrestrial laser scanning |
| LECTURER'S NAME: | dr inż. Czesław Suchocki |
| E-MAIL ADDRESS OF THE LECTURER: | czeslaw.suchocki@tu.koszalin.pl |
| ECTS POINTS FOR THE COURSE: | 3 |
| ACADEMIC YEAR: | 2020/2021 |
| SEMESTER:<br>(W – winter, S – summer) | W or S |
| HOURS IN SEMESTER: | 30 |
| LEVEL OF THE COURSE:<br>(1st cycle, 2nd cycle, 3rd cycle) | 1st cycle |
| TEACHING METHOD:<br>(lecture, laboratory, group tutorials, seminar, other-what type?) | group tutorials, individual consultations |
| LANGUAGE OF INSTRUCTION: | English |
| ASSESSMENT METHOD:<br>(written exam, oral exam, class test, written reports, project work, presentation, continuous assessment, other – what type?) | project work / presentation |
| COURSE CONTENT: | The theoretical background of TLS, laser equation, principles of scanner measurement, practical TLS measurements, diagnostic measurements of buildings, post-processing of point clouds: registration of point clouds, radiometric dataset analysis, modeling, defect detection of building wall. |
| ADDITIONAL INFORMATION: | |

……Suchocki Czesław, 03.03.2020……..
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| FACULTY: | Civil Engineering, Environmental and Geodetic Sciences |
| FIELD OF STUDY: | Civil Engineering |
| ERASMUS COORDINATOR OF THE FACULTY: | Tomasz Dąbrowski PhD |
| E-MAIL ADDRESS OF THE COORDINATOR: | tomasz.dabrowski@tu.koszalin.pl |
| COURSE TITLE: | Soil Mechanics |
| LECTURER'S NAME: | Magdalena Pietrzak, Iwona Radosz, Jarosław Filipiak |
| E-MAIL ADDRESS OF THE LECTURER: | kgeo@tu.koszalin.pl, magdalena.pietrzak@tu.koszalin.pl, iwona.radosz@tu.koszalin.pl, prikret@poczta.onet.pl |
| ECTS POINTS FOR THE COURSE: | 2 |
| ACADEMIC YEAR: | 2020/2021 |
| SEMESTER:<br>(W – winter, S – summer) | W or S |
| HOURS IN SEMESTER: | 30 |
| LEVEL OF THE COURSE:<br>(1st cycle, 2nd cycle, 3rd cycle) | 1st cycle |
| TEACHING METHOD:<br>(lecture, laboratory, group tutorials, seminar, other-what type?) | laboratory, group tutorials |
| LANGUAGE OF INSTRUCTION: | English/Polish |
| ASSESSMENT METHOD:<br>(written exam, oral exam, class test, written reports, project work, presentation, continuous assessment, other – what type?) | oral exam, class test, written reports, project work, presentation, continuous assessment, |
| COURSE CONTENT: | Three phases of soil model and parameters of its description. Physical and chemical properties of soils. Soil Composition, Soil consistency: compaction and Atterberg limits. Heaving soils. Groundwater types. Water flow in soils. Coefficient of Permeability, Concept of effective stresses. Stress and strain paths. The simplest soil constitutive models (elastic and elastic-perfectly plastic with Coulomb – Mohr failure surface) and their parameters. Compressibility and consolidation. Distribution of stresses in the subsoil. Strength behavior of soils Rankine's theory. Behavior of Clayey Soils Stress in soils due to external load.<br>Laboratory: Atterberg limits and Proctor compaction test. Geotechnical documentation: geotechnical-engineering cross-sections of substratum |
| ADDITIONAL INFORMATION: | |

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| FACULTY: | Civil Engineering, Environmental and Geodetic Sciences |
| FIELD OF STUDY: | Civil Engineering |
| ERASMUS COORDINATOR OF THE FACULTY: | Tomasz Dąbrowski PhD |
| E-MAIL ADDRESS OF THE COORDINATOR: | tomasz.dabrowski@tu.koszalin.pl |
| COURSE TITLE: | Engineering Geology Laboratory |
| LECTURER'S NAME: | Urszula Żurek-Pysz, PhD |
| E-MAIL ADDRESS OF THE LECTURER: | urszula.zurek-pysz@tu.koszalin.pl |
| ECTS POINTS FOR THE COURSE: | 1 |
| ACADEMIC YEAR: | 2020/2021 |
| SEMESTER:<br>(W – winter, S – summer) | S |
| HOURS IN SEMESTER: | 15 |
| LEVEL OF THE COURSE:<br>(1st cycle, 2nd cycle, 3rd cycle) | 1st cycle |
| TEACHING METHOD:<br>(lecture, laboratory, group tutorials, seminar, other-what type?) | laboratory |
| LANGUAGE OF INSTRUCTION: | English |
| ASSESSMENT METHOD:<br>(written exam, oral exam, class test, written reports, project work, presentation, continuous assessment, other – what type?) | Written reports, presentation |
| COURSE CONTENT: | Identification of minerals, rocks and soils, Geotechnical Engineering Report |
| ADDITIONAL INFORMATION: | |

Urszula Żurek-Pysz, 19.03.2020

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| FACULTY: | Civil Engineering, Environmental and Geodetic Sciences |
| FIELD OF STUDY: | Civil Engineering |
| ERASMUS COORDINATOR OF THE FACULTY: | Tomasz Dąbrowski PhD |
| E-MAIL ADDRESS OF THE COORDINATOR: | tomasz.dabrowski@tu.koszalin.pl |
| COURSE TITLE: | Advanced Building Chemicals |
| LECTURER'S NAME: | dr hab. Paweł K. Zarzycki, prof. PK |
| E-MAIL ADDRESS OF THE LECTURER: | pkzarz@wp.pl |
| ECTS POINTS FOR THE COURSE: | 3 |
| ACADEMIC YEAR: | 2020/2021 |
| SEMESTER:<br>(W – winter, S – summer) | S |
| HOURS IN SEMESTER: | 30 |
| LEVEL OF THE COURSE:<br>(1st cycle, 2nd cycle, 3rd cycle) | 1st cycle |
| TEACHING METHOD:<br>(lecture, laboratory, group tutorials, seminar, other-what type?) | Group tutorials and/or Seminar |
| LANGUAGE OF INSTRUCTION: | English |
| ASSESSMENT METHOD:<br>(written exam, oral exam, class test, written reports, project work, presentation, continuous assessment, other – what type?) | Written reports and/or presentation |
| COURSE CONTENT: | This course is focusing on the future of chemicals and advanced complex materials, which are used in buildings/constructions. All aspects of hybrid and smart chemicals that are manufactured and can be implemented for advanced buildings, including new nanomaterials, will be discussed from a practical point of view. Moreover, ecotoxicological impact of engineered chemicals and nanomaterials on environment and the humans will be evaluated, based on data available in scientific literature. |
| ADDITIONAL INFORMATION: | LITERATURE:<br>**[1]** A. M. Grumezescu (Editor), Handbook of Food Bioengineering, Volume 19; Role of Material Science in Food Bioengineering; Chapter 3, pp 73-107: K. Mitura, P.K. Zarzycki; Biocompatibility and Toxicity of Allotropic Forms of Carbon in Food Packaging; Academic Press/Elsevier 2018, ISBN: 978-0-12-811448-3; PII: B978-0-12-811448-3.00003-6; DOI: http://dx.doi.org/10.1016/B978-0-12-811448-3.00003-6<br>**[2]** P.K. Zarzycki, Editor, "Pure and Functionalized Carbon Based Nanomaterials: Analytical, Biomedical, Civil and Environmental Engineering Applications", CRC Press, 2020 |

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| FACULTY: | Civil Engineering, Environmental and Geodetic Sciences |
| FIELD OF STUDY: | Civil Engineering |
| ERASMUS COORDINATOR OF THE FACULTY: | Tomasz Dąbrowski PhD |
| E-MAIL ADDRESS OF THE COORDINATOR: | tomasz.dabrowski@tu.koszalin.pl |
| COURSE TITLE: | Precise GNSS positioning |
| LECTURER'S NAME: | Krzysztof Deska PhD |
| E-MAIL ADDRESS OF THE LECTURER: | krzysztof.deska@tu.koszalin.pl |
| ECTS POINTS FOR THE COURSE: | 5 |
| ACADEMIC YEAR: | 2020/2021 |
| SEMESTER:<br>(W – winter, S – summer) | W or S |
| HOURS IN SEMESTER: | 45 (15+30) |
| LEVEL OF THE COURSE:<br>(1st cycle, 2nd cycle, 3rd cycle) | 1st cycle |
| TEACHING METHOD:<br>(lecture, laboratory, group tutorials, seminar, other-what type?) | lecture 15 h + laboratory, group tutorials, individual consultations 30 h |
| LANGUAGE OF INSTRUCTION: | English |
| ASSESSMENT METOD:<br>(written exam, oral exam, class test, written reports, project work, presentation, continuous assessment, other – what type?) | class test, written reports, project work |
| COURSE CONTENT: | Reference coordinate systems. Global Navigation Satellite Systems. GNSS observations and standards. Settings and usage of instruments. Field measurements: static, RTK, RTN. Techniques of measurement of hidden-points. GNSS data post-processing software and usage. |
| ADDITIONAL INFORMATION: | |

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| FACULTY: | Civil Engineering, Environmental and Geodetic Sciences |
| FIELD OF STUDY: | Civil Engineering |
| ERASMUS COORDINATOR OF THE FACULTY: | Tomasz Dąbrowski PhD |
| E-MAIL ADDRESS OF THE COORDINATOR: | tomasz.dabrowski@tu.koszalin.pl |
| COURSE TITLE: | Electronic techniques of measurement |
| LECTURER'S NAME: | Krzysztof Deska PhD |
| E-MAIL ADDRESS OF THE LECTURER: | krzysztof.deska@tu.koszalin.pl |
| ECTS POINTS FOR THE COURSE: | 5 |
| ACADEMIC YEAR: | 2020/2021 |
| SEMESTER:<br>(W – winter, S – summer) | W or S |
| HOURS IN SEMESTER: | 45 (15+30) |
| LEVEL OF THE COURSE:<br>(1st cycle, 2nd cycle, 3rd cycle) | 1st cycle |
| TEACHING METHOD:<br>(lecture, laboratory, group tutorials, seminar, other-what type?) | lecture 15 h + laboratory, group tutorials, individual consultations 30 h |
| LANGUAGE OF INSTRUCTION: | English |
| ASSESSMENT METOD:<br>(written exam, oral exam, class test, written reports, project work, presentation, continuous assessment, other – what type?) | class test, written reports, project work |
| COURSE CONTENT: | Geodetic instruments: levels, precision levels, theodolites, EDM, manual and robotic total stations, optical and laser plummets. Construction, principles of operation, software, settings and usage of instruments. Laboratory procedures using collimators for testing, calibrating and adjusting geodetic instruments. Field procedures for testing. Techniques of measurement using geodetic instruments. |
| ADDITIONAL INFORMATION: | Field procedures for testing geodetic instruments in accordance with ISO 17123 standards. |

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| FACULTY: | Civil Engineering, Environmental and Geodetic Sciences |
| FIELD OF STUDY: | Civil Engineering |
| ERASMUS COORDINATOR OF THE FACULTY: | Tomasz Dąbrowski PhD |
| E-MAIL ADDRESS OF THE COORDINATOR: | tomasz.dabrowski@tu.koszalin.pl |
| COURSE TITLE: | Wastewater treatment systems |
| LECTURER'S NAME: | Krzysztof Piaskowski |
| E-MAIL ADDRESS OF THE LECTURER: | krzysztof.piaskowski@tu.koszalin.pl |
| ECTS POINTS FOR THE COURSE: | 3 |
| ACADEMIC YEAR: | 2020/2021 |
| SEMESTER:<br>(W – winter, S – summer) | S |
| HOURS IN SEMESTER: | 30 |
| LEVEL OF THE COURSE:<br>(1st cycle, 2nd cycle, 3rd cycle) | 1st cycle |
| TEACHING METHOD:<br>(lecture, laboratory, group tutorials, seminar, other-what type?) | lecture |
| LANGUAGE OF INSTRUCTION: | English |
| ASSESSMENT METOD:<br>(written exam, oral exam, class test, written reports, project work, presentation, continuous assessment, other – what type?) | Written exam |
| COURSE CONTENT: | Lectures include topics on current issues of municipal wastewater treatment. The basic quality parameters of wastewater, their impact on the environment, processes and technologies used in sewage treatment plants and devices are discussed. Particular attention is paid to the processes of biological removal of nutrients from wastewater and the diversity of integrated wastewater treatment systems. |
| ADDITIONAL INFORMATION: | Lectures are conducted in the multimedia form and end with a visit to the municipal sewage treatment plant. |

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| FACULTY: | Civil Engineering, Environmental and Geodetic Sciences |
| FIELD OF STUDY: | Civil Engineering |
| ERASMUS COORDINATOR OF THE FACULTY: | Tomasz Dąbrowski PhD |
| E-MAIL ADDRESS OF THE COORDINATOR: | tomasz.dabrowski@tu.koszalin.pl |
| COURSE TITLE: | Technology and properties of ordinary concrete |
| LECTURER'S NAME: | dr inż Janusz Kobaka |
| E-MAIL ADDRESS OF THE LECTURER: | janusz.kobaka@tu.koszalin.pl |
| ECTS POINTS FOR THE COURSE: | 3 |
| ACADEMIC YEAR: | 2020/2021 |
| SEMESTER:<br>(W – winter, S – summer) | S |
| HOURS IN SEMESTER: | 30 |
| LEVEL OF THE COURSE:<br>(1st cycle, 2nd cycle, 3rd cycle) | 2nd cycle |
| TEACHING METHOD:<br>(lecture, laboratory, group tutorials, seminar, other-what type?) | group tutorials & laboratory |
| LANGUAGE OF INSTRUCTION: | English |
| ASSESSMENT METHOD:<br>(written exam, oral exam, class test, written reports, project work, presentation, continuous assessment, other – what type?) | project work & presentation |
| COURSE CONTENT: | Aggregates: types, testing and properties Cement as a binder. Mix designing. Workability and other properties of a fresh concrete mix. Hardened concrete and its testing. Strength classes according to European standards. Durability associated properties. |
| ADDITIONAL INFORMATION: | Course based on European standards. |

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