**COURSE DESCRIPTION**

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| ***Name of the course:*** | LOAD-BEARING STRUCTURES 1  REINFORCED CONCRETE STRUCTURES |
| *Code of course:* | PMRSTNE029A |
| ***Number of lectures per week***  ***(lecture/practical):*** | 2 / 2 |
| ***Requirement:*** | Exam |
| ***Credits (ECTS):*** |  |
| ***Propsed term:*** | ***2nd*** |
| ***Department:*** | Department of Civil Engineering |
| *Preliminary study requirement*: | MECHANICS 2 (MECHANICS OF MATERIALS) |
| ***Programme:*** | Architect MSC, Erasmus |
| ***Aim:*** Provision of basic knowledge in the field of reinforced concrete structures design according to Eurocode 2 standard. | |
| ***Short description:*** Principles of design of reinforced concrete structures. Stress states of cross-sections. Design methods of reinforced concrete beams, columns and slabs in ultimate and serviceability limit states. Design rules according to Eurocode 2. | |
| ***Other important informations*** | |
| ***Course leader /lecturer/:***  ***Practical teacher:*** | Zoltan ORBAN, PhD /Tamas JUHASZ/  Tamas JUHASZ |
| ***Language*:** | English |
| ***Terms of certification:*** | Obtainable amount of points during the term: 100 points   * Test: 50 points * Homeworks: 50 points   In all cases, 50% in power required |
| ***Exam:*** | Written examination in the examination period. (50 points) At least 50% in power required. |
| ***Marks:*** | By the total power during the term:  Fail (1) - 49,9% -150 pont  Pass (2) 50,0% - 62,9% pont  Satisfactory (3) 63,0% - 73,9% pont  Good (4) 74,0% - 84,9% pont  Excellent (5) 85,0% - 100% |
| ***Educational materials:*** | James G. Macgregor, James K. WightReinforced Concrete: Mechanics and Design (5th Edition)  ISBN-13: 9780132281416 |
| ***Terms of registration:*** | via NEPTUN system |

DETAILED SCHEDULE

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| **Number**  **of week** | **Lecture** | **Practical** |
| 1. | Historical overview | Introduction, registration. |
| 2. | Material propreties of concrete and reinforcing steel. | Mechanical properties of elastic inhomogeneous cross-sections. |
| 3. | Uncracked and cracked cross-sections. | Analysis of uncracked and cracked cross-sections. |
| 4. | Basic of design. Stress state #3. Rigid-plastic concrete model. | Controllof cross-sections in bending. |
| 5. | One way reinforced concrete slabs. | Introduction of the homework. |
| 6. | Design procedure of cross-sections in bending. Constraint and unconstraint methods. | Design of beam cross-sections in bending#1 |
| 7. | Design for shear effect #1 | Design of beam cross-sections in bending#2 |
| 8. | Design for shear effect #2 | Design for shear effect. Sapcing of stirrups. |
| 9. | Complex design of reinforced concrete beams in shear and bending. Bond in concrete. | Design for shear effect. |
| 10. | EASTER BREAK | |
| 11. | Biaxial bending. Reinforced concrete columns. | Analysis of reinforced concrete beams in complex effects of shear and bending. Anchoring length of rebars. |
| 12. | Reinforced concrete columns. | Interaction curve for compression and uniaxial bending (biaxial) bending. |
| 13. | Two way reinforced concrete slabs and frames. Bracing of high-rise buildings. | Oneway slabs. |
| 14. | Serviceability limit states. | Consultation |
| 15. | Test | |

Tamas JUHASZ

Lecturer