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| **Title and Code** of the subject: **Electrotechnics MTBE7006A** | **ECTS Credit Points: 4** |
| **Type** of the subject: **compulsory** / optional | |
| **Ratio of theory and practice: 50/50** (credit%) | |
| **Type and number of classes per semester**: 2 hour(s) lecture and 2 hour(s) practice per **semester**  Number of teaching hours / week : eg.:2+2 (lecture and practice) | |
| **Type of exam**: exam / **practical** course mark | |
| **Subject in the curriculum:** semester 2. | |
| Preliminary requirements:- | |

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| **Summary of content - theory**: |
| Course objectives:  Schedule:   1. Electrostatics, DC networks: basic electrical concepts of electric charge, electric current (amperage), electric field, electric field work, electric voltage (potential), electric circuit 2. Power source (ideal real), Power Source (ideal for real), Consumer, Ohm's Law, Resistance - design, characteristic data, division, marking according to IEC standard. 3. Passive resistance of bipolar networks, Star-delta, delta-star conversion, Electrical work, electric power, efficiency 4. Network analysis: Kirchhoff’s laws, Voltage divider, potentiometer, extending measuring range of a Volt meter current divider, extending measuring range of an Amp meter, Wheatstone bridge 5. Network analysis: Nodal analysis, Mesh analysis, superposition theory 6. Network analysis: Northon and Thevenin theory 7. 1.Test 8. AC circuit, complex number, AC circuit mean value (RMS). 9. Behavior of a resistance in AC circuit, inductance behavior in AC circuit, capacitance behavior in AC circuit. 10. AC circuit network analysis, AC Kirchhoff’s laws 11. Performance of AC circuits, power factor correction, Three-phase systems 12. Transient signals in the AC circuits 13. Advanced alternating current circuits: RL, RC, RLC circuits, parallel RL, RC, RLC circuits. 14. 2. Test |
| **Summary of content - practice**: |
| Skills to be learnt:…  Schedule:   1. General description, laboratory regulations, Safety regulations and safety instruction 2. introduction to measurements and instrumentation (measuring error, power supply, digital multimeter, signal generator) 3. 1st measurement: measuring the characteristics of DC voltage (U, I, RB, P) using Ohm's Law. Report writing. 4. 2nd measurement: measuring the values of DC circuit. Using Kirchhoff’s laws. Report writing. 5. 3rd measurement: measuring the values of DC circuit. Using voltage and current divider. Report writing. 6. 4th measurement: Perform a complex DC measurement and calculation task. Report writing. 7. Repeat practice and consultation. 8. 5th measurement introduction to AC measurements and instrumentation (AC type digital multimeter, signal generator, oscilloscope, LRC meter). Report writing. 9. 6th measurement: Alternating current,voltage characteristics measurement (Ueff, Ieff, f, P, waveform) using Ohm’s law. Report writing. 10. 7th measurement: alternating current analysis of capacitive and inductive elements. Analysis of serial and parallel RLC circuits. Report writing. 11. 8th measurement: alternating current analysis of wien-bridge. Report writing. 12. 9th measurement: Measuring of serial RLC circuit. Report writing. 13. 10th measurement: Measuring of parallel RLC circuit. Report writing. 14. Repeat practice and consultation. |
| **Literature, handbooks in English** |
| 1. Electronic Circuits: Handbook for Design and Application, U. Tietze, Ch. Schenk, 2nd edition, 2008, ISBN-10: 3540004297 |
| **Competencies gained** *(acc. to the Regulation on training and outcome requirements)* |
| 1. **Knowledge:**  * xx * xx  1. **Skills:**  * xx * xx  1. **Attitude:**  * xx  1. **Autonomy and responsibility:**  * xx |

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| **Responsible lecturer: Kornél Sarvajcz** |
| **Other lecturer(s): Gyula Darai** |

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| **Terms of course completion:** |
| 1. Completing assignments / exercises |
| **Form of examination:** |
| test |
| **Requirement(s) to get signature:** |
| Attendance at lectures is recommended, but not compulsory. Participation at practice classes is compulsory. A student must attend the practice classes and may not miss more than three times during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. A student can’t make up a practice class with another group. Attendance at practice classes will be recorded by the practice leader. Being late is equivalent with an absence. Missed practice classes must be made up for at a later date, being discussed with the tutor. Active participation is evaluated by the teacher in every class. If student’s behavior or conduct doesn’t meet the requirements of active participation, the teacher may evaluate his/her participation as absence because of the lack of active participation in class. During the semester there is one test. Students have to sit for this test.  Preparing measurement reports until deadline. |

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| **Exam questions:** |
| 1. Apply the Kirchoff, Mesh and Nodal analysis. 2. Apply the Norton and Thévenin theorem. 3. Determine with calculation the active power, reactive power and complex power |