

Thematic for the entrance exam (interview)

Master study program: **Advanced Electrical Systems (in English)**

Admission session 2023

Examination - part 1

The candidate will concisely present a personal research project (e.g. the diploma thesis) for maximum 5 minutes, with a focus on the following thematic areas:

- 1) Power factor correction in electrical installations;
- 2) Electrical measurements;
- 3) Induction machine – mechanical characteristics torque-speed, torque-slip;
- 4) Three-phase two-level PWM inverters;
- 5) D.C.-D.C. PWM converters;
- 6) Low voltage switching equipment;
- 7) Low voltage protection equipment;
- 8) Power calculation in AC circuits;
- 9) Renewable energy sources;
- 10) Sensors;

Recommended minimal bibliography:

- [1] Schneider Electric, Electrical Installation Guide, Chapters: L (power factor correction); H (LV switchgear); Online: <https://www.se.com/ww/en/download/document/EIGED306001EN/>
- [2] J.G. Webster, The Measurement, instrumentation, and sensors : handbook, CRC Press, 1999, Chapters: 37 (Voltage measurement); 38 (Current measurement); 39 (Power Measurement).
- [3] Stephen J. Chapman, Electric Machinery Fundamentals - Fourth Edition, Chapter 7.5 (Induction Motor Torque-Speed Characteristics);
- [4] M.H. Rashid, Power electronics handbook, Elsevier, 2011, Chapters: 13 (DC/DC converters); 15.3 (Three-phase voltage source inverters);
- [5] N. Riedel, Electric Circuits – 8th edition, Pearson Education, 2008, Chapter 10 (Sinusoidal Steady-state power calculations);
- [6] G.B. Masters, Renewable and efficient electric power systems, Wiley-Interscience, 2004, Chapters: 4.5 (Micro-Hydropower Systems); 6.2-6.6 (Wind Power - basics); 8.3-8.6 (Photovoltaic power - basics) .
- [7] J.S. Wilson, Sensor Technology Handbook, Elsevier, 2005, Chapters: 1 (Sensor Fundamentals); 4 (Sensor Signal Conditioning).

Examination - part 2

Brief presentation of the professional development plan of the candidate

The candidate will prepare a 5-minute presentation, considering the following:

- the current skills, technical interests and strengths;
- the selected study track for the master programme, providing a motivation for his option;
- the topic for the dissertation thesis that would fit best his technical interests;
- the targeted profession and provide a brief explanation of how this master programme will contribute to move his career forward.
- the current research interest and whether he would consider following a PhD programme after graduating the master programme, which would make him eligible for a potential academic career.

Recommended bibliography:

- [1] <https://www.accessmasterstour.com/articles/view/make-your-career-plan-in-graduate-school>
- [2] <https://www.indeed.com/career-advice/career-development/professional-development-plan>
- [3] <https://capd.mit.edu/resources/make-a-career-plan/>

Note: The oral examination will be conducted in English and will last approximately 10 minutes per candidate. Prior to the exam, the candidates must pass an English language competence test. The test is not required for the candidates who can provide an English language competence document issued by an institution recognized by the Romanian Ministry of Education.