

UNIVERSITY OF NYÍREGYHÁZA

Institute of Engineering and Agricultural Sciences

Department of Transport Sciences and Information Technology

SEMESTER COURSE PLAN

Subject: Electronics and Electrical Engineering, **code:** BAI0080

Lecturer: Rafael Ruben Boros PhD, **practical instructor:** Tamás Pásztor

Lecture: 2 hours/week, 28 hours/semester; **practical class:** 3 hours/week, 42 hours/semester

Assessment method: colloquium (semester exam) – see: [below](#)

A pre-assigned (offered) grade can be earned during the semester, based on the following components (without separate minimum requirements):

- | | |
|--|------------------|
| – Active participation in laboratory sessions | 20 points |
| – Completion of the first midterm test | 40 points |
| – <u>Completion of the second midterm test</u> | <u>40 points</u> |

Total: 100 points

Cut-off scores and grades:

- | | |
|--------------|-----------------|
| – excellent | 90 – 100 points |
| – good | 80 – 89 points |
| – average | 70 – 79 points |
| – sufficient | 60 – 69 points |

Midterms & lab sessions cannot be made up. If the student does not obtain an offered grade, the end-of-semester exam grade shall be considered the final grade (excluding midterms & lab sessions).

Absence (both verified and unverified) from practical sessions more than 3 times during the semester will result in the loss of not only the opportunity to obtain the offered grade, but also the condition for being admitted to the exam (the student will repeat the course next year) – see: [Regulations on Studies and Examinations](#) 8. § (1.).

Absences must be reported - with proof, via email, etc. - no later than the week in which they occurred! NOT two weeks later, and certainly NOT at the end of the semester! These are NOT accepted such late notifications!

If you are unable to attend the practical session you signed up for in NEPTUN FOR ANY REASON, please attend a different session that week! You may complete the session at any time during the current week, but NOT in a different week.

Nyíregyháza, 2026. 08. 28.

Rafael Ruben Boros PhD
course coordinator

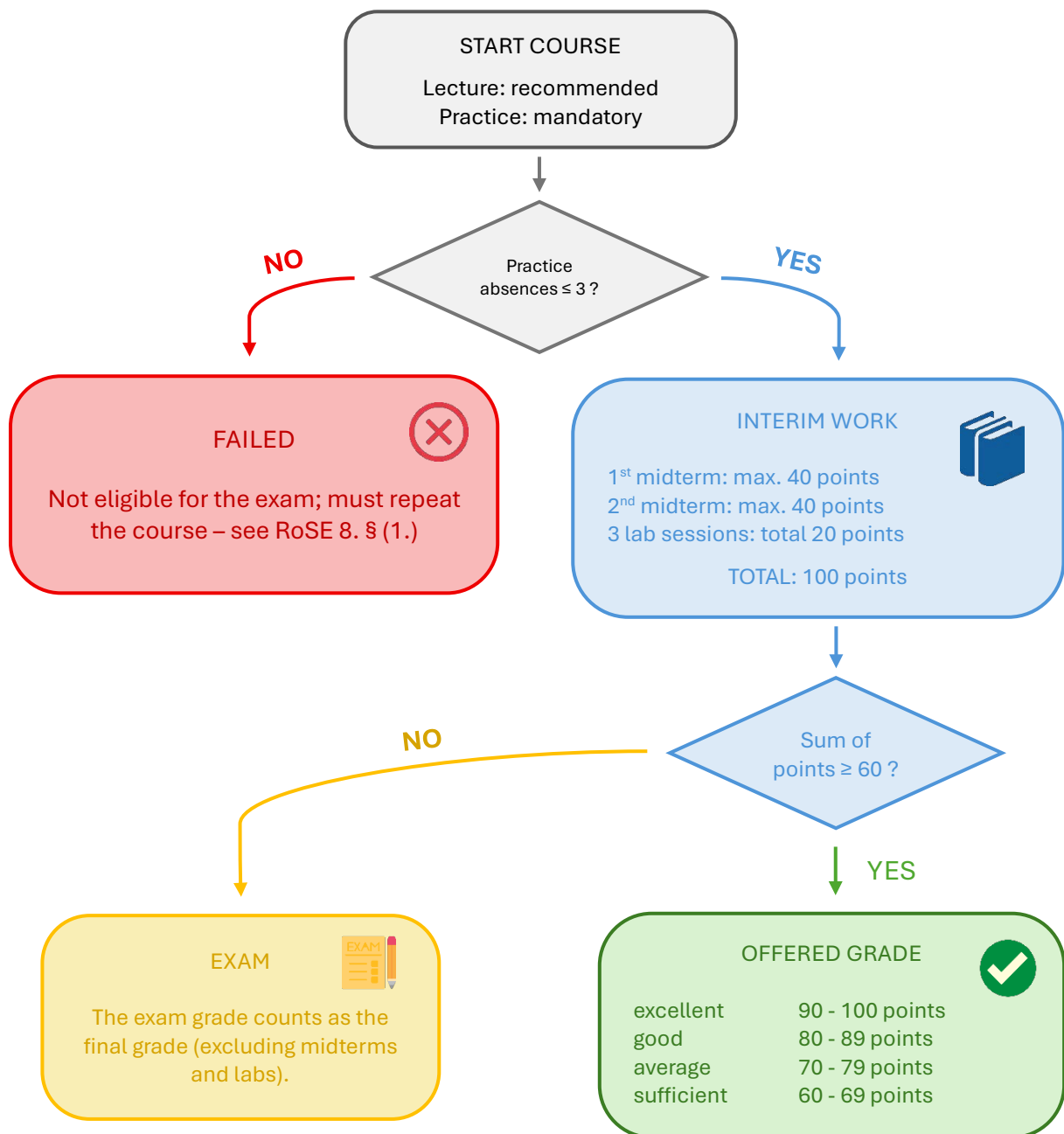
Week	Lecture	Hours	Practice	Hours
37.	Physics concepts: Electric and magnetic fields	2	Occupational health and safety training	3
38.	Electrotechnical principles and calculation methods	2	Solving tasks	3
39.	AC circuits: Single-phase and three-phase networks	2	Solving tasks	3
40.	Single-phase and three-phase transformers	2	Solving tasks	3
41.	Characteristics of DC electrical machines	2	Solving tasks	3
42.	Characteristics of AC electrical machines	2	Solving problems Preparing for the midterm test	3
43.	FALL BREAK	-	FALL BREAK	-
44.	FIRST MIDTERM TEST Fundamentals of measurement technology ; P-type and N-type semiconductors	2	Familiarization with measurement techniques; introduction to the <i>DEGEM Systems EB2000</i>	3
45.	Diodes: Rectifier circuits; Zener diode; Voltage regulators	2	Diode forward voltage, rectifiers, Zener voltage regulator (EB111)	3
46.	Bipolar transistors: Structure; circuit configurations, characteristic curves	2	Transistor current gain, common-emitter configuration (EB111)	3
47.	Field-effect transistors: Structure; circuits, characteristic curves	2	Independent practice 1 Analysis of combinational and sequential circuits (EB131, EB132, EB133)	3
48.	Amplifiers, operational amplifiers: Characteristic parameters, properties, circuits	2	Independent practice 2 Introduction to simulation environments – FreeCircuitSim , TinkerCAD	3
49.	Controlled rectifiers: Thyristors, DIACs, TRIACs, and IGBTs	2	Introduction to simulation environments – FreeCircuitSim , TinkerCAD	3
50.	Special circuit components: varistors, thermistors, photoresistors, and piezoelectric materials	2	Independent practice 3 Preparing for the second midterm test	3
51.	SECOND MIDTERM EXAM Digital circuits	2	Summary Preparing for the final exam	3

Moodle-course:

[Elektronika és elektrotechnika / Electronics & electrical engineering \(BAI0080\)](#)

Recommended reading:

- **Alexander, Charles K. – Sadiku, Matthew N. O.:** *Fundamentals of Electric Circuits*. McGraw-Hill Education, New York, 7th Edition, 2021. ISBN 978-1260226409
- **Chapman, Stephen J.:** *Electric Machinery Fundamentals*. McGraw-Hill Education, New York, 5th Edition, 2011. ISBN 978-0073529547
- **Horowitz, Paul – Hill, Winfield:** *The Art of Electronics*. Cambridge University Press, Cambridge, 3rd Edition, 2015. ISBN 978-0521809269
- **Floyd, Thomas L.:** *Electronic Devices*. Pearson, 10th Edition, 2018. ISBN 978-0134414447
- **Helfrick, Albert D. – Cooper, William D.:** *Modern Electronic Instrumentation and Measurement Techniques*. Pearson Education. ISBN 978-0135935682



- ⇒ Prerequisite for exam registration: a maximum of 3 absences – see RoSE 8. § (1.)
- ⇒ Absences must be reported - with proof, via email, etc. - no later than the week in which they occur! NOT two weeks later, and certainly NOT at the end of the semester! Such reports are NOT accepted!
- ⇒ If you cannot attend your scheduled practical session (flight practice, etc.), please attend a different session (check Neptun for details)! You can make up the specific session within the same week, but NOT on a different week!

