

Electrotechnics (IInd Year of study, IIIrd Semester)

Credit value (ECTS) 4

Course category

Domain (Imposed)

Course holder:

Assoc. Prof. Dr. Eng. Petru Marian CÂRLESCU

Discipline objectives (course and practical works)

The aim of the course is to acquire basic theoretical knowledge of electrotechnics with applicability in the food industry.

The practical work is aimed at familiarizing students with the phenomena of magnetism and electromagnetism applicable in the technical field, aiming at acquiring knowledge about electrical machines and their operation, as well as practical skills regarding the methods of measurement of specific electrical quantities, methods of starting and adjusting these machines, choosing the right measuring devices, performing experimental assemblies and interpreting experimental data.

Contents (syllabus)

Course (chapters/subchapters)
Magnetism: introduction, materials
Electromagnetism: electromagnetic fields, ferromagnetic core coils
Transformers: monophasic transformer, rotary-current transformer, special transformers.
Electric machines: general elements, construction, materials.
Magnetic fields on AC machines: rotating magnetic field, generating the rotating magnetic field with a symmetrical rotary-current system.
Asynchronous machines: operating principle, energy balance, electromagnetic torque, natural mechanical characteristic and artificial mechanical characteristics, stable operating range, starting and starting methods, speed control methods.
Synchronous machines: general elements, construction, operation mode.
Choosing electric motors for the food industry.

Practical works
General NTS and PSI training and first aid measures in the event of electric shock; the symbolism of electrical devices.
Monophasic transformer for no-load and load operation.
Special transformers. Variac.
Wound-rotor motor. Starting with resistance in the rotor circuit. Determination of sliding and mechanical characteristics.
Starting methods of three-phase asynchronous motors with short-circuit rotor.
The use of rotary-current asynchronous motors in monophasic circuits.

Methods of adjusting the speed of the asynchronous motor to the short-circuited rotor.

Final colloquium of knowledge evaluation.

Bibliography

1. Crețu A. – *Electrotehnică și mașini electrice*. – Curs, Rotaprint IP, Iași, 1990.
2. Kuznețov M. I. – *Electrotehnică industrială*. Ed. Tehnică., Bucuresti.
3. Cristea Gh. si colab. – *Elemente fundamentale de fizică*. Vol. II, Ed. Dacia, 1985.
4. Vasilache V. - *Electrotehnică și mașini electrice*. – *Îndrumar de laborator*, Rotaprint IP, Iași, 1982.
5. Haba P. - *Electrotehnică și mașini electrice*. – *Îndrumar de laborator*, Rotaprint IP, Iași, 1985.
6. *Bazele mașinilor electrice*. – *Module de învățare și aplicații practice*, Christiani, Germania 2018.

Evaluation

Evaluation form	Evaluation Methods	Percentage of the final grade
Exam	Writing examination	60%
Appreciation of the activity during the semester	Oral assessment during the semester, verification tests and final laboratory colloquium.	40%

Contact

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