

Tárgytematika / Course Description Electric Machines and Drives

GKNM_AUTA009

Tárgyfelelős neve /

Teacher's name: dr. Kuczmann Miklós

Félév / Semester: 2025/26/1

Beszámolási forma /

Assesment: Vizsga

Tárgy heti óraszám /

Teaching hours(week): 2/0/0

Tárgy féléves óraszám /

Teaching hours(sem.): 0/0/0

OKTATÁS CÉLJA / AIM OF THE COURSE

Aim of the course:

Introduction to modern AC electric machines and drives.

TANTÁRGY TARTALMA / DESCRIPTION

Description:

Week 1. Getting to know the MATLAB/Simulink environment for dynamic simulation of electric machines and drives.

Week 2. Dynamic modeling of induction machines.

Week 3. Implementation and simulation of induction machine model in MATLAB/Simulink environment.

Week 4. Vector control methods of induction machine drives.

Week 5. Speed sensorless estimation and control solutions for induction machine drives.

Week 6. Model-based control algorithm development for AC drives.

Week 7. Classification, components and operation of the various synchronous machine types.

Week 8. The modeling of the permanent magnet synchronous motor.

Week 9. Simulation of the permanent magnet synchronous motor.

Week 10. The components of the permanent magnet synchronous motor drive.

Week 11. The control of the permanent magnet synchronous motor drive.

Week 12. The sensorless control methods applied to permanent magnet synchronous motor drives.

Week 13. Laboratory exercise: induction machine tests

Week 14. Laboratory exercise: synchronous machine tests

SZÁMONKÉRÉSI ÉS ÉRTÉKELÉSI RENDSZERE / ASSESSMENT'S METHOD

Assessment's method:

Students can complete the subject with at least two sufficient written tests during the semester. Or the subject

can also be completed with a written exam during the exam period. Grade is determined as follows:

0 – 39% fail (1)

40 – 54% passable (2)

55 – 69% satisfactory (3)

70 – 84% good (4)

85 – 100% excellent (5)

KÖTELEZŐ IRODALOM / OBLIGATORY MATERIAL

Obligatory material:

S. Filizadeh: Electric machines and drives: principles, control, modeling, and simulation, 2017

AJÁNLOTT IRODALOM / RECOMMENDED MATERIAL