Course name	**ECE 32100 Electromechanical Motion Devices**
Credit and contact hours	(3 cr.) Class 3
Course coordinator's name	Euzeli dos Santos
Textbook	A.E. Fitzgerald, Charles Kingsley, Jr., and Stephen D. Umans, *Electric Machinery*, 7th Ed., McGraw-Hill Higher Education, 2013. ISBN: 9780073380469.
Course information	ECE 32100 Electromechanical Motion Devices (3 cr.) P: ECE 20200. C: ECE 31100. Class 3. The general theory of electromechanical motion devices relating to electric variables and electromagnetic forces. Revision of magnetic circuits and magnetic materials and principles of electromechanical energy conversion devices and rotating machines are introduced in this course. The basic concepts and operational behavior of synchronous, polyphase induction, DC, single- and two-phase machines are presented as well. **Prerequisites/ Co-Requisite** P: ECE 20200. C: ECE 31100 **Required, Elective, or Selected Elective:** EE Elective, CE Elective
Goals for the course	Upon successful completion of the course, students should be able to 1. Determine the lamped-parameters mathematical models of transducers and electromechanical motion. [1] 2. Derive the force and torques developed by the electromechanical motion devices. [1] 3. Determine the energy conversion and torque production for transducers and electric machines. Study DC and AC electric motors. [1, 6] 4. Apply the MATLAB software to model electromechanical motion devices. [1, 6, 1,2,6] 5. Analyze the electromechanical motion devices using the Park transformation and the inverse Park transformation. [1, 6, l] 6. Determine the applicability of different electric machines in servo-systems and electric drives applications. [1] 7. Develop models of electric machines and generators using the steady-state and dynamic equations of motion using MATLAB. [1, 2, 6]
List of topics to be covered	1. Magnetic Circuits and Magnetic Materials (3 classes) 2. Electromechanical-energy-conversion Devices (3 classes) 3. Introduction to Rotating Machines (4 classes) 4. Synchronous Machines (6 classes) 5. Polyphase Induction Machines (6 classes) 6. DC Machines (4 classes) 7. Single- and Two-phase Motors (4 classes)

Syllabi approved by	Euzeli dos Santos
Date of approval	10/22/2021