Catalog Course Description
Theory of transformers and rotating machines; harmonic and saturation effects on machine performance. Unbalanced operation and transient conditions.

Class Topics
1. Understand electrical circuit modeling
2. Determining torque and force in machines using energy and co-energy.
3. Understanding of saturation
4. Understanding of reluctance machines
5. Understanding of space harmonics in rotating machines
6. Understanding of synchronous, induction and DC machines
7. Variable frequency operation of induction and synchronous machines
8. Introductory understanding of machine dynamics
9. Understanding of the use of machines in a power system
10. Inverter operation and modeling
11. Adjustable speed and torque drives

Course Objective
The objective of this course is for senior-level students to learn advanced topics in electrical machinery and electromechanical energy conversion.

Course Lecturer
Jonathan Bird
Tel: 704-687-8595  Email: j.bird@uncc.edu
Office Hours: Wednesday 2-4pm (or just stop by)
Lecture Room: EPIC 2230
Lecture Time: Tuesday and Thursday, 3:30-4:45pm
Office: EPIC 2166

Teaching Assistant's Office Hours
No teaching assistant

Course Prerequisite
ECGR 3142 Electromagnetic Devices with a grade of C or better

Course Textbook

Suggested Reference Textbooks
Chapman S. J., Electric Machinery Fundamentals, 3rd Edition or later, McGraw-Hill

Grading
The final grade will be determined as follows:
Homework’s 30%
Experimental Project(s) 20%
Test 20%
Final Exam 30%