Ming Hsieh Department of Electrical Engineering

EE 599 – Electrical Machines – 3 units

Syllabus

Class Meetings: M 6:40-9:20 p.m. Room TBD

Instructor: Dr. Syed Ahmed email: siahmed@Central.UH.edu
Office Hours: Monday: 09:20-10:30 p.m..
(or by appointment)
Cellular No: (714) 299-3458

Teaching Assistant: TBD

Course Objectives: With the technological advances in High Temperature Superconductor (HTS) wire manufacturing, the fundamentals of electro-mechanical machinery design criteria is being revised. This course will give students a deep understanding of various aspects of machine behavior for further study of power systems, control systems, robotics, power semiconductor-controlled devices, machine design, or general industrial applications.

The course will present the fundamentals of electrmechanics, apply these to some of the configurations of electromechanical devices, their design and applications criteria and stimulate the student for further investigation of new and complex situations with exciting possibilities for advanced development of new types of devices using High Temperature Superconducting technology.

The course will also cover the principles of electromechanical energy conversion rotating machine design, transformer design, synchronous and induction motor design, direct-current machine design, their dynamics, and the latest in High Temperature Superconducting technology's applications in generator, motor, transformer, and under-ground cable design and their applications in All-Electric ships, air-planes, mag-lev trains, MRI's and other devices and systems

Prerequisite: EE 443 (for advisement purposes) – 599 pre-reqs. cannot be enforced

Text: TBD, IEEE Transactions/ Research Papers.

Grading: Midterm 40%, Final 40%, Homework 20%

Homework is due every Monday-06:45 P.M. at the beginning of class.
Late homework will not be accepted.

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Course Outline

Mon.	08-21	Introductions, Course Objectives & Overview – Special Topics
Mon.	08-28	Three-phase Voltages & Phase sequence, loads, Wye, Delta
Week of	09-05-8	(Make-up session that week TBD with class)
Mon.	09-11	The Magnetic Aspects – Electromagnetic field theory Transformers
Mon.	09-18	Principles of Electromechanical Energy Conversion- Rotating
Mon.	09-25	Machine windings
Mon.	10-02	Induction Machines
Mon.	**10-09**	**Midterm Examination**
Mon.	10-16	Synchronous Machines
Mon.	10-23	Direct-Current Machines – Commutator, Armature action
Mon.	10-30	Transient & Dynamics of AC machines – Special Machines
Mon.	11-06	HTS technology applications in Power Systems
Mon.	11-13	HTS technology applications in other industries
Mon.	11-20	HTS Generators, Motors, Transformers & Cables
Mon.	11-27	HTS applications in Trains, Planes, Space & Health Sciences
Mon.	12-04	Case Studies in HTS Applications in Power Systems
TBD	**TBD**	**Final Examination**

Statement on Academic Conduct and Support Systems

Academic Conduct:
Plagiarism – presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Part B, Section 11, "Behavior Violating University Standards" https://policy.usc.edu/scampus-part-b/. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, http://policy.usc.edu/scientific-misconduct.

Support Systems:
Student Counseling Services (SCS) - (213) 740-7711 – 24/7 on call
Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention. https://engemannshc.usc.edu/counseling/

National Suicide Prevention Lifeline - 1-800-273-8255
Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. http://www.suicidepreventionlifeline.org

Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-4900 - 24/7 on call
Free and confidential therapy services, workshops, and training for situations related to gender-based harm. https://engemannshc.usc.edu/rsvp/

Sexual Assault Resource Center
For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: http://sarc.usc.edu/

Office of Equity and Diversity (OED)/Title IX Compliance – (213) 740-5086
Works with faculty, staff, visitors, applicants, and students around issues of protected class. https://equity.usc.edu/

Bias Assessment Response and Support
Incidents of bias, hate crimes and microaggressions need to be reported allowing for appropriate investigation and response. https://studentaffairs.usc.edu/bias-assessment-response-support/

The Office of Disability Services and Programs
Provides certification for students with disabilities and helps arrange relevant accommodations. http://dsp.usc.edu

Student Support and Advocacy – (213) 821-4710
Assists students and families in resolving complex issues adversely affecting their success as a student EX: personal, financial, and academic. https://studentaffairs.usc.edu/ssa/

Diversity at USC
Information on events, programs and training, the Diversity Task Force (including representatives for each school), chronology, participation, and various resources for students. https://diversity.usc.edu/

USC Emergency Information
Provides safety and other updates, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible, http://emergency.usc.edu

USC Department of Public Safety – 213-740-4321 (UPC) and 323-442-1000 (HSC) for 24-hour emergency assistance or to report a crime.
Provides overall safety to USC community. http://dps.usc.edu