MAGNETOHYDRODYNAMICS

MECHANICAL ENGINEERING
4600: 696. 486 (SPECIAL TOPIC)
SPRING 2010

Class Sessions:
M/W 5:10 PM – 6.25 PM,
ASEC 304

Instructor:
Dr. Abhilash J. Chandy
Dept. of Mechanical Engineering, ASEC 114
Phone: 330-972-8676
Email: achandy@uakron.edu

Office Hours: Students are encouraged to contact me by email/phone to make appointments in office.

Reference Textbooks:
- The Electrodynamics of Fluids, Hughes, W.F. and Young, F.J., Kreiger Publishing

Grading:
- Projects 90 %
- Homework 10 %

Discussion among students about the projects/homeworks is accepted and encouraged; however, submitted work must be individual.

Academic Honesty: Cheating/Plagiarism in any way, shape, or form will be grounds for failure of the entire course. It is the policy of The University of Akron, as promulgated at University Rule 3359-42-01, that all University students refrain from the commission of plagiarism and from aiding or abetting another student in the commission of plagiarism.

Any student who feels she/he may need an accommodation based on the impact of a disability should contact the Office of Accessibility at 330-972-7928. The office is located in Simmons Hall, 105.

All homeworks are due at the end of the semester.
There will be FOUR projects due at specific dates during the semester. Depending on the project, there will be no lectures 1-3 classes before the project is due.

Project 1: Due Feb 8; No class on Feb 5 (20%)
Identify a technology that makes use of the concept of MHD, and conduct a literature review of the topic. Your literature review should provide a detailed description of the topic along with a background, i.e. what kind of experimental/theoretical/computational work has been done in this area. Your project report should be a maximum of 2 single-spaced pages, with 1-inch margins on all sides.

Project 2: Due March 8; No classes on March 1 and March 3 (20%)
Download the set of 1D and 2D MHD codes from http://www.cscamm.umd.edu/centpack/ and reproduce the results shown on the webpage. Your project report should provide the results that were generated using the codes along with some insights that you might have regarding the results. Your project report (including figures) should be a maximum of 2 single-spaced pages, with 1-inch margins on all sides.

Project 3: Due April 12; No class on April 7 (15%)
Identify a journal article from the Journal of Fluid Mechanics that deals with some fundamental aspect of MHD, that is to your interest and write a review on the paper. Basically explain in your own words what you understood about the paper and the topic in it. Your report should be a maximum of 1 single-spaced page, with 1-inch margins on all sides. Let me know by Feb 8, the citation of the article you have chosen.

Project 4: Due April 30; No classes on April 21, April 26, and April 28 (35%)
Perform a CFD computation of a physical problem that closely resembles the technology that you reviewed in Project 1. You can use any software. The parameters of the problem can also be arbitrarily fixed so as to illustrate the technology. Your project report should be a maximum of 4 single-spaced pages, with 1-inch margins on all sides.

PLEASE LET ME KNOW IF YOU HAVE ANY QUESTIONS/CONCERNS