MSE 5333
MSE 4390
Magnetic Properties of Materials

Description
The course will cover the origin of magnetism in materials, magnetostatics, magnetic domains and domain walls, magnetic anisotropies, magnetization processes, hard and soft magnetic materials. Applications of magnetic materials such as magnetic nanoparticles for bioapplications and magnetic data storage technology will be discussed. Also, several lab sessions will be included.

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Text Books:
Introduction to Magnetic Materials

Grading:
There will be several quizzes and one final exam. Questions in quizzes are from homework questions. The exam is comprehensive. The grades will be determined as follows:

Lab reports 60%
Final Exam 40%

Course Content: The topics listed below will be covered during this course.
Definition and units
Magnetostatics
Experimental methods
Diamagnetism and paramagnetism
Ferromagnetism
Ferrimagnetism
Antiferromagnetism
Magnetic anisotropy
Domains
Magnetization process
Fine particles
Thin films
Soft magnetic materials
Hard magnetic materials
Magnetic data storage technology
Magnetic Resonance Imaging (MRI)

Classroom Behavior

Students should NOT hold conversations.
Wireless communications devices MUST be silenced.

American with Disabilities Act

The University of Texas at Arlington is on record as being committed to both the spirit and letter of federal equal opportunity legislation; reference Public Law 93112 - The Rehabilitation Act of 1973 as amended. With the passage of new federal legislation entitled Americans with Disabilities Act (ADA), pursuant to section 504 of the Rehabilitation Act, there is renewed focus on providing this population with the same opportunities enjoyed by all citizens.

As a faculty member, I am required by law to provide “reasonable accommodation” to students with disabilities, so as not to discriminate on the basis of that disability. Student responsibility primarily rests with informing faculty at the beginning of the semester and in providing authorized documentation through designated administrative channels. If you require an accommodation based on disability, I would like to meet with you in the privacy of my office during the first week of the semester to make sure that you are properly accommodated.

Academic Dishonesty

It is the philosophy of the University of Texas at Arlington that academic dishonesty is a completely unacceptable mode of conduct and will not be tolerated in any form. All persons involved in academic dishonesty will be disciplined in accordance with University regulations and procedures. Discipline may include suspension or expulsion from the University.

“Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.” (Regents’ Rules and Regulations, Part One, Chapter VI, Section 3, Subsection 3.2, Subdivision 3.22)

In particular, it is expected that in the course of taking an examination, students will NOT (1) accept information of any kind from others; (2) use any material that is unauthorized by the examiner; (3) use aids to memory other than those expressly permitted by the
examiner. Following an examination, students will not try to deceive the instructor by misrepresenting or altering their previous work.

For homework, students can discuss questions with each other, but each student must write the answers in his/her own words.