

CHM 4714 Materials Chemistry – Spring 20XX

Meeting Time and Location: TR, 9:30-10:50 AM, GS 107

Course Instructor: Dr. Daniel T. de Lill, office: 561- 297-3819, email: ddelill@fau.edu

Office Hours: Tuesdays 11AM-1PM, SE 138 or by appointment. I have an open door policy; if my door is open even a crack and I am not busy with another individual, you may knock and ask if I have time to speak with you. If I do not, we will set up a better time.

Prerequisite: CHM 2210 (Organic Chemistry 1) and 3609 (Inorganic Chemistry), or permission of instructor. While note required, CHM 3411 (Physical Chemistry 2) would be useful.

Course Web-Site: Course materials and grades will be uploaded to <http://blackboard.fau.edu>.

Student Responsibilities: All students must read and understand the contents of this syllabus. It is the responsibility of the student to check their **FAU email addresses** on a **daily** basis and blackboard on a weekly basis. All communication in this course will be through blackboard and your FAU email addresses only!

Required Textbook: "Solid State Chemistry: An Introduction" by Lesley E. Smart and Elaine A. Moore, **3rd Edn**, 2005, CRC Press Taylor & Francis Group, ISBN: 0-203-61063-6. A simple scientific calculator is required (suggested: **Texas Instruments TI-30XA**). Graphing/programmable calculators will **NOT** be permitted during exams.

Course Description and Objectives: This 3 credit course serves as an introduction to solid state and materials chemistry. Students will be expected to have a detailed understanding of basic solid-state chemistry and how structure-property relationships are important in materials chemistry. Students will be prepared for advanced coursework and/or research in the field of materials chemistry by the end of the semester. While a focus will be on inorganic materials, purely organic and hybrid materials will be introduced, as well as the basic concepts of nanochemistry. Students will have a foundation in crystal structures and crystallography, synthetic strategies, physical methods of characterizing solids, bonding and properties (optical, electronic, conduction, magnetism) in solids, and nanomaterials.

1. Crystal Structures and Crystallography
2. Physical Methods for Characterizing Solids
3. Review of Basic Bonding (Valence Bond/Molecular Orbital)
4. Bonding in Solids
5. Electronic, Optical, and Magnetic Properties
6. Carbon Based Materials
7. Basic Preparative Methods
8. Introduction to Nanochemistry and Nanoscience

Course Outline:

Dates	Topic	Chapter
1/10	Introduction to Materials Chemistry	none
1/12, 17, 19, 24	Basic Crystal Structures and Crystallography	1
1/26, 31	Physical Methods (instrumentation)	2
2/2, 7	Defects and Non-Stoichiometry	5
2/9	Exam I	
2/14, 16	Preparative Methods	3
2/21	Basic Bonding Review	none
2/23, 28	Bonding in Solid State Compounds (Band Theory)	4
3/1	Solid State Electronics and Conduction	4
3/13, 15	Carbon-Based Electronics; Intro to Zeolites	6, 7
3/20	Exam II	
3/22, 27	Optical Properties of Solids	8
3/29, 4/3	Magnetic and Dielectric Properties	9
4/5	Superconductivity	10
4/10	Nanochemistry	11
4/12, 4/17, 19	Graduate Student Presentations	none
4/24	Exam III	
4/26	Final Exam, 7:45 AM – 10:15 AM	

Exams: There will be three exams plus one final exam for the course. All exam problems will be modeled after the lecture notes and consist of multiple-choice, short answers, and/or calculations. The final exam will be an analysis of a journal article as it pertains to this course. The student will read the article, answer a series of questions based on the article, and be asked to develop their own experimental procedures to augment the studies presented. It will be designed specifically to challenge the student and to have them critically think about the course material. There may be “pop quizzes” given at any point of lecture based on previous class’ lecture notes or the assigned chapter reading in preparation for class. These quizzes are for extra credit only and there are absolutely no make-up quizzes allowed.

If you miss an exam for an excused absence as outlined in FAU policy, read below: medical emergency/problem; death in immediate family; participation at an FAU-sponsored academic or athletic event; required appearance in a civil/criminal court; religious holiday. Written documentation is **required** with notification no later than **two days** after the exam. ***If you fail to notify the instructor with the supporting documentation in this given time frame or if you miss the exam for any other reason than those stipulated above, then you will receive a 0 on the exam.*** If the excuse is valid, then you may make up the exam. Make-up exams are not the same as those given in class and will be more difficult.

Course Grade: The course grade is based on the total points actually earned from the following assessment exercises:

Exam 1	= 100 points
Exam 2	= 100 points
Exam 3	= 100 points
Final	= 100 points
Total	= 400 points

The following percentages are the cut-off for letter grades. The +/- system will generally not be used in this course, but its use is left to the discretion of the instructor. These ranges may be lowered based on class performance, but will never be raised.

A = 90%

B = 80%

C = 70%

D = 60%

F = <60%

All grades will be calculated to two decimal places with no rounding up. Exams grades posted on blackboard are the adjusted exam grades (i.e., after the “curve.”) Since exams are “curved” each time, there will be no “final curve” at the end of the semester.

Code of Academic Integrity: Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the University mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the University community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see the Code of Academic Integrity in the University Regulations at: http://www.fau.edu/regulations/chapter4/4.001_Code_of_Academic_Integrity.pdf

Attendance Policy: Attendance will be taken with a sign-in sheet at random for record keeping purposes only. There is no positive or negative impact on your final grade in the course based on lecture attendance. However, you are urged to attend lecture as you may miss certain announcements, extra-credit quizzes, etc. Lecture notes will serve as your primary source of course information and all exams will be based on these notes. I augment lecture notes with material not presented in the text. If you miss class, you may be missing critical information.

ADA Statement: In compliance with the Americans with Disabilities Act (A.D.A.), students who require special accommodation due to a disability, to properly execute course work must register with the Office for Students with Disabilities (OSD) located in SU 133 (561-297-3880) and follow all OSD procedures.

Class Room Etiquette: You are expected to be in your seat and ready for lecture *before* class begins! You should have already done the textbook reading. We go through lectures quickly, so it is imperative that you read your text before class or you may quickly become lost. Please do **NOT** come to lecture late and **TURN OFF** all cell phones. These interruptions are inconsiderate and counterproductive to a learning environment. If you do not come to class fully prepared to focus only on the class material, then you should not come to class.