

COURSE TITLE BLACKBOARD SITE	CHM 6253 Materials and Their Uses Fall 2012 – http://my.ltu.edu and select CRN 1925
INSTRUCTOR	LaVetta Appleby Senior Lecturer Lawrence Tech University Contact Information lappleby@ltu.edu 248 204-3516 Office hours by appointment
SCHEDULE	September 11 – December 11, 2011 Refer to http://www.ltu.edu/registrars_office/calendar_final_exam.index.asp for the last date to withdraw and other important registration related information.
LEVEL/HOURS PREREQUISITE	Graduate Degree / 30-36 credit hours
REQUIRED TEXT (See Blackboard for additional resources)	Chemistry: An Introduction to General, Organic, and Biological Chemistry (10e) by Karen C. Timberlake, ISBN: Available for online purchase through LTU Bookstore at: http://lawrence-tech1.bkstore.com/bkstore/TextbookSelection.do?st=489
ADDITIONAL RESOURCES	LTU Online student resources: http://www.ltu.edu/ltuonline/
TECHNICAL SUPPORT	Technical support for using Blackboard is provided by the Helpdesk, 248.204.2330 or helpdesk@ltu.edu . Send the Help Desk a form detailing any issues by clicking here http://tinyurl.com/3yqrvne .

COURSE SCHEDULE FOR MET SEMESTER COURSES

This fully online course begins with a partial week online course orientation period to familiarize yourself with the online learning environment and to meet online or via the phone with your instructor. Each subsequent week starts on a Monday and ends on a Sunday.

Dates	Modules	Topics	Readings	Assignments Due
Prior to Semester Start and Sep 4 – Sep 10	Module 0	Overview of textbook Online Learning Orientation Course Orientation and group formation	Course orientation	Prior to Semester Start and Sep 11 – Sep 16
Sep 11 – Sep 16	Module 1	Metals Oxidation and Reduction Electrochemistry	Chap 3 pg. 92-93 Chap 5	Sep 16
Week of Sep 17 – Sep 23	Module 2	Organic Introduction <ul style="list-style-type: none"> Structure and nomenclature 	Chap 10 pages 350-373 and chap 11 pages 382-392	Sep 23
Week of Sep 24 – Sep 30	Module 3	Stereoisomers <ul style="list-style-type: none"> Drug Molecules Look in the Mirror Making Light Work Stereoisomers 	Chap 12, pages: 427-433	Sep 30
Week of Oct 1 – Oct 7	Module 4	Polymers <ul style="list-style-type: none"> Polymers Around Us Dirty Little Secret of Diapers 	Chap 11, pages: 393- 395	Oct 7
Week of Oct 8 – Oct 14	Module 5	Polymers <ul style="list-style-type: none"> Properties Making Polymers: Silly Polymer Recycling Polymers 	Chap 11, pages: 393- 395	Oct 14
Week of Oct 15 – Oct 21	Module 6	Polymer Presentation	Polymer Presentation Handout	Oct 21
Week of Oct 22 – Oct 28	Module 7	Carbohydrate Midterm 10/24/12	Chap 14, pages: 483-506	Oct 28
Week of Oct 29 – Nov 4	Module 8	Intro to Lipids <ul style="list-style-type: none"> Saturated and Unsaturated Fats and Oils 	Chap 15, pages: 513- 530	Nov 4
Week of Nov 5 – Nov 11	Module 9	Introduction: GrandMa's Soap <ul style="list-style-type: none"> Assessing Competing Products Making Soap Developing and Marketing a 	Chap 16	Nov 11

		Product		
Week of Nov 12 – Nov 18	Module 10	GrandMa's Soap (cont.) <ul style="list-style-type: none"> Soap Properties 	Chap 16 Soap Presentation Handout	Nov 18
Week of Nov 19 – Nov 25	Module 11	Proteins <ul style="list-style-type: none"> How to Turn an Egg White White Enzymes 	Chap 16	Nov 25
Week of Nov 26 – Dec 2	Module 12	Soap Presentations	Soap Presentation Rubric	Dec 2
Week of Dec 3– Dec 11	Module 13	Review and Final Exam		Dec 11

STUDENT EVALUATION

The course has 13 modules totaling 1189 points. Letter grades are awarded based on the total number of points achieved. Points are deducted for late assignments.

Assignments	Points
Lab/Activities	135
Presentations	405
Discussion Board	95
Homework	91
Mid-Term Exam	159
Final Exam	185

Class Points	Letter Grade
96 and above	A
90 – 95	A-
87 – 89	B+
83 – 86	B
80 – 82	B-
77 – 79	C+
73 – 76	C
70 – 72	C-
61 – 70	D (Undergrad Only)
60 and below	E

Note: Grades lower than a "B" fall below the LTU graduate standard

EDUCATIONAL GOALS

The goal of this course is to increase teachers understanding of why diverse materials have the properties they do based on the atomic model. The physical and chemical properties of different materials are examined by means of physical measurements and observations. Properties of metals, and naturally occurring and artificial polymers will be contrasted. A variety of polymer compositions, their many uses, and how they are recycled will be discussed. In life chemistry, medicinal compounds and their physiological effects, as well as, the chemical compositions of cells and living tissue will be discussed. In food chemistry, nutrition and the three major components of food other than water are considered, i.e., carbohydrates, proteins, and fats. The composition and structure of these three classes will be investigated. How each are synthesized and ultimately broken down will be discussed. The relationships between chemical concepts and scientific reasoning, research methods and practical applications will be illustrated during the teachers participation in solving a hypothetical industrial research problem.

Topics will be explored via hands-on investigations, written and oral presentations, experimental design projects, critiques of science articles, and journaling. Students will also develop and demonstrate proficiency in handling and disposal of chemicals. Content-specific learning will be assessed.

STUDENT LEARNING OBJECTIVES / OUTCOMES

Course standards/learner outcomes

This course includes these Standards for the Preparation of Teachers of Integrated Science from the Michigan state Board of Education August 8, 2002:

This course helps prepare teachers to:

- use the Michigan Curriculum Framework K-12 Science Content Standards and Benchmarks as the critical foundation for teacher preparation, ensuring that elementary and secondary integrated science teachers have the content knowledge and the ability to teach this curriculum; and
- develop an understanding of the interconnectedness of all science, along with major unifying themes, and relates this understanding to the teaching of science; and

The preparation of elementary and secondary integrated science teachers will enable them to:

Understand and develop the major concepts and principles of chemistry which may include such topics as the following:

Outline:

1. Introduction to Organic Chemistry
 - i. Organic compounds: naming and writing formulae
 - ii. Hydrocarbons
 - iii. Substituted hydrocarbons
2. Aliphatic and alicyclic reactions
3. Stereochemistry
4. Structure and nomenclature of major functional groups
5. Aromatic compounds
6. Spectroscopy
7. Heterocyclic compounds
8. Polymers
9. Biomolecules, including:
 - I. Lipids
 - II. Carbohydrates
 - III. Proteins

Course objectives:

The learner will:

- Classify organic compounds and represent them appropriately using line structures. This semester will review alkanes, alkenes, and alkynes, lipids, carbohydrates, and proteins.
- Use the rules of nomenclature to give correct names for organic compounds, draw correct structures that correspond to a name, and recognize common names.
- Use principles of stereochemistry to locate stereocenters and label stereoisomers, identify chiral compounds, give stereochemical relationships between molecules,
- Understand the chemical reactions for making soap.
- Understand the chemical mechanism for making polymers: condensation and addition.
- Give starting materials, reagents, and products for reactions of organic compounds.

PREREQUISITE SKILLS

None

INSTRUCTIONAL METHODS AND COURSE ORGANIZATION

Homework 30%

This consists of any written work you will be asked to complete outside of class. It may include papers, outside-of-class investigations, problem sets, text or video critiques, written and oral reports, etc. Homework assignments will be assigned points that approximately reflect their importance and difficulty. Assignments will normally be due the Tuesday after they are made, and will be assessed a 10% penalty for each day late.

Midterm Assessment 20%

This will be a general assessment of all materials introduced in the first half of this course. The format of this assessment will be discussed. You may have your course journal available during this assessment.

Authentic Assessment 30%

Teachers will engage in empirical investigations of the real world. This will include data collection in the laboratory and include all journal entries. Experimental investigations will involve constructing and reflecting on scientific knowledge. The data will be used to develop solutions to problems that are encountered or questions that are asked. Scientific knowledge will be constructed through collection of data and by interpreting text, graphs, tables, or pictures. Analyses performed will provide a basis for justification of personal knowledge or beliefs using either theoretically or empirically based arguments. Teachers will be asked to describe the limitations of their own knowledge and scientific knowledge in general and to describe the connection that exists among different areas of knowledge.

Final Assessment 20%

This will be a general assessment of all materials introduced in the latter half of this course. The format of this assessment will be discussed. You may have your course journal available during this assessment.

Blackboard Learning Environment – Blackboard at my.ltu.edu contains the syllabus, all assignments, reading materials, streaming videos, narrated PowerPoint mini-lectures, podcasts, written lecture notes, chapter quizzes, links to Web resources, and discussion forums. You will submit all assignments via Blackboard, and are expected to participate regularly in discussion topics. Please take time to familiarize yourself with the organization of the Blackboard site. You will want to check the site frequently for announcements reminding you of new resources and upcoming assignments.

Student/Instructor Conversations – Students keep in touch with the instructor via e-mail messages, telephone conference calls, and IM conversations.

Required Reading – Textbook chapters should be read according to the schedule outlined in the syllabus. Chapters will be discussed online.

CLASS POLICIES AND EXPECTATIONS

I plan to offer you a valuable learning experience, and expect us to work together to achieve this goal. Here are some general expectations regarding this course:

Each student has a LTU email account. If you wish to use a different email address for this course, please **change your email address in Blackboard under “Blackboard Tools”, then “Personal Information”** and send an email to me to store your email address in my email directory.

Readings, discussion forum participation, and written assignments must be completed according to the class schedule. It is important to contact the instructor as needed to discuss personal needs regarding course requirements and assignments.

It is essential that all students actively contribute to the course objectives through their experiences and working knowledge.

All assignments must be submitted on schedule, via Blackboard, and using Microsoft Office compatible software. If you need to submit an assignment via email, contact the instructor in advance.

Assignments must be completed to an adequate standard to obtain a passing grade. Requirements for each assignment are detailed in this syllabus.

Be prepared to log into Blackboard at least once each day. Please focus your online correspondence within the appropriate Blackboard discussion forums, so that your colleagues may learn from you.

At midterm and at the end of the course, you will be invited to participate in a University evaluation of this course. Your feedback is important to the University, to LTU Online, and to me as an instructor, and I strongly encourage your participation in the evaluation process.

It is important for you as students to know what to expect from me as your instructor:

- I will be available to you via e-mail and phone, and will promptly reply to your messages.
- I will be available to you for face-to-face appointments as requested.

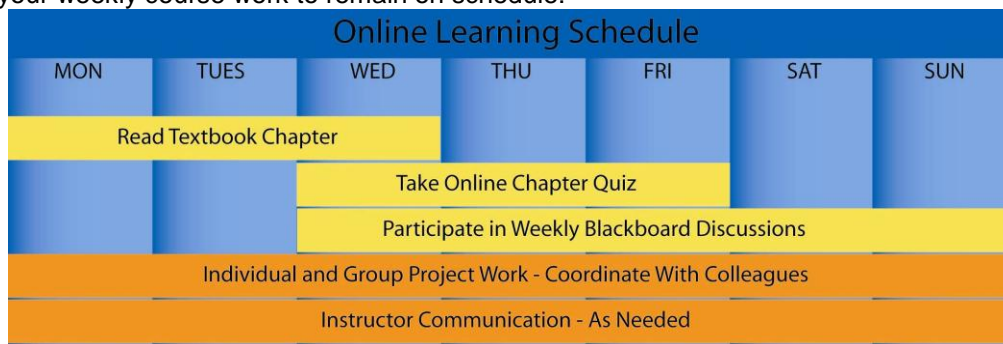
- I will maintain the Blackboard web site with current materials, and will resolve any content-related problems promptly as they are reported to me.
- I will send out a weekly e-mail update to all class members to guide upcoming work and remind you of assignment due dates.
- I will return all assignments to you promptly, and will include individualized comments and suggestions with each assignment.
- I will hold our personal written or verbal communications in confidence. I will not post any of your assignments for viewing by the class without requesting your approval in advance.
- I will treat all members of the class fairly, and will do my best to accommodate individual learning styles and special needs.
- If any of these points need clarification, or should special circumstances arise that require my assistance, please contact me so that we may discuss and resolve the matter.

PRACTICAL GUIDELINES FOR CLASS LOAD EXPECTATIONS

A three-credit course generally requires at least nine hours per week of time commitment. Here are some practical guidelines to help schedule your time commitments for this online course:

- A 14-week semester (the summer semester is compressed into 10 weeks) would require at least 126 hours of time commitment to successfully complete all readings, activities, assignments, and texts as described in this syllabus.
- You should reserve at least 6 hours per week to read the required textbook chapters and resources, participate in online discussions, review presentation materials, and work through lab/activities. This effort will total at least 84 hours over the course of the semester.
- You should organize your remaining time to roughly correspond with the point value of each major assignment. This means that you should plan to spend at least:
 - 8-9 hours preparing your case study review;
 - 24-40 hours working with your group on the three parts of your semester-long project;
 - 8-9 hours working on the various components of your reflective consolidation (final exam).

These guidelines may not reflect the actual amount of outside time that you – as a unique individual with your own learning style – will need to complete the course requirements. The number of hours each week will vary based on assignment due dates, so please plan ahead to insure that you schedule your academic, work, and personal time effectively. The following graphic may be used to guide you in planning your weekly course work to remain on schedule:



ASSIGNMENT DETAILS

Course assignments and evaluation criteria are detailed below. Please review these requirements carefully. See the section Academic Resources / Assessment Guidelines for information about assessment of written and oral presentations.

Details for all assignments are shown below. Please note that you should not submit any assignments to the Blackboard “Digital Drop Box.” All assignments are submitted using the Blackboard “Assignments” or “SafeAssign” function, except your MasterChemistry homework. Homework done in MasterChemistry will be completed and submitted at www.masterchemistry.com. Some assignments are also posted to the Blackboard Discussion Forum for student comments.

Modules (1189 Points)

Module 1: Oxidation Reduction of Metals

- Practice: View Redox reaction lab demo, complete the redox lab and complete lab questions (14pts)
Lab Demo: rtsp://www.ltuvitrc.com/acad/CHM3144/200610/1089_appleby_04.rm
- Practice: Complete Module 1 in MasteringChemistry homework. (10pts)
<http://session.masteringchemistry.com>; Course ID: MCAPPLEBY08590
- Practice: Complete Discussion Board Questions (10pts)
- Practice: Complete the reflective journal.(10pts)

Module 2: Introduction to Organic Chemistry

- Theory: Read chapter 10 pages 350-373 and chapter 11 pages 382-392.
- Theory: Complete discussion Board Questions Part 1 (10pts)
- Theory: Review “Introduction to Organic Chemistry” presentation.
- Practice: Complete “Modeling Activity Alkanes and Isomers” lab and complete lab questions (20pts)
- Practice Complete Module 2 in MasteringChemistry.(10pts)
(<http://session.masteringchemistry.com>; Course ID: MCAPPLEBY08590)
- Theory: Complete discussion Board Questions Part 2 (5pts)
- Practice: Complete the reflective journal. (10pts)

Module 3: Stereoisomers

- Theory: Read chapter 12, pages: 427-433 and the stereochemistry handout.
- Theory: Review “Stereochemistry” presentation.
- Practice: Complete “Stereochemistry Activity” lab and complete lab questions (13pts)
- Practice: Complete “Stereochemistry Homework Worksheet” (13pts)
- Practice: Complete discussion Board Question (5pts)
- Practice: Complete the reflective journal. (10pts)

Module 4: Introduction to Polymers

- Read chapter 11, pages: 393- 395.
- Review “Introduction to Polymers” presentation.
- Complete “Dirty Little Secret of Diapers” lab and complete lab questions (10pts)
- Complete module 4 homework in MasteringChemistry. (10pts)
<http://session.masteringchemistry.com>; Course ID: MCAPPLEBY08590
- Complete Discussion Board Questions (10pts)
- Complete the reflective journal. (10pts)
- View Polymer presentation handout.

Module 5: Polymer Properties

- Read chapter 11, pages: 393- 395.
- Theory: View “Polymer Properties” presentation.
- Practice: Complete “A Silly Polymer” lab and complete lab questions (10pts)
- Practice: Review web quest for recycling polymers:
<http://www.glencoe.com/sec/science/webquest/content/recycle.shtml>
- Practice: And complete the “Recycling Polymers” Homework Worksheet (15pts)
- Practice: Complete discussion Board Questions (10pts)
- Practice: Complete the reflective journal. (10pts)

Module 6: Polymer Presentation

- Theory: Read presentation handout and review presentation rubric
- Theory: Choose a polymer and notify your instructor by posting your choice in the Discussion Board. (10pts)
- Practice: Create PowerPoint presentation, upload it to Wimba and record it in Wimba. (240pts)
- Practice: Review and evaluate your classmates’ presentation and upload evaluations to your instructor in Assignments. (5pts)
- Practice: Complete the reflective journal. (10pts)

Module 7: Carbohydrates

- Read chapter 14, pages: 483-506.
- Review “Carbohydrates” presentation.
- Complete “Dehydration Synthesis” Explorelearning virtual lab and complete lab questions (18pts)
- Complete Midterm Exam (158pts)
- Complete the reflective journal. (10pts)

Module 8: Introduction to Lipids

- Read chapter 15, pages: 513- 530.
- Review “Lipids” presentation.
- Complete the “Saturated and Unsaturated Fats and Oils” lab and complete lab questions. (10pts)
- Complete the “Modeling Lipids” Homework using ChemPad 3. (15pts)
- Complete Discussion board question. (10pts)
- Complete the reflective journal. (10pts)

Module 9: Introduction to Grandma’s Soap

- Read chapter 13, pages: 459-461.
- Review “Grandma’s Soap Part 1” presentation.
- Complete Grandma’s Soap Activity 1(10pts) and questions
- Complete Grandma’s Soap Activity 2(10pts) and questions
- Course ID: MCAPPLEBY08590
- Complete Discussion Board questions. (10pts)
- Complete the reflective journal. (10pts)

Module 10: Soap Properties

- Read chapter 8, pages: 280-289, 292-293; chapter 13, page: 461.
- Review “Grandma’s Soap Part 2” presentation.
- Complete “The pH of Soap Activity” and questions. (10pts)
- Complete Grandma’s Soap Activity 3 – “Soap Presentation” Prep for Module 12
- Complete Module 10 in MasteringChemistry. <http://session.masteringchemistry.com>;
Course ID: MCAPPLEBY08590 (8pts)
- Complete Discussion Board questions. (10pts)
- Complete the reflective journal. (10pts)

Module 11: Proteins

1. Read chapter 16, pages: 552-579.
2. Review “Protein” presentation.
3. Complete “How to Turn An Egg White White” and complete the table. (10pts)
4. Complete Module 11 in MasteringChemistry. <http://session.masteringchemistry.com>;
Course ID: MCAPPLEBY08590 (10pts)

5. Complete Discussion Board questions.
6. Complete the reflective journal. (10pts)

Module 13: Final Review and Exam

1. Complete the final exam review sheet.
2. Post Discussion Board questions.
3. Complete your final exam.

Online Participation (95 points)

Each student is expected to actively participate in online activities. Class participation is evaluated to a maximum of 95 points based on:

Actively participating in Blackboard discussion forums, responding to questions posted by the instructor, and interacting positively with other students.

SYLLABUS ADDENDA

Please see the LTU Online “Current Students” web site <http://www.ltu.edu/ltuonline/> for comprehensive information about Lawrence Tech’s academic services, library services, student services, and academic integrity standards. The content of this web site is explicitly included in these syllabus requirements.

The LTU Online “Current Students” web site also includes grading rubrics used by your instructor to evaluate written assignments, discussion forum participation, and group assignments. Please note that the SafeAssign anti-plagiarism product will be used for written assignments submitted for this course. Please see the instructions included on the [eHelp web site](#) regarding the use of the SafeAssign product.

Undergraduates: Leadership Transcripts

The leadership transcript enables students to track co-curricular activities that are undertaken above and beyond the requirements of the LTU curriculum. The leadership transcript serves students by enhancing the leadership portfolio; providing the opportunity for a transcript of distinction; enhancing their resumes; and assisting in articulating leadership experience. It can be accessed by logging on to Banner Web and clicking the Student and Financial Aid tab. Leadership Activities is located at the bottom of the list. More information is available at <http://www.ltu.edu/leadership>.