CHM 105

General Organic and Biochemistry

Course Description
This course is a study of the fundamental principles of chemistry, including atomic and molecular structure, common substances and reactions, introduction to organic chemistry and biochemistry.

CHM 105 will transfer to the University of South Carolina – Beaufort (USCB) as a requirement in the Bachelor of Science Nursing program. However, if you are planning to transfer to another college or university, you will need to contact that institution to see if this course will transfer.

Prerequisites: MAT 102

4.0 Cr (3.0 lect/pres, 3.0 lab, 0 other)

Course Focus
This is a course in chemical principles including the structure of and energy associated with matter; quantitative kinetic and equilibrium analysis of chemical and physical processes. Inorganic and organic chemistry will be covered including the structure and function of biological macromolecules and metabolism. Chemical processes and concepts will be explored through their practical application in the technologies with an emphasis on laboratory techniques. Specifically designed for non-science majors.

Text and References

**CHM 105 CORE CURRICULUM COMPETENCIES**

All courses approved for the general education core curriculum help students develop communication skills and/or critical thinking. Students will demonstrate achievements by assessments on the departmental final exam and on testing developed by individual instructors. This course develops critical thinking skills through instruction that emphasizes the understanding of the scientific disciplines of general, organic and biological chemistry, as demonstrated in the following: a formal research paper requiring the student to develop, evaluate, and synthesize credible information on a given topic.

This research project allows the student to:
- Apply standard scientific methods and interpret laboratory observations and data;
- Make inferences justified by data and observations;
- Explain relevance of findings to chemical principles, or expected results;
- Identify key assumptions of chemical science.

Periodic exams, homework and a standardized final examination also tests critical thinking ability.

**Course Goals**

The following list of course goals will be addressed in the course. These goals are directly related to the performance objectives. (*designates a CRUCIAL goal)

1. Justify chemistry study
2. List metric units
3. Make accurate and precise measurements *
4. Use significant digits
5. Convert measurements
6. Characterize matter phases
7. Trace atomic history
8. Draw atoms
9. Distinguish chemical bonds
10. Identify chemical properties
11. Apply inorganic nomenclature *
12. Write chemical formulas *
13. Calculate atomic weight
14. Balance chemical equations
15. Predict chemical reaction outcomes
16. Construct empirical and molecular formulas
17. Characterize redox reactions
18. Use chemical mole
19. Link mole concept with molecular mass
20. Quantify reaction and product amounts
21. Calculate using limiting reactant
22. Discuss water chemistry
23. Identify reaction types
24. Construct ionic equations *
25. Apply stoichiometry to aqueous calculations
26. Define state function *
27. Trace reaction energy
28. Identify energy changes
29. Measure heat changes
30. Relate enthalpy and internal energy
31. Calculate change in enthalpy *
32. State thermodynamic laws
33. Characterize light
34. Define photon
35. Draw electron arrangements
36. Relate periodic table organization
37. Define periodicity
38. Examine periodic trends *
39. Predict ion sizes
40. Apply octet rule
41. Draw Lewis structures
42. Assign formal charges
43. Identify resonance structures *
44. Predict molecular shapes
45. List octet exceptions
46. State molecular orbital theory *
47. State quantum theory
48. Recognize hybrid orbitals
49. Apply ideal gas law *
50. Address non ideal gas behavior
51. State kinetic molecular theory
52. Examine intermolecular forces
53. Predict salt solubility
54. Construct phase change diagram
55. Express solution concentration
56. Recognize chemical equilibrium *
57. Distinguish reaction rates *
58. Use equilibrium constants *
59. Calculate pH
60. Link auto ionization to pH
61. Perform acid base titration
62. Define nuclear radiation
63. Define radioactive half-life
64. Identify nuclear radiation types
65. Predict nuclear decay results

Student Contributions:
Classes are designed to employ a variety of teaching techniques. In order to maximize learning, required readings should be done prior to a unit. If a student is falling behind in lab performance or academic achievement, it is imperative to seek immediate assistance from the instructors.
Course Evaluation

- Student progress will be evaluated through a series of tests, quizzes in-class and out of class assignments and will be detailed in the attachment to this syllabus.
- Blackboard: lecture notes, handouts, podcasts, study hints, tutor information, syllabi, and other course information is available on the course blackboard page.
- Laboratory Component: This course has a required lab component which supplements the information presented in lecture. The lab will be independently evaluated primarily through lab practicals, in class and out of class lab assignments (such as research papers). For specific details about lab evaluations, please refer to the attachment to this syllabus.

TCL GRADING SCALE:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90-100</td>
</tr>
<tr>
<td>B</td>
<td>80-89</td>
</tr>
<tr>
<td>C</td>
<td>70-79</td>
</tr>
<tr>
<td>D</td>
<td>60-69</td>
</tr>
<tr>
<td>F</td>
<td>Below 60</td>
</tr>
</tbody>
</table>

Course Schedule

Students must attend 2.5 lecture hours per week, 3.0 lab hours per week and plan online time of 0.5 hours per week.

ADA STATEMENT

The Technical College of the Lowcountry provides access, equal opportunity and reasonable accommodation in its services, programs, activities, education and employment for individuals with disabilities. To request disability accommodation, contact the counselor for students with disabilities at (843) 525-8228 during the first ten business days of the academic term.

ACADEMIC MISCONDUCT

There is no tolerance at TCL for academic dishonesty and misconduct. The College expects all students to conduct themselves with dignity and to maintain high standards of responsible citizenship.

It is the student’s responsibility to address any questions regarding what might constitute academic misconduct to the course instructor for further clarification.

The College adheres to the Student Code for the South Carolina Technical College System. Copies of the Student Code and Grievance Procedure are provided in the TCL Student Handbook, the Division Office, and the Learning Resources Center.

ATTENDANCE

The College’s statement of policy indicates that students must attend ninety percent of total class hours or they will be in violation of the attendance policy.

- Students not physically attending class during the first ten calendar days from the start of the semester must be dropped from the class for NOT ATTENDING.
- Students taking an online/internet class must sign in and communicate with the instructor within the first ten calendar days from the start of the semester to indicate attendance in the
class. Students not attending class during the first ten calendar days from the start of the semester must be dropped from the class for NOT ATTENDING.

- Reinstatement requires the signature of the division dean.
- In the event it becomes necessary for a student to withdraw from the course OR if a student stops attending class, it is the student’s responsibility to initiate and complete the necessary paperwork. Withdrawing from class may have consequences associated with financial aid and time to completion.
- When a student exceeds the allowed absences; the student is in violation of the attendance policy. The instructor MUST withdrawal the student with a grade of “W”, “WP”, or “WF” depending on the date the student exceeded the allowed absences and the student’s progress up to the last date of attendance or
- Under extenuating circumstances and at the discretion of the faculty member teaching the class, allow the student to continue in the class and make-up the work. This exception must be documented at the time the allowed absences are exceeded.
- Absences are counted from the first day of class. There are no "excused" absences. All absences are counted, regardless of the reason for the absence.
- A student must take the final exam or be excused from the final exam in order to earn a non-withdrawal grade.
- A copy of TCL’s STATEMENT OF POLICY NUMBER: 3-1-307 CLASS ATTENDANCE (WITHDRAWAL) is on file in the Division Office and in the Learning Resources Center.

HAZARDOUS WEATHER
In case weather conditions are so severe that operation of the College may clearly pose a hardship on students and staff traveling to the College, notification of closing will be made through the following radio and television stations: WYKZ 98.7, WGCO 98.3, WGZO 103.1, WFXH 106.1, WWVV 106.9, WLOW 107.9, WGZR 104.9, WFXH 1130 AM, WLVH 101.1, WSOK 1230 AM, WAEV 97.3, WTOC TV, WTGS TV, WJWJ TV, and WSAV TV. Students, faculty and staff are highly encouraged to opt in to the Emergency Text Message Alert System. www.tcl.edu/textalert.asp

EMERGENCY TEXT MESSAGE ALERT
Students, faculty and staff are highly encouraged to opt in to the Emergency Text Message Alert System. Participants receive immediate notification of emergency events and weather cancelations via text messaging on their cell phones. Participants can also opt in to receive non-emergency news and announcements. Go to www.tcl.edu. On the homepage, click on “emergency TextAlert at TCL” and fill out the form or go to www.tcl.edu/textalert.asp

GRADING METHODOLOGY
The final grade must be 70 or more (a grade “C” or better) in order to pass the course and progress to the next course. Students absent from an examination or presentation will receive a “0” grade for the examination unless other arrangements are made with the individual instructor prior to the examination or presentation day or on the examination or presentation day before the test/presentation is scheduled to be given.

The student is responsible for notifying the instructor for the reason of the absence. It is also the responsibility of the student to contact the appropriate instructor to arrange to make up the examination. Arrangements may be completed by telephone.
If the instructor is not available, a message should be left on the instructor’s voice mail AND with another member of the faculty or administrative assistant. The make-up exam will be scheduled and the instructor will decide the method of examination. Messages sent by other students are unacceptable.