

**SOUTHERN CONNECTICUT STATE UNIVERSITY**

**Course Number and Title**    CHE 301 Preparation of Scientific Documents  
**Fall 20xx**

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**COURSE NUMBER**    301            **CREDIT HOURS:**    1            **PREREQUISITES:** CHE120/121

**COURSE TITLE:** Preparation of Scientific Documents for Chemistry

**COURSE DESCRIPTION:**

Expected Student Learning Activity	Weekly Hours for Course*	Total Hours for Course (7 week semester)	Term Credits Earned
Lecture time (Contact Hours)	2	14	
Reading and Study Time	2	14	
Assignments	2	14	
Examination		5 (Final Exam)	
<b>Total Hours</b>	<b>6</b>	<b>47</b>	<b>1</b>

\* Please note that these times are only estimates based on the Department of Education's definition of a credit hour and do not guarantee a specific grade in the course. Students may find that they require more or less time to succeed in the course.

The course will focus on the organization of scientific reports including styles commensurate with the American Chemical Society, Royal Society of Chemistry and additional journal publications, as well as the use of software programs designed specifically for the field of chemistry in the preparation of scientific documents. This includes but is not limited to, ChemDraw, Microsoft Word, Excel and the manipulation of materials between these software programs. This is part of an ongoing revision in the Chemistry department that has begun with the revised outline for the preparation of scientific documents in the General Chemistry sequence. The content of CHE 301 will expand on this knowledge by incorporating an advanced level of teaching commensurate with training for majors as opposed to the general science based student body for which field specific styles may vary. The course content will address basic writing skills and application of these skills to actual writing styles of scientific journal articles through a variety of assignments aimed at progressively enhancing skills. An emphasis will also be placed on the generation of appropriate documents utilizing many of the special features of the software described above.

**COURSE'S CONTRIBUTION:**

This is the first course in a sequence of 1 credit courses that have been developed to address issues concerning the written and oral abilities of graduating students as well as the safety issues surrounding the field of chemistry and proper use of chemicals that present hazards. This course also serves as the first course in the Tier III LEP sequence for chemistry majors.

**LEARNER OUTCOMES & ASSESSMENT**

Students enrolled in this course are expected to learn how to utilize the software programs necessary to prepare scientific reports for courses, publication, etc. in a professional manner. This includes training with the various software programs and demonstrating their proficiency on assignments. Specific objectives are listed below:

- Learn what it means to plagiarize work and how to avoid this. Students will read the policy on plagiarism and summarize sections as requested on assignments. Students will learn the proper manner to cite literature sources and paraphrase in an accepted fashion. (INTASC 6, 9; NSTA 2, 10; LEP 1, 2, 3)
- Learn proper referencing styles commensurate with the American Chemical Society (ACS) guidelines and additional journal guidelines associated with the Royal Society of Chemistry (RSC) and the Chemical Institute of Chemistry (CIC). Students will be expected to write and/or correct citations for the specific style formats required by each of the publishing bodies. (INTASC 1, 4, 6; NSTA 3, 10; LEP 1, 2)
- Learn how to use the library resources available for searching the chemical literature. Students will demonstrate the knowledge by using the online resources to find the requested information related to availability of journals, books, and reference materials. Students will also use the resources to find examples of journal articles and notice to authors for selected journals in the field of study. (INTASC 4, 6; NSTA 1, 3, 4, 5, 6, 10; LEP 3)
- Learn how to report scientific data by accepted professional standards for spectroscopic interpretation of data including NMR (Nuclear Magnetic Resonance) and IR (Infrared) spectroscopy. Students will apply the knowledge learned by summarizing assigned spectral data or simulated data in ChemDraw according to the specific style guidelines for the American Chemical Society. (INTASC 1, 4, 6; NSTA 1, 4, 10; LEP 1, 2, 3)
- Learn how to use style sheets, set up toolbars, and other formatting techniques (Track Changes) using MS Word. This includes but is not limited to writing proper chemical formulas in reports, formatting and importing tables of data, spell checking, grammar checking, and utilizing special characters pertinent to the study of chemistry. Students will demonstrate the knowledge on assignments and exams by writing or correcting various examples of formatting using the parameters of the Word program. Demonstration of the ability to use formatting preferences, document styles, and programs such as equation editor and track changes will be required on assignments and examinations. (INTASC 1, 4, 6; NSTA 5, 10; LEP 1, 2)
- Learn the use of Excel software for the presentation of data in graphical formats suitable for interpretation of data. Students will be expected to prepare graphs of data using the software and to demonstrate this aspect of technical proficiency in materials generated for assignments. (INTASC 1, 4, 6; NSTA 5, 10; LEP 2)
- Learn how to import the data from Excel into other software programs. Various portions of the assigned work will require moving materials between the various programs utilized. (INTASC 1, 4, 6; NSTA 5, 10; LEP 2)
- Learn how to use drawing software specific to the discipline (ChemDraw) in the preparation of professional reports. This includes but is not limited to setting drawing and caption preferences, utilizing toolbars and rulers to prepare drawings suitable for importing into other programs such as MS Word, utilizing templates, formatting drawings for consistency and appearance. Students will be asked to reproduce a variety of figures, mechanisms, and catalytic cycles in a clean, well-aligned professional quality presentation using specific preferences. (INTASC 1, 4, 6; NSTA 5, 10; LEP 1, 2)
- Learn how to write scientific documents in a professional fashion in terms of content and overall presentation quality. The overall goal is to have students demonstrate the ability to draw on experiences in the course to prepare reports that are written using all aspects of style and preparation of figures to develop superior report writing skills. Students are expected to transfer these skills to all report writing throughout the remainder of their undergraduate degree program. (INTASC 1, 4, 6; NSTA 5, 10; LEP 1, 2, 3)

#### **MODES OF LEARNING**

Lectures, demonstrations, hands-on computing with programs, online use of resources.

#### **CELL PHONE POLICY**

Cell phones are not permitted in lecture. They must be turned off prior to entering the lecture. Failure to do so will result in the student being asked to leave the lecture! No exceptions.

#### **COURSE CONTENT OUTLINE**

Week 1: Discussion on plagiarism. Review of basic report writing formats. Discussion of different journal styles including accepted citation styles for journals, books, and proceedings of conferences using the ACS style guide. Comparison between journal and laboratory report styles. (LEP 1, 2, 3)

Week 2: Demonstration of the online resources and bound resources at Buley Library. Selected aspects of the ACS style guide including but not limited to the use of abbreviations, Latin terminology, capitals, tricky plurals, use of tables, schemes, and figures. (LEP 1, 3)

Week 3: Using Microsoft Word software. Demonstrations of the various tools in the program including defining style sheets, formatting documents, formatting characters, setting up toolbars, inserting and formatting tables of data, using spelling and grammar tools. (LEP 1, 2)

Week 4: Using Microsoft Word software continued. Demonstrations including the use of special characters, using the equation editor program, reporting spectroscopic data in laboratory reports. Using Excel software. Demonstrations of spreadsheet formatting, entering formulas, setting styles, and using graphing tools. (LEP 1, 2)

Week 5: Introduction to ChemDraw software programming. Demonstrations of how to set drawing and text preferences, drawing chemical structures using the various tools and templates, formatting files, drawing advanced chemical structures. (LEP 2)

Week 6: Using ChemDraw software. Discussion of the previous assignment. Practice using ChemDraw software replicating worksheet materials. Additional tools available in ChemDraw such as using the NMR calculators and 3D functions. (LEP 2)

Week 7: Using ChemDraw software continued. Advanced drawing techniques. Preparation of reaction schemes such as organic reaction mechanisms, catalytic cycles, and chemical reactivity summaries. Importing ChemDraw files into MS Word. Putting it all together (data summary styles revisited). Assigning actual spectra (NMR, IR) and GCMS printouts, and writing proper summaries according to ACS style guidelines. (1, 2)

Week 8: Final examination due.

### REQUIRED TEXTS

*The ACS Style Guide: Effective Communication of Scientific Information; 3<sup>rd</sup> Edition*; Coghill, A. M., Garson, L. R., Eds.; Oxford University Press: New York, 2006. (ISBN: 0841239991)

**It is strongly recommended that you keep the text until graduation as future lab reports/theses/etc. will require adherence to ACS style guidelines.**

### COURSE REQUIREMENTS

**Late/Missed Work:** Late assignments/exams will not be accepted for grading unless accompanied by a doctor's note.

**Attendance:** Regular and prompt attendance of scheduled classes is necessary for the student to derive the intended benefit of the hands-on learning experience. **Attendance is mandatory!** Students should arrive 10 minutes early to sign out a computer and login. There will be several demonstrations throughout the lectures that are important for the optimization of student academic progress. Since this course runs for half of the semester, each absence will result in a lowering of the final grade by 10%.

### EVALUATION CRITERIA

Student evaluations will be determined on the basis of assignments (70%) and a final examination (30%, take-home). Attendance is mandatory and absences will result in the lowering of the final grade as noted below. The assignments will involve a series of exercises using the computer programs discussed in class in conjunction with laboratory reports, spectroscopic data, sample data, and journal articles obtained through on-line services. The final examination will be cumulative and require using all of the programs discussed in lecture to complete additional exercises. Specialized software is available in JE 306 and students need to schedule their time to

accommodate the available times the room is open for access outside of the lecture. Students will also need to access their MySCSU accounts/email accounts to retrieve documents used in class.

- Assignment #1: LEP 1, 2, 3  
 Assignment #2: LEP 1, 2  
 Assignment #3: LEP 2  
 Final Exam: LEP 1, 2, 3

The following final grade scale will be used:

- A+ = 96 - 100%  
 A = 91 - 95%  
 A- = 86 - 90%  
 B+ = 82 - 85%  
 B = 78 - 81%  
 B- = 74 - 77%  
 C+ = 70 - 73%  
 C = 66 - 69%  
 C- = 62 - 65%  
 D+ = 58 - 61%  
 D = 54 - 57%  
 D- = 50 - 53%  
 F = ≤ 49

The instructor reserves the right to adjust the grading scales for class average at the end of the semester.

**STANDARDS GUIDELINES**

<b>INTASC [Interstate New Teachers' Assessment &amp; Support Consortium]</b>	<b>Professional Standards</b>	<b>LEP Advanced Tier I or II Requirements</b>
<p><b>Scholarship</b></p> <ol style="list-style-type: none"> <li>1. Knowledge of subject matter</li> <li>2. Knowledge of human development &amp; learning</li> <li>3. Instruction adapted to meet diverse learners</li> <li>4. Use of multiple instructional strategies &amp; resources</li> </ol> <p><b>Attitudes and Disposition</b></p> <ol style="list-style-type: none"> <li>5. Effective learning environment created</li> <li>6. Effective communication</li> <li>7. Lesson planning</li> </ol> <p><b>Integrity</b></p> <ol style="list-style-type: none"> <li>9. Reflection and professional development</li> </ol> <p><b>Leadership</b></p> <ol style="list-style-type: none"> <li>8. Assessment of student learning to</li> </ol>	<p><b>National Science Teacher's Association</b></p> <ol style="list-style-type: none"> <li>1. Content - Structure and interpret the concepts, ideas and relationships in science</li> <li>2. Nature of Science - Define the values, beliefs and assumptions inherent to the creation of scientific knowledge within the scientific community</li> <li>3. Inquiry - Formulating solvable problems, constructing knowledge from data, exchanging information for seeking solutions, developing relationships from empirical data</li> <li>4. Context of Science - Relate science to daily life: technological, personal, social and cultural values.</li> <li>5. Skills of Teaching - Science teaching actions, strategies and methodologies, interaction with students, effective organization and use of technology.</li> <li>6. Curriculum - Extended framework of goals, plans, materials and resources for instruction.</li> <li>7. Social Context - Social and community support network, relationship of science to needs and values of the community, involvement of people in the teaching of science.</li> <li>8. Assessment - Alignment of goals, instruction and outcomes, evaluation of student learning.</li> <li>9. Environment for Learning - Physical spaces for learning, psychological and social environment, safety in science</li> </ol>	<ol style="list-style-type: none"> <li>1. Written communication</li> <li>2. Technological fluency</li> <li>3. Information literacy</li> </ol>

<p>improve teaching</p> <p><b>Service</b></p> <p>10. Partnership with school and community</p>	<p>instruction.</p> <p><b>10.</b> Professional Practice - Knowledge and participation in the professional community, ethical behavior, high quality of science instruction, working with new colleagues as they enter the profession.</p>	
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**TENTATIVE COURSE CALENDAR**  
See "Course Content Outline" above.

**Accommodating Students With Disabilities:** Southern Connecticut State University provides reasonable accommodations in accordance with the Americans with Disabilities Act and Section 504 of the Rehabilitation Act, for students with documented disabilities on an individualized basis. If you are a student with a documented disability, the University’s Disability Resource Center (DRC) can work with you to determine appropriate accommodations. Before you receive accommodations in this class, you will need to make an appointment with the Disability Resource Center located at EN C-105A. To discuss your approved accommodations with me or other concerns, such as medical emergencies or arrangements in case the building must be evacuated, please make an appointment to meet as soon as possible. My office location and hours are listed at the beginning of this document.

**Inclement Weather:** When inclement weather threatens, call the university’s WeatherChek voice mail message line (203-392-SNOW) to hear the latest official information on possible delayed openings, class cancellations, or the closing of the university.

**Academic Dishonesty:** Unfortunately, the question of academic dishonesty occasionally becomes an issue between an instructor and a student. The best way to avoid this is to be sure that no suspicion arises. **Copying assignments or any other portion of this course will not be tolerated. The student handbook outlines the various prerogatives of the instructor in cases of academic dishonesty. In this course many submissions are made online via email. Unfortunately in the past students have tried to submit the same files for assignments/exams etc and everyone must now pay the price. If I catch any student copying any part of an assignment or exam, both (or all) students involved will receive an immediate grade of F for this course. There are no exceptions.**

**Additional Thoughts:** The student should read the appropriate text sections prior to attending class since lectures will cover the material at a reasonably rapid pace. The student will be expected to adapt to this pace. Attempting related problems prior to class is also strongly suggested. If you encounter difficulties when problem solving it often helps to return to the pertinent section in the text and review the material and sample problems. If you are still encountering difficulty with a particular problem don’t get frustrated or spend excessive time on that problem. Please come talk to the professor and we can review the problem(s) together. Alternatively you can use the online resources for that accompany the text to test your problem solving skills.

Your grade will not be based upon any claimed “need” which you may have. If you “need” a B in this course in order to gain admission into some program or transfer the course credit, then it is incumbent upon you, the student, to perform at the level that will fulfill the specific “need.” It is not the professor’s role to alter his or her evaluations of your work so as to take your “needs” into account.

There is no provision in this course to do work for “extra credit.” It stands to reason that if a person is not performing adequately in the assigned tasks of a course, there is no point in giving that person “extra” work. Requests to do work for “extra credit” will not be honored.

**Additional Resources:**

1. Selected journal articles from within the discipline including:

- (i) Journal of the American Chemical Society (ACS)
- (ii) Inorganic Chemistry (ACS)
- (iii) Chemical Reviews (ACS)
- (iv) Chemical Communications (RSC)
- (v) Journal of the Chemical Society, Dalton Transactions (RSC)
- (vi) Canadian Journal of Chemistry (CIC)

2. This course will involve the use of a variety of software programs that are available through the use of on campus computing facilities. The ChemDraw software is available in the Chemistry Department Computer Room (JE 306) at posted times outside scheduled lectures.