

**SOUTHERN CONNECTICUT STATE UNIVERSITY**

**Course Number and Title CHE 301 The Preparation of Scientific Documents for Chemistry  
Spring 2006**

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**Office Hours: Vary by semester – see instructor**

**COURSE NUMBER CHE 301      CREDIT HOURS: 1      PREREQUISITES: Sophomore standing**

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

**COURSE DESCRIPTION:**

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:**

CHE 301 has been designed to provide instruction in the development of literature researching skills and computer-based report preparation skills required for upper level courses and professional quality report writing in the field of chemistry. This one credit course is a required course taken in conjunction with Chemical Seminar (CHE 496), and Chemical Hazards and Laboratory Safety (CHE 445) to complete three credits of the upper level chemistry curriculum for all chemistry majors. Training will provide students with exposure and hands-on experience utilizing current software programs specific to the objectives of the course (as noted in the course description).

**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:

1. Learn what it means to plagiarize work and how to avoid this. (INTASC 1, 3, 6, 9 ; NSTA 2, 4, 5, 10 ; CCCT 1.3, 2.5)
2. 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). (INTASC 1, 4, 6 ; NSTA 4, 5, 10 ; CCCT 1.3, 1.4, 2.4)
3. Learn how to use the library resources available for searching the chemical literature. (INTASC 1, 4, 6, 9 ;

NSTA 3, 4, 5, 10 ; CCCT 1.2, 1.4, 1.6, 2.1, 2.6, 3.4)

4. Learn how to report scientific data by accepted professional standards for spectroscopic interpretation of data including NMR (Nuclear Magnetic Resonance) and IR (Infrared) spectroscopy. (INTASC 1, 4, 6 ; NSTA 1, 3, 10 ; CCCT 1.3, 1.6, 2.5, 3.4)
5. 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. (INTASC1, 4; NSTA 3, 6, 10 ; CCCT 1.2, 1.3, 1.4, 1.6, 2.4, 2.6)
6. Learn the use of Excel software for the presentation of data in graphical formats suitable for interpretation of data. (INTASC1, 4; NSTA 3, 6, 10 ; CCCT 1.2, 1.3, 1.4, 1.6, 2.4, 2.6)
7. Learn how to import the data from Excel into other software programs. (INTASC1, 4; NSTA 3, 6, 10 ; CCCT 1.2, 1.3, 1.4, 1.6, 2.4, 2.6)
8. 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. (INTASC1, 4; NSTA 3, 6, 10 ; CCCT 1.2, 1.3, 1.4, 1.6, 2.4, 2.6)
9. Learn how to write scientific documents in a professional fashion in terms of content and overall presentation quality. (INTASC 1, 3, 4, 6, 9 ; NSTA 1, 2, 4, 5, 6, 10 ; CCCT 1.1, 1.2, 1.3, 1.4, 1.6, 2.2, 2.4, 2.6, 3.4, 3.5)

The assessment of the learner outcomes will be derived from a series of weekly assignments aimed at testing the ability to demonstrate through a variety of tasks, the ability to use the programs to prepare high quality documents and reports. The final examination will involve the compilation of the skills developed throughout the semester in the generation of an assigned research report demonstrating the key specific styles for writing in the field of chemistry. The discussion of the weekly assignments will provide a basis for reiteration of key points that require further description such that each student will be able to progress in the ability on a regular basis.

### **MODES OF LEARNING**

Students will participate in lectures, classroom discussions of assigned work, and work along on an individual computer with the instructor during the scheduled lecture periods. The computer-based portions of the course will involve demonstrations of the various computer programs in real time by the instructor, with the students following along and developing skills at the same time.

### **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.

Week 2: A session will be scheduled for a demonstration of the online resources at Buley Library. Guest lecturer: Chemistry Librarian – Rebecca Hedreen

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. Discussion of the previous weekly assignment.

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. Discussion of the previous weekly assignment.

Week 5: Using Excel software. Demonstrations of spreadsheet formatting, entering formulas, setting styles, and using graphing tools. Discussion of the previous weekly assignment.

Week 6: Using ChemDraw software. Demonstrations of how to set drawing and text preferences, drawing chemical structures using the various tools and templates, formatting files, drawing advanced chemical structures. Discussion of the previous weekly assignment.

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. Using the NMR calculators and 3D functions.

Week 8: Final examination due.

## REQUIRED TEXTS

Dodd, J. C. *The American Chemical Society Style Guide*; ACS Press: Boca Raton, 1997. (ISBN: 0841234620)

## COURSE REQUIREMENTS

Students must have access to their MySCSU passwords and login information to enable the use of the computers provided for the course. Students must attend all lectures and participate in classroom discussions. Students must demonstrate a proficiency in the use of the computer programs studied and be able to apply this knowledge to various aspects of the styles of scientific writing. Weekly assignments and discussion of the assigned work are key components of the learning process for this course and all assigned work must be completed by the timeline noted to receive credit.

## EVALUATION CRITERIA

Student evaluations will be determined on the basis of weekly 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 weekly 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 involve writing a scientific report incorporating the use of the scientific software, referencing styles, and content commensurate with journal quality publications.

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 =  $\leq$  49

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

<b>STANDARDS GUIDELINES</b>		
<p style="text-align: center;"><b>INTASC [Interstate New Teachers' Assessment &amp; Support Consortium]</b></p> <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 improve teaching</li> </ol> <p><b>Service</b></p> <ol style="list-style-type: none"> <li>10. Partnership with school and community</li> </ol>	<p style="text-align: center;"><b>CEC STANDARDS</b></p> <p style="text-align: center;"><b>Individualized General Curriculum Referenced Standards</b></p> <ol style="list-style-type: none"> <li><b>1. Philosophical, Historical, and Legal Foundations of Special Education</b></li> <li><b>2. Characteristics of Learners</b></li> <li><b>3. Assessment, Diagnosis, &amp; Evaluation</b></li> <li><b>4. Instructional Content &amp; Practice</b></li> <li><b>5. Planning and Managing the Teaching and Learning Environment</b></li> <li><b>6. Managing Student Behavior and Social Interaction Skills</b></li> <li><b>7. Communication and Collaborative Partnerships</b></li> <li><b>8. Professionalism and Ethical Practices</b></li> </ol>	<p style="text-align: center;"><b>CCCT {CONNECTICUT COMMON CORE OF TEACHING}</b></p> <p><b>DEMONSTRATIONS OF KNOWLEDGE</b></p> <ol style="list-style-type: none"> <li>1.1 understanding of student learning &amp; development</li> <li>1.2 understanding of need for different learning approaches</li> <li>1.3 proficiency in reading, writing and mathematics</li> <li>1.4 understanding of central concepts &amp; skills, tools of inquiry and structures of discipline(s)</li> <li>1.5 knowledge of how to design and deliver instruction</li> <li>1.6 recognition of need to vary instructional methods</li> </ol> <p><b>APPLICATION OF KNOWLEDGE THROUGH</b></p> <ol style="list-style-type: none"> <li>2.1 instructional planning based upon knowledge of subject, students, curriculum &amp; community</li> <li>2.2 selection and/or creation of learning tasks that make subject meaningful for students</li> <li>2.3 establishment and maintenance of appropriate behavior standards and creation of positive learning environment</li> <li>2.4 creation of instructional opportunities supporting students' academic, social and personal development</li> <li>2.5 use of verbal, nonverbal and media communication fostering individual and collaborative inquiry</li> <li>2.6 employment of various instructional strategies in support of critical thinking, problem solving and skills demonstration</li> <li>2.7 use of various assessment techniques to evaluate student learning &amp; modify instruction</li> </ol> <p><b>DEMONSTRATION OF PROFESSIONAL RESPONSIBILITY THROUGH:</b></p> <ol style="list-style-type: none"> <li>3.1 professional conduct in accordance with the Code of Professional Responsibilities for Teachers</li> <li>3.2 shared responsibility for student achievement and well-being</li> <li>3.3 continuous self-evaluation regarding choices &amp; actions on students and school community</li> <li>3.4 commitment to professional growth</li> <li>3.5 leadership in the school community</li> <li>3.6 demonstrations of a commitment to students and a passion for improving the profession</li> </ol>

See course outline above

**DISABILITY ACCOMMODATION STATEMENT**

If any student has a particular disability-related need in order to participate in this course they should contact the Disability Resources Office (DRO) as soon as possible to obtain the appropriate documentation. Every effort will be made to accommodate students in this course.