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### CHEM 501.01: Teaching University Chemistry

Mark S. Cracolice

*University of Montana - Missoula*, [mark.cracolice@umontana.edu](mailto:mark.cracolice@umontana.edu)

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## Chemistry 501 Teaching University Chemistry Autumn 2000

- Instructor: Prof. Mark S. Cracolice, CP 101A, 243-4475, markc@selway.umt.edu
- Office Hours: MWF 8:15 AM–9:00 AM and by appointment. Chem 501 students are also welcome to drop by my office at any other time to discuss issues related to this course.
- Prerequisite: Completion of a general chemistry sequence. We will use instruction in general chemistry as the basis of the course, so it is necessary to have an understanding of the concepts taught and experience as a student in the course.
- Course Purpose: Preparation for teaching at the college level. We will examine “Science Teaching and the Development of Thinking” (Lawson, 1995), as applied to instruction in general chemistry.
- Lecture: R 4:10 PM–5:00 PM, Journalism 307. Attendance is essential.
- Optional: Herron, J.D. (1996). *The Chemistry Classroom: Formulas for Successful Teaching*. Washington, DC: American Chemical Society.  
More than anything else, I suggest this book because I hope that it will serve as a reference for you when you actually start teaching and begin to seek answers to the questions that will arise. An exercise based on this book will be assigned.
- Format: Each week, I will lecture on topics designed to help you obtain (a) a pedagogically sound theory base of science instruction, (b) a philosophy of science teaching that is consistent with the theory base, and (c) specific teaching methodologies than can be applied in the classroom that are consistent with the philosophy and the theory base.
- Schedule:
- | <u>Date</u> | <u>Topic</u>  |
|-------------|---|
| R 07 Sep    | Teaching and the Nature of Science                                    |
| R 14 Sep    | Patterns of Thinking by Scientists and by Adolescents                 |
| R 21 Sep    | Scientific Knowledge: Its Construction and Development                |
| R 28 Sep    | Stages in the Development of Procedural Knowledge                     |
| R 05 Oct    | The Learning Cycle  |
| R 12 Oct    | Characteristics of Effective Science Instruction                      |
| R 19 Oct    | Why Don't More Teachers Use Inquiry-Oriented Methods?                 |
| R 26 Oct    | Principles of Curriculum Development and Implementation               |
| R 02 Nov    | Student Assessment  |
| R 09 Nov    | Directions for Future Research and Development                        |
| R 16 Nov    | Neurological Models of Self-Regulation and Instructional Methods      |
| R 23 Nov    | <i>Thanksgiving Holiday</i>   |
| R 30 Nov    | The Role of Logical and Analogical Thinking in Knowledge Construction |
| R 07 Dec    | Research in Chemical Education I                                      |
| R 14 Dec    | Research in Chemical Education II                                     |

Grading:	Your course grade will be based on 14 equally weighted assignments:	
	<u>Due Date</u>	<u>Assignment (more details weekly)</u>
	R 14 Sep	The Central Purpose of American Education: Essay
	R 21 Sep	Classifying Thinking Patterns: Exercise
	R 28 Sep	Classifying Science Concepts: Exercise
	R 05 Oct	Piaget for Chemists: Essay
	R 12 Oct	Change a Traditional Lab into a Learning Cycle: Exercise
	R 19 Oct	Prepare a Lesson Plan from a Learning Cycle: Exercise
	R 26 Oct	Observations of Workshop Leaders: Report
	R 02 Nov	Concept Map of General Chemistry: Exercise
	R 09 Nov	Classifying Exam Items: Exercise
	R 16 Nov	Journal of Chemical Education Article: Exercise
	R 23 Nov	<i>Thanksgiving Holiday</i>
	R 30 Nov	Journal of College Science Teaching Article: Exercise
	R 07 Dec	Herron Chapter: Exercise
	R 14 Dec	Vitae
	R 21 Dec	Teaching Philosophy

Each is graded on a 10-point scale, for a total of 140 points.

A	90% to 100%	126–140 points
B	80% to 89.99%	112–125 points

We'll deal with lower grades should the occasion arise. I'll let you know if we need such a discussion.

**Drops:** Monday 25 September is the last day to drop by Dial Bear or Cyberbear. (It is also the last day to add.) Monday 16 October is the last day to drop with the signatures of your advisor and myself. After 16 October, you have made the decision to stay in the course until the end. After this date, you must have documented justification of a circumstance beyond your control to drop the course. This includes accident, illness, family emergency, etc. If this is the case, please submit your completed drop petition and a copy of the documentation to me.

**Other:** Any student in this course who has a disability that may prevent him or her from fully demonstrating his or her abilities should contact me personally as soon as possible so we can discuss accommodations necessary to ensure full participation and facilitate your educational opportunities.

This course syllabus is not a contract; it is a tentative outline of course policies. Changes may be made during the semester at my discretion.