

	Course	Knowing and Learning in Science and Mathematics NATS 3341 001
	Professor	Barbara Curry, MAT
	Teaching Asst.	Georgia Stuart
	Term	Spring 2013
	Meetings	MW 1:00 – 2:15pm, FN 2.202

Professor's Contact Information

Office Phone	972-883-4008
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Office Location	Founders North 3.308B
Email Address	barbc@utdallas.edu
Email Address	georgia.stuart@utdallas.edu
Office Hours	Monday 11:00-12:45, 2:30-5:00 Tuesday 3:00-5:00 Wednesday 11:00-12:45, 2:30-5:00 Other times by appointment.

General Course Information

Pre-requisites, Co-requisites, & other restrictions	Completion of Step 1 and completion of or concurrent enrollment in Step 2 An interest in teaching.
Course Description	A goal of this course is for participants to develop a powerful tool kit of theory-driven approaches to knowing and learning in mathematics and science. The focus is primarily on issues of what it means to learn and know science and mathematics in a way that is intended to broaden our sense of what is possible in our educational practices. Some of the questions that will be addressed in the course include: What are the standards for knowing we can use? How is knowing and learning structured, and how does what we know change and develop? For science and mathematics educators, what are the tensions between general, cross-disciplinary characterizations of knowing (e.g., intelligence or the conditioning of behavior) and the specifics of coming to understand powerful ideas in mathematics and science? What are the links between knowing and developing in learning theory, and the content and evolution of scientific ideas? What are the connections between kinds of assessments and theories of knowing? How are various uses of technology associated with specific approaches to learning? A broader and, hopefully, richer sense of what is possible is to support the kind of "power in action" that helps us become ever more effective and creative science and mathematics educators.
Learning Outcomes	*Students will construct models of knowing and learning to guide classroom practice. * Students will articulate various standards for knowing mathematics and science and articulate the implications of these standards for assessment, especially standardized assessment. *Students will articulate what it means to know and learn relative to cognitive structures and describe how what people know changes and develops. * Students will describe various paradigms for evaluating science and mathematics understanding.

	<p>*Students will use the clinical interview method to make sense of someone's reasoning about a topic in mathematics or science. Students will be able to evaluate science and mathematics content and apply it to the correct learning environment.</p> <p>*Students will describe the links between knowing and developing in learning theory and the content and evolution of scientific ideas.</p> <p>*Students will complete a Philosophy of Teaching as the first step in development of their portfolio</p>
Required Materials	<i>Internet Access, email communication, eLearning</i>
Suggested Texts, Readings, & Materials	<p><u>Required Textbook</u> Making Thinking Visible (MTV) Ritchart, Church, and Morrison ISBN 978-0-470-91551-6 (Also available as an eBook)</p> <p><u>Provided readings:</u> How People Learn (HPL) http://www.nap.edu/openbook.php?record_id=6160 Schools For Thought (SFT) http://cognet.mit.edu/library/books/view?isbn=0262521962 Preparing Teachers for a Changing World (PTCW) – See eLearning Other resources as needed – See eLearning</p>

Assignments & Academic Calendar

[Topics, Assignments, Due Dates, Exam Dates]

January 14	Course Introduction and Overview Reading Assignment: Class handout Complete: Technology Usage Survey through eLearning (under Assessments)
January 16*	Responsible Learning/Responsible Teaching Reading Assignment: See eLearning Complete: eLearning questions
January 23*	Learning Environments Reading Assignment: See eLearning Complete: eLearning questions
January 28	Thinking and Understanding
January 30*	Making Thinking Visible Reading Assignment: See eLearning Complete: eLearning questions Assign: First Clinical Interview
February 4	Nature vs. Nurture Novice vs. Expert I
February 6*	Novice vs. Expert II Reading Assignment: See eLearning Complete: eLearning questions
February 11	Technology Basics for Teaching and Learning I
February 13*	Technology Basics for Teaching and Learning II Reading Assignment: See eLearning Complete: eLearning questions Due: First Clinical Interview
February 18	Learning Theory I - Behaviorism
February 20*	Learning Theory II - Constructivism Reading Assignment: See eLearning Complete: eLearning questions.
February 25	Learning Theory III - Cognition
February 27	Learning Theory IV - Modern Theory
March 4	Learning and Transfer

March 6*	Mid-Term Exam Reading Assignment: See eLearning Complete: eLearning questions.
March 18	Classroom Strategies I Assign: Second Clinical Interview
March 20*	Classroom Strategies II
March 25	How Students Learn – Mathematics Instruction I
March 27*	How Students Learn: Mathematics Instruction II Reading Assignment: See eLearning Complete: eLearning questions
April 1	How Students Learn: Science Instruction I Reading Assignment: See eLearning Complete: eLearning questions
April 3*	How Students Learn: Science Instruction II
April 8	The Use of Models in the Classroom
April 10*	Model Eliciting Activities Reading Assignment: See eLearning Complete: eLearning questions Due: Second Clinical Interview
April 15	Anchored Instruction
April 17*	Teacher Learning Philosophy of Teaching Reading Assignment: See eLearning Complete: eLearning questions Assign: Teaching Philosophy Statement
April 22	Foundations of Assessment I
April 24*	Foundations of Assessment II
April 29	Putting It all Together Due: Teaching Philosophy Statement
May 1	Final Exam Review

Requirements

	All of the following requirements must be completed in order to pass this class. Designated assignments will be turned in through eLearning.	
	Class Attendance and Participation	Each Class Meeting*
	Reading response questions	As Assigned Weekly
	First Clinical Interview write-up	Due: February 13
	Mid-Term Exam	March 6
	Second Clinical Interview Write-up	Due: April 10
	Teaching Philosophy Statement	Due: April 29
	Final	TBA
	*Required as noted below	

Course Policies

<p>Grading (credit) Criteria</p>	<ul style="list-style-type: none"> •Readings 40% To be completed as noted in the schedule above. They will be completed through the Assessments link on eLearning. Questions will need to be completed by the beginning of the following class time. •Teaching Philosophy Statement 5% •Clinical Interview 1 10% To be completed utilizing the guidelines provided. •Clinical Interview 2 15% Interview in greater depth to be completed using guidelines provided. •Mid-Term exam 15% Analysis and application of concepts presented up to this point. •Final Exam 15% Analysis and application of concepts presented during the entire semester. <p>The semester grade will be determined by total number of points accrued in each category. An overall percentage will be calculated with the following grades applied:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">97-100% A+</td> <td style="width: 33%;">87-89% B+</td> <td style="width: 33%;">77-79% C+</td> </tr> <tr> <td>94-96% A</td> <td>84-86% B</td> <td>74-76% C</td> </tr> <tr> <td>90-93% A-</td> <td>80-83% B-</td> <td>70-73% C-</td> </tr> </table> <p>Any Grades calculated below 70% will be considered failing.</p>	97-100% A+	87-89% B+	77-79% C+	94-96% A	84-86% B	74-76% C	90-93% A-	80-83% B-	70-73% C-
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<p>Make-up Exams</p>	<p>Make-up exams will only be allowed under extreme circumstances. Students must contact the instructor prior to the exam to qualify.</p>									
<p>Late Work</p>	<p>Late work will be accepted with a 10% deduction in the grade for each day an assignment is late. This begins at the time the class ends on the assignment due date.</p>									
<p>Class Attendance</p>	<p>Required. An absence rate of greater than 10% will result in a letter grade reduction.</p>									
<p>Classroom Citizenship</p>	<p>Students are expected to present themselves as professionals and work in a cooperative learning environment. Cell phones will not be utilized during class time (to include calls, texting and web surfing)</p>									
<p>Field Trip Policies</p>	<p>N/A</p>									
<p>Student Conduct and Discipline</p>	<p>The University of Texas System and The University of Texas at Dallas have rules and regulations for the orderly and efficient conduct of their business. It is the responsibility of each student and each student organization to be knowledgeable about the rules and regulations which govern student conduct and activities. General information on student conduct and discipline is contained in the UTD publication, <i>A to Z Guide</i>, which is provided to all registered students each academic year.</p> <p>The University of Texas at Dallas administers student discipline within the procedures of recognized and established due process. Procedures are defined and described in the <i>Rules and Regulations, Board of Regents, The University of Texas System, Part I, Chapter VI, Section 3</i>, and in Title V, Rules on Student Services and Activities of the university's <i>Handbook of Operating Procedures</i>. Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations (SU 1.602, 972/883-6391).</p> <p>A student at the university neither loses the rights nor escapes the responsibilities of citizenship. He or she is expected to obey federal, state, and local laws as well as the Regents' Rules, university regulations, and administrative rules. Students are subject to discipline for violating the standards of conduct whether such conduct takes place on or off campus, or whether civil or criminal penalties are also imposed for such conduct.</p>									
<p>Academic Integrity</p>	<p>The faculty expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work</p>									

	<p>done by the student for that degree, it is imperative that a student demonstrate a high standard of individual honor in his or her scholastic work.</p> <p>Scholastic dishonesty includes, but is not limited to, statements, acts or omissions related to applications for enrollment or the award of a degree, and/or the submission as one's own work or material that is not one's own. As a general rule, scholastic dishonesty involves one of the following acts: cheating, plagiarism, collusion and/or falsifying academic records. Students suspected of academic dishonesty are subject to disciplinary proceedings.</p> <p>Plagiarism, especially from the web, from portions of papers for other classes, and from any other source is unacceptable and will be dealt with under the university's policy on plagiarism (see general catalog for details). This course will use the resources of turnitin.com, which searches the web for possible plagiarism and is over 90% effective.</p>
Email Use	<p><u>All email communication for this class should be done through eLearning.</u></p> <p>The University of Texas at Dallas recognizes the value and efficiency of communication between faculty/staff and students through electronic mail. At the same time, email raises some issues concerning security and the identity of each individual in an email exchange. The university encourages all official student email correspondence be sent only to a student's U.T. Dallas email address and that faculty and staff consider email from students official only if it originates from a UTD student account. This allows the university to maintain a high degree of confidence in the identity of all individual corresponding and the security of the transmitted information. UTD furnishes each student with a free email account that is to be used in all communication with university personnel. The Department of Information Resources at U.T. Dallas provides a method for students to have their U.T. Dallas mail forwarded to other accounts.</p>
Withdrawal from Class	<p>The administration of this institution has set deadlines for withdrawal of any college-level courses. These dates and times are published in that semester's course catalog. Administration procedures must be followed. It is the student's responsibility to handle withdrawal requirements from any class. In other words, I cannot drop or withdraw any student. You must do the proper paperwork to ensure that you will not receive a final grade of "F" in a course if you choose not to attend the class once you are enrolled.</p>
Student Grievance Procedures	<p>Procedures for student grievances are found in Title V, Rules on Student Services and Activities, of the university's <i>Handbook of Operating Procedures</i>.</p> <p>In attempting to resolve any student grievance regarding grades, evaluations, or other fulfillments of academic responsibility, it is the obligation of the student first to make a serious effort to resolve the matter with the instructor, supervisor, administrator, or committee with whom the grievance originates (hereafter called "the respondent"). Individual faculty members retain primary responsibility for assigning grades and evaluations. If the matter cannot be resolved at that level, the grievance must be submitted in writing to the respondent with a copy of the respondent's School Dean. If the matter is not resolved by the written response provided by the respondent, the student may submit a written appeal to the School Dean. If the grievance is not resolved by the School Dean's decision, the student may make a written appeal to the Dean of Graduate or Undergraduate Education, and the dean will appoint and convene an Academic Appeals Panel. The decision of the Academic Appeals Panel is final. The results of the academic appeals process will be distributed to all involved parties.</p> <p>Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations.</p>
Incomplete Grades	<p>As per university policy, incomplete grades will be granted only for work unavoidably missed at the semester's end and only if 70% of the course work has been completed. An incomplete grade must be resolved within eight (8) weeks from the first day of the subsequent long semester. If the required work to complete the course and to remove the incomplete grade is not submitted by the specified deadline, the incomplete grade is changed automatically to a grade of F.</p>
Disability Services	<p>The goal of Disability Services is to provide students with disabilities educational opportunities equal to those of their non-disabled peers. Disability Services is located in room 1.610 in the Student Union. Office hours are Monday and Thursday, 8:30 a.m. to 6:30 p.m.; Tuesday and Wednesday, 8:30 a.m. to 7:30 p.m.; and Friday, 8:30 a.m. to 5:30 p.m.</p>

	<p>The contact information for the Office of Disability Services is: The University of Texas at Dallas, SU 22 PO Box 830688 Richardson, Texas 75083-0688 (972) 883-2098 (voice or TTY)</p> <p>Essentially, the law requires that colleges and universities make those reasonable adjustments necessary to eliminate discrimination on the basis of disability. For example, it may be necessary to remove classroom prohibitions against tape recorders or animals (in the case of dog guides) for students who are blind. Occasionally an assignment requirement may be substituted (for example, a research paper versus an oral presentation for a student who is hearing impaired). Classes enrolled students with mobility impairments may have to be rescheduled in accessible facilities. The college or university may need to provide special services such as registration, note-taking, or mobility assistance.</p> <p>It is the student's responsibility to notify his or her professors of the need for such an accommodation. Disability Services provides students with letters to present to faculty members to verify that the student has a disability and needs accommodations. Individuals requiring special accommodation should contact the professor after class or during office hours.</p>
<p>Religious Holy Days</p>	<p>The University of Texas at Dallas will excuse a student from class or other required activities for the travel to and observance of a religious holy day for a religion whose places of worship are exempt from property tax under Section 11.20, Tax Code, Texas Code Annotated.</p> <p>The student is encouraged to notify the instructor or activity sponsor as soon as possible regarding the absence, preferably in advance of the assignment. The student, so excused, will be allowed to take the exam or complete the assignment within a reasonable time after the absence: a period equal to the length of the absence, up to a maximum of one week. A student who notifies the instructor and completes any missed exam or assignment may not be penalized for the absence. A student who fails to complete the exam or assignment within the prescribed period may receive a failing grade for that exam or assignment.</p> <p>If a student or an instructor disagrees about the nature of the absence [i.e., for the purpose of observing a religious holy day] or if there is similar disagreement about whether the student has been given a reasonable time to complete any missed assignments or examinations, either the student or the instructor may request a ruling from the chief executive officer of the institution, or his or her designee. The chief executive officer or designee must take into account the legislative intent of TEC 51.911(b), and the student and instructor will abide by the decision of the chief executive officer or designee.</p>
<p>Off-Campus Instruction and Course Activities</p>	<p>Off-campus, out-of-state, and foreign instruction and activities are subject to state law and University policies and procedures regarding travel and risk-related activities. Information regarding these rules and regulations may be found at http://www.utdallas.edu/BusinessAffairs/Travel_Risk_Activities.htm. Additional information is available from the office of the school dean.</p>

These descriptions and timelines are subject to change at the discretion of the Professor.