**Instructor:** Dr. Greg Hale  
**Office Number:** 105 LS  
**Office Telephone Number:** 817-272-3807  
**Email Address:** greghale@uta.edu  
**Office Hours:** Sign up for an appointment here: https://calendly.com/greghale  
**Faculty Profile:** https://www.uta.edu/profiles/gregory-hale

**Section Information:** BIOL, PHYS, CHEM, GEOL 4343-001, plus 4343-101 or 4343-102

**Time and Place of Class Meetings:**  
**Lecture:** Fridays, 4:00-5:50 p.m., 226 Science Hall  
**Laboratory (section 101):** Tuesdays, 3:30-5:20 p.m., 138 Life Science  
**Laboratory (section 102):** Wednesdays, 4:00-5:50 p.m., 138 Life Science

**Description of Course Content:** This course will enable UTeach students to experience hands-on the tools that scientists use to solve scientific problems. There will be a focus on the mathematics used by scientists in the way that scientists use it. Students will engage in designing experiments, formulating hypotheses, collecting data, using statistics, reading and evaluating the scientific literature, writing and reviewing scientific papers, and making oral presentations of scientific research.

**Student Learning Outcomes:** Students will gain experience in conducting scientific experiments, analyzing data, and giving written and oral presentations of their results. They will also be reviewing each other's presentations. Students will be immersed in the process of scientific inquiry so that when they become teachers, they will be able to instruct their own students in how to approach questions scientifically.

**Required Textbooks and Other Course Materials:**
1. *Research Methods for Science* by Michael P. Marder, 2011, Cambridge University Press. Students will be provided with the text and other course handouts via the course’s Blackboard site. Additional reading will be required of literature available electronically through UT Arlington's library.
2. A lab notebook.
3. Tk20: (If you have already purchased Tk20, you may still access the software this semester and do not need to purchase it again.) The College of Education has implemented Tk20, a comprehensive data management system that provides powerful tools to manage growth and streamline processes to meet your needs more efficiently and effectively. The set of tools that is required as a course text is called TK20 HigherEd. The following is a partial listing of what the Tk20 system will enable you to do:
   - Create your key assessments and performance artifacts online, which you will be able to access and use beyond graduation. This will enable you to present documented performance data and information to prospective employers, who are increasingly interested in data-supported evidence of an individual’s current and potential performance.
   - Submit forms online, including applications for field-based experiences such as student teaching, practicum, internships, or other clinical practice required for teacher or administrator certification, and receive timely notification of placement details sent to your Tk20 account.
   - Create multimedia portfolios for documenting your work for presentation to faculty and prospective employers that can be exported to CDs or other media.
   - Monitor your progress throughout the program and have access to a fully documented record of your program performance, creating a vested partnership between you and faculty in your progress through your academic program.

On-line tutorials and training materials will orient you to the Tk20 system and its use. For additional information, go to https://www.uta.edu/coed/academics/tk20/.
Attendance: At The University of Texas at Arlington, taking attendance is not required but attendance is a critical indicator of student success. Each faculty member is free to develop his or her own methods of evaluating students’ academic performance, which includes establishing course-specific policies on attendance. As the instructor of this section, I have decided that attendance is mandatory and will be incorporated into the student’s grade. While UT Arlington does not require instructors to take attendance in their courses, the U.S. Department of Education requires that the University have a mechanism in place to mark when Federal Student Aid recipients “begin attendance in a course.” UT Arlington instructors will report when students begin attendance in a course as part of the final grading process. Specifically, when assigning a student a grade of F, faculty report must the last date a student attended their class based on evidence such as a test, participation in a class project or presentation, or an engagement online via Canvas. This date is reported to the Department of Education for federal financial aid recipients.

Grading: Students are expected to keep track of their performance throughout the semester and seek guidance from available sources (including the instructor) if their performance drops below satisfactory levels. Grades will be calculated as follows:

- 10 pts. Attendance
- 25 pts. Homework assignments
- 5 pts Inquiry 1
- 2 pts Inquiry 2 proposal
- 3 pts Inquiry 2 draft
- 3 pts Inquiry 2 oral presentation
- 10 pts Inquiry 2 final writeup (will only be graded if preceding assignments were completed)
- 10 pts Inquiry 3 writeup
- 2 pts Inquiry 4 proposal
- 5 pts Open Question presentation
- 5 pts Inquiry 4 draft
- 5 pts Inquiry 4 oral presentation
- 15 pts Inquiry 4 final write-up (will only be graded if preceding assignments were completed)

Late assignments will lose 10% of the value of the assignment for each day it is late. The Inquiry final write-ups will be graded according to a rubric in your course packet. Final Inquiries must be related to the subject for which you have enrolled, e.g., if you are in BIOL 3310, your final inquiry must be a biology inquiry. There will be no exams in this course.

Final grades will be determined on a strict scale: 90.0-100 A, 80.0-89.9 B, 70.0-79.9 C, 60.0-69.9 D, 0-59.9 F.

Descriptions of major assignments and examinations: Students are required to complete 11 homework assignments and four major inquiries over the course of the semester that include oral or written assignments. Assignments are available in Blackboard. In addition, there is one presentation of an open question topic.

Expectations for Out-of-Class Study: Beyond the time required to attend each class meeting, students enrolled in this course should expect to spend at least an additional 2-6 hours per week of their own time in course-related activities, including reading required materials, completing assignments, etc.

Campus Carry: Effective August 1, 2016, the Campus Carry law (Senate Bill 11) allows those licensed individuals to carry a concealed handgun in buildings on public university campuses, except in locations the University establishes as prohibited. Under the new law, openly carrying handguns is not allowed on college campuses. For more information, visit http://www.uta.edu/news/info/campus-carry/

Grade Grievances: Any appeal of a grade in this course must follow the procedures and deadlines for grade-related grievances as published in the current University Catalog.
<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Project in Progress</th>
<th>Reading</th>
<th>Homework Start</th>
<th>Due Dates</th>
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<tbody>
<tr>
<td>Lab (1/21,22)</td>
<td>Balloons: Inquiry I preparation Experimental design</td>
<td>Inquiry I</td>
<td>Chapters 1 &amp; 2</td>
<td>1 (Inquiry Grading)</td>
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<td>24 Jan</td>
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<tr>
<td>Lab (1/28,29)</td>
<td>Safety, Inquiry II</td>
<td>Inquiry II</td>
<td>Chapter 5</td>
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<td>Inquiry I</td>
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<tr>
<td>31 Jan</td>
<td>Evaluate Seilman Paper; Sagan Paper Analysis</td>
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<td>Sample Inquiries</td>
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<td>Lab (2/4,5)</td>
<td>Graphical analysis of data; Inquiry II</td>
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<tr>
<td>7 Feb</td>
<td>Statistics: sampling, averaging</td>
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<td>Appendix A, Chapter 3</td>
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<td>Lab (2/11,12)</td>
<td>Inquiry II Scientific literature &amp; searching</td>
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<td>14 Feb</td>
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<td>Lab (2/18,19)</td>
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<td>Lab (2/25,26)</td>
<td>Inquiry III Open Question Topic Selection</td>
<td>Inquiry III</td>
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<td>Homework 4</td>
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<td>28 Feb</td>
<td>Statistics: Inquiry II Mock Data Analysis</td>
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<td>Lab (3/3,4)</td>
<td>Inquiry III and χ²</td>
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<td>7 (χ²)</td>
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<td>6 Mar</td>
<td>Inquiry II Partner Grading</td>
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<td>5 (assess inq)</td>
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<td>Lab (3/17,18)</td>
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<td>Inquiry IV Pres.</td>
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<td>Lab (3/24,25)</td>
<td>Inquiry IV proposal review</td>
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<td>Inquiry IV Proposal draft</td>
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<td>27 Mar</td>
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<td>Inquiry IV Final</td>
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<td>Lab (3/31,4/1)</td>
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<td>10 (open question)</td>
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<td>Modeling: Order of Magnitude</td>
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<td>Lab (4/7,8)</td>
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<td>Homework 8</td>
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<td>10 Apr</td>
<td>Modeling: M&amp;M’s</td>
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<td>Chapter 4</td>
<td>8 (Estimation)</td>
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<td>9 (M&amp;Ms)</td>
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<td>Open Q Pres.</td>
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<td>Lab (4/21,22)</td>
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<tr>
<td>24 Apr</td>
<td>Open Question Presentations</td>
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<td>Lab (4/28,29)</td>
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<td>1 May</td>
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<td>11 (Inquiry Grading)</td>
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<td>8 May</td>
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<td>Inquiry IV Final</td>
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<td>Week</td>
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<td>turn in on Tk20</td>
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As the instructor for this course, I reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course. – Dr. Greg Hale
Institutional Information: UTA students are encouraged to review the below institutional policies and informational sections and reach out to the specific office with any questions. To view this institutional information, please visit the Institutional Information page (http://www.uta.edu/provost/administrative-forms/course-syllabus/index.php), which includes the following policies among others:

- Drop Policy
- Disability Accommodations
- Title IX Policy
- Academic Integrity
- Student Feedback Survey
- Final Exam Schedule

Mandatory Lab Safety Training: Students registered for this course must complete the University’s required “Lab Safety Training” prior to entering the lab and undertaking any activities. Students should complete the required module as soon as possible, but no later than their first lab meeting. Until all required Lab Safety Training is completed, a student will not be given access to lab facilities, will not be able to participate in any lab activities, and will earn a grade of zero for any uncompleted work.

1. Students must enroll themselves into the Lab Safety Training course at https://uta.catalog.instructure.com/ by clicking on the “Lab Safety Training” course available there. Follow instructions to enroll.
2. Login to Canvas at https://uta.instructure.com with your NetID and password.
3. Under Courses, click Lab Safety Training.
4. Follow the instructions, work your way through all of the modules and complete the two quizzes with a score of 80% or greater on each one in order to complete the training.

Once completed, Lab Safety Training is valid for the remainder of the same academic year (i.e. September through next August) for all UTA courses that include a lab. If a student enrolls in a lab course in a subsequent academic year, he/she must complete the required training again.

General questions about the Lab Safety Training, including content or enrollment should be directed to the Office of Environmental Health and Safety at ehsafety@uta.edu or (817) 272-2185. All technical questions or problems with online training should be directed to the Canvas Support Hotline either online or by calling (855) 597-3401.

Electronic Communication: UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at http://www.uta.edu/oit/cs/email/mavmail.php.

Emergency Exit Procedures: Should we experience an emergency event that requires us to vacate the building, students should exit the room and move toward the nearest exit, which is located to the right as you exit the lab (138 Life Science) and as you exit the classroom (226 Science Hall). When exiting the building during an emergency, one should never take an elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist individuals with disabilities.

Student Support Services: UT Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. Resources include tutoring by appointment, drop-in tutoring, etutoring, supplemental instruction, mentoring (time management, study skills, etc.), success coaching, TRIO Student Support Services, and student success workshops. For additional information, please email resources@uta.edu, or view the Maverick Resources website (http://www.uta.edu/studentsuccess/success-programs/programs/resource-hotline.php).

The IDEAS Center (2nd Floor of Central Library) offers free tutoring to all students with a focus on transfer students, sophomores, veterans and others undergoing a transition to UT Arlington. To schedule an appointment with a peer tutor or mentor email IDEAS@uta.edu or call (817) 272-6593.
The English Writing Center (411LIBR): The Writing Center Offers free tutoring in 20-, 40-, or 60-minute face-to-face and online sessions to all UTA students on any phase of their UTA coursework. Our hours are 9 am to 8 pm Mon.-Thurs., 9 am-3 pm Fri. and Noon-6 pm Sat. and Sun. Register and make appointments online at http://uta.mywconline.com. Classroom Visits, workshops, and specialized services for graduate students are also available. Please see www.uta.edu/owl for detailed information on all our programs and services.

The Library’s 2nd floor Academic Plaza offers students a central hub of support services, including IDEAS Center, University Advising Services, Transfer UTA and various college/school advising hours. Services are available during the library’s hours of operation. http://library.uta.edu/academic-plaza

Librarian to Contact:  
Biology  
Gretchen Trkay  
817.272.5352  
gtrkay@uta.edu  

Chemistry  
Antoinette Nelson  
817.272.7433  
nelson@uta.edu  

Geology  
Andy Herzog  
817.272.7517  
amherzog@uta.edu  

Math  
Martin Wallace  
817.272.5336  
martin.wallace@uta.edu  

Physics  
Andy Herzog  
817.272.7517  
amherzog@uta.edu  

Emergency Phone Numbers: In case of an on-campus emergency, call the UT Arlington Police Department at 817-272-3003 (non-campus phone), 2-3003 (campus phone). You may also dial 911. Non-emergency number 817-272-3381