



North Carolina Agricultural and Technical State University
Division of University Studies
Analytical Reasoning

University Studies is a bold, new approach to general education. Until now, general education utilized distribution requirements, which asked students to choose randomly among a list of introductory courses in the humanities, social and natural sciences. Exposing students to a wide variety of subject matter and critical approaches was the primary objective of this educational tradition. Thus, little attention was paid to the ways students might synthesize or profit from the learning objectives and outcomes of different disciplines. As a result, students proceeded into their major studies with few identifiable skills and abilities gleaned from their general education experience. University Studies was conceived to redress these problems.

The rationale for an interdisciplinary approach to general education stems from the acknowledged complexities of the contemporary world. The problems facing modern humanity are rarely if ever understood using the perspectives and tools of a single discipline. Hence, University Studies maintains that critical thinking, logic, writing, humanistic and artistic inquiry, as well as the social and natural sciences are best understood via interdisciplinary methods. Indeed many interdisciplinary fields, such as African American Studies, Science and Technology Studies, Cultural Studies, and Women's Studies developed due to either the unwillingness or the inability of the traditional disciplines to address the issues posed in these bodies of scholarship.

All University Studies [UNST] courses are interdisciplinary. This means that they combine the intellectual methods and subject matter from a variety of disciplines in order to help students learn critical thinking and problem solving. UNST courses are interconnected in such a manner that they can guarantee that a student will be exposed to specified learning objectives that address real-life concerns. During the first year, students will learn skills for critical engagement; during the second and third years, students will apply these newly honed skills in theme-based courses; in the senior year, students will exercise the skills and knowledge they have gained in a capstone experience and service-learning activity. If the University Studies curriculum is undertaken seriously and with intentionality, UNST students can expect to emerge with a set of useful intellectual tools that will allow them to engage effectively a dynamic and complex world.

COURSE DESCRIPTION

The course engages students in scientific, quantitative, and logical reasoning processes to prepare them to interpret and solve problems encountered in everyday life. Students will consider concepts from logic and the scientific disciplines, including life, social, and physical sciences. The scientific method and a variety of analytical approaches are explored, including numerical, graphical, verbal / logical, and algebraic reasoning.

NORTH CAROLINA AGRICULTURAL AND TECHNICAL STATE UNIVERSITY
GENERAL EDUCATION GOALS

UNST130 Analytical Reasoning includes the follow four of the seventeen stated university goals:

5. Use Analytical thinking skills to evaluate information critically.
6. Apply multiple modes of inquiry, including quantitative and qualitative analysis, to formulate, describe, evaluate, and solve problems.
7. Apply scientific reasoning skills to model natural, physical, social, and aesthetic phenomena using multiple modes of inquiry.
8. Use a wide range of disparate information and knowledge to draw inferences, test hypotheses, and make decisions.

UNST 130 SPECIFIC LEARNING OBJECTIVES

In this course students will:

- (1) Think analytically and critically about the nature of statements and arguments.
 - a. Identify conclusions, supporting reasons, and evidence in written and oral passages.
 - b. Distinguish between arguments and other forms of communication.
 - c. Distinguish between inductive and deductive arguments.
 - d. Apply principles of deductive reasoning to assess hypothetical syllogisms.
 - e. Apply principles to evaluate
 - f. Evaluate inductive and deductive arguments.

- (2) Interpret statistical data and concepts including: mean, median, mode, randomization, sample size, margin of error, standard deviation, statistical significance, among others.
 - a. Identify populations and samples.
 - b. Select simple random samples from populations.
 - c. Calculate mean, median, mode, and standard deviations of data sets.
 - d. Compute, analyze, and interpret different presentations of central tendency.
 - e. Evaluate statistical significance of variation.
- (3) Interpret data presented in graphs, charts and tables.
 - a. Identify basic components of graphs, charts, and tables.
 - b. Analyze graphs for information and coherence.
 - c. Evaluate graphs for clarity, distortion, and ambiguity.
- (5) Understand interest, mortgages, and home buying.
 - a. Calculate simple interest, compound interest, loans, and mortgages.
 - b. Apply affordability guidelines for home buying.
 - c. Evaluate budgets and home purchasing proposals.
- (7) Interpret and apply the basic structure of scientific method.
 - a. Identify differences and relationships among observation, hypothesis formation, testing of hypotheses, and peer review.
 - b. Analyze and evaluate analogical arguments.
 - c. Analyze and evaluate arguments that employ analogical reasoning for the purpose of identifying causal connections.
 - d. Distinguish causality from correlation
 - e. Distinguish between scientific reasoning and superstition
 - f. Analyze and evaluate research methods

REQUIRED TEXT:

UNST 130 Analytical Reasoning, Boss and Bluman, McGraw Hill, 2009.

ALSO REQUIRED: TurningPoint Personal Response Device (“clicker”), Scientific Calculator

GRADING

Grades for this course will be determined according to a method known as “curving.” A grading curve assumes that a large group of students will perform in predictable or normal ways, resulting in a distribution of scores that can be graphed such that it looks like a “bell curve” (see pp. 266-73 or pp. 446-71 of the *Analytical Reasoning* course textbook for discussions of normal curves). In a statistically normal group, there will be a relatively small but equal number of students who perform very well and very poorly, while the majority of students will perform at or near a mid-point. Grades are assigned by dividing the distribution into five sections that correspond to excellent performance (A), superior performance (B), average performance (C), below average performance (D), and very low performance (F). In this method of grading, grades are assigned relative to the performance of all other students in the group. For this class, the group will consist of all students taking *Analytical Reasoning* during the **fall semester, 2009** with the exception of the honors classes. Each student will be assigned a grade based on her or his performance in relation to all other students taking *Analytical Reasoning*, regardless of the section. Each exam will be curved using an adjusted mean and standard deviation. The mean of an exam will be a “C”, and the standard deviation will be one letter grade (10 percentage points). As you will learn in this course “standard deviation” is a measure of the spread of the “bell shaped curve”.

The grading curve will be adjusted to a standard scale: 100-90 = A; 89-80 = B; 79-70 =C; 69-60 = D; 59—F.

Summative Grades will be determined according to the following:

Examination #1	10%
Examination #2	20%
Examination #3	20%
Examination #4	25%
Homework	20%
Participation	5%

QUIZZES AND HOMEWORK

- Quizzes and homework will be administered primarily through Blackboard.

SUPPLEMENTAL INSTRUCTION AND EXTRA CREDIT

The Division of University Studies is providing 50 minute Supplemental Instruction sessions available to all current UNST130 (Analytical Reasoning) students. The Supplemental Instruction sessions' primary purpose is to provide opportunities for students to explore difficult course content through structured activities and collaborative work. Students ***actively and constructively participating*** in these sessions will receive extra credit. Determining whether a student will receive extra credit for a session is at the sole discretion of the session instructor. A student may attend as many Supplemental Instruction sessions as he/she wishes, but the maximum extra credit that can be earned is limited to 1% in one week. The maximum extra credit that can be earned during the entire course is 10%. The percent earned by each student during the course of the semester will be added to the final grade of the student at the end of the semester. Instructors will take attendance during the sessions, and only those students who arrive no more than 10 minutes after the session begins and remain present until class is dismissed will receive extra credit for the session.

A Supplemental Instruction session schedule of times, instructors, and locations will be posted on Blackboard. Students may attend *any* SI session at their convenience and are not limited to those taught by their individual UNST 130 instructor(s). Any session attended will be considered for credit. Sessions will begin the 2nd week of class.

ACADEMIC DISHONESTY POLICY

Academic honesty is absolutely essential. Cheating, plagiarism, **sharing of clickers** or other academic misconduct will not be tolerated. If you are caught cheating, you will not pass this course and will be subject to any and all penalties specified in the student honor code. If a student is found cheating, she or he will receive an "F" for that assignment. If a student is found cheating a second time, she or he will receive an "F" for the course. PLEASE NOTE THAT USING A "CLICKER" FOR A FRIEND CONSTITUTES ACADEMIC DISHONESTY. HAVING TWO "CLICKERS" IN CLASS WILL BE INTERPRETED AS ACADEMIC DISHONESTY. See pages 78-80 of the Undergraduate Bulletin 2006-2008 for the NCATSU Academic Dishonesty Policy.

UNIVERSITY STUDIES ATTENDANCE POLICY

University Studies strives to professionalize its students; therefore, regular attendance and punctuality are expected in all UNST courses. Attendance will be taken at the beginning of each class. Tardiness will not be tolerated. Absent or tardy students are responsible for any missed class work, including any changes to the syllabus or assignments announced in class. In short, absences and tardiness can/will diminish your grade. If you suffer prolonged illness or misfortune, you should consider dropping the course. Persistent tardiness and failure to observe established classroom etiquette will lead to failure of the course. Student athletes must submit a schedule of days they will be absent within the first week of classes.

Students will automatically receive an "F" for missing beyond the equivalent of two weeks of class:

- M, W, F Schedule: Six (6) unexcused absences
- T, R Schedule: Four (4) unexcused absences
- 1-Class Per Week Schedule: Two (2) unexcused absences

At half the allotted absences (three (3) absences for M, W, F schedule; two (2) for T, R schedule; and one (1) for 1-class per week schedule), students are required to meet with their instructor(s) for a mandatory one-on-one conference concerning his/her performance in class. It is the student's responsibility to meet with the instructor within one week of missing the equivalent of one week of class.

Absence or tardiness is only excused for emergency situations. Students are responsible for submitting acceptable documentation for the excused absence within one week of the absence. Examples of acceptable documentation include:

- Written doctor's note specifically requesting an excused absence (with the specific time and date on the notification)
- Obituary or service notice
- An official written summons to court

Student-athletes are held to the same attendance and performance expectation as non-athletes. Hence, they should coordinate their course schedules so that team practices and games do not conflict with class meetings and / or exams. Student-athletes should identify themselves to their professors and instructors, submit a schedule of days they will miss class as well as the name and contact information for their coach within the first week of classes. University Studies will follow the Department of Athletics class attendance policy, which states:

- **First Unexcused Absence** – The student-athlete's coach will be notified.
- **Second Unexcused Absence** – Ms. Dee Todd, Director of Intercollegiate Athletics will be notified. The student-athlete will be required to have a conference with Ms. Todd or her designee.
- **Third Unexcused Absence** – The student athlete will be suspended for one contest. IF the student-athlete is not currently in season, the suspension will apply to the following season.
- **Fourth Unexcused Absence** – The student-athlete's scholarship is subject to non-renewal.

COURSE MATERIALS

- **Books:** Serious scholarship requires procurement of essential course materials. Students will purchase all books and materials required for UNST courses within the first two weeks of the semester. Sharing of books thereafter is prohibited.
- **Blackboard:** Students are required to be familiar with the use of Blackboard. Information, assignments, tests and quizzes will be given on Blackboard; therefore, students must be able to navigate the site successfully in to do well in the course. If you are having problems with Blackboard, it is the student's responsibility to make the professor aware of your problems.

EDUCATIONAL ETIQUETTE

Students will demonstrate respect for their professors and colleagues. Any behavior that distracts (e.g., eating, talking while others are talking, etc.) or is disrespectful (inattention, personal attacks, studying for other courses during class, etc.) is unacceptable. Differences of opinion should be met with intellectual curiosity and rigor rather than insult, contumely, or discord.

All cell phones, pagers, and personal communication devices must be turned off for the duration of the class period. Students who fail to comply with this rule will be asked to leave the class and will be marked absent. Campus security will be asked to escort those students from the classroom who fail to leave as requested.

There will be no eating or drinking in class (other than bottled water).

Student success in this course depends upon the development of scholarly and collegial habits. Active participation in class discussion and group work is mandatory. Collegial responsibility and respect are also compulsory.

EMAIL POLICY

Official correspondence from faculty, instructors, and graduate assistants will use the NCAT email address. Students are responsible for the information received and are required to monitor their email accounts on a regular basis.

All faculty, instructors, and graduate assistants will reply to legitimate email inquiries from students within 48 hours with the exception of weekends or university holidays. If you do not receive a reply within this period, please resubmit your question(s) or phone your instructor. Leave a message if necessary.

In accordance with the Aggie Pride Code, students should consistently communicate and behave in a manner that displays integrity, honesty, and sound character when using email to communicate with faculty, instructors, or graduate teaching assistants.

Each email message must include the course name and number, section number, and a concise and clear statement of purpose in the subject line otherwise it is likely to be deleted, along with spam messages and messages potentially containing viruses. You must also type your name, as it appears on the course roster at the end of your message.

Please make sure you consult the course outline/syllabus, other handouts, and the course website **BEFORE** submitting inquiries by email.

When a question cannot be easily or briefly answered by email, your instructor will simply indicate that the student should see him, her, or the appropriate TA during office hours.

Email should **NOT** be seen as an alternative to meeting with your instructor or the TA during office hours. Nor should email be used as a mechanism to receive private tutorials (especially prior to tests) or to explain material that was covered in lectures you missed.

TIMELY SUBMISSION OF WORK

All assignments are due on the dates indicated in your syllabus. **No late work will be accepted in any UNST course.** Exceptions will be made only in cases of documented medical or family emergency or religious observance. Please notify your professor by email *before the assignment is due* should an acceptable absence occur. Employment, childcare or other academic pressures do not constitute a valid excuse for late work. Except for the provisions for Supplemental Instruction, there is no provision for additional papers or extra credit to substitute for missed course requirements.

OPEN DOOR POLICY

Each of your instructors maintains an open door policy. You are free to visit us during the posted office hours or, if you prefer a different time, arrange an appointment. If you are having a problem with the course, please contact your instructor immediately; problems, unlike fine wines, do not improve with age.

DISABILITIES AND DIFFERENCES

Students with documented learning disabilities or differences should identify themselves to their professor and present appropriate documentation during the first week of classes. No accommodations will be made later in the semester for students who do not identify themselves at the beginning of the course.

Students who need developmental support should ask their professors for extra help or referral. All students should seek the support services of the Writing Center (A-309 GCB; 334-7764) and the Center for Student Success (312 Hodgin Hall; 334-7855).

UNST 130 Class Schedule

Dates	<u>Outline of Topics to be Covered</u>	Readings
August 17-21	<i>Pretest</i> <i>Introduction: Syllabus, Blackboard, Clickers</i> <i>Recognizing an Argument,</i> <i>Breaking Down an Argument</i> <i>Evaluating an Argument</i>	pp. 78-81 pp. 81-82 pp. 88-91
August 24-28	<i>What is an Inductive Argument?</i> <i>Generalization</i>	pp. 107-110 pp. 110-119
August 31- Sept 4	<i>Analogies</i>	pp. 120-125
September 7 Labor Day Holiday	No Class	
September 8-11	<i>Picturing Data</i>	pp. 334-344
<u>Monday and Tuesday</u> <u>September 14-15</u>	<u>Examination #1</u>	
September 16-18	<i>What is a Deductive Argument?</i> <i>Types of Deductive Arguments</i>	pp. 143-147 pp. 147-153
September 21-25	<i>Hypothetical Syllogisms</i>	pp. 153-158
September 28-Oct. 3	<i>Causal Arguments</i>	pp. 125-131
October 5-9	<i>What is Science?</i> <i>The Scientific Method</i>	pp. 177-184 pp. 184-189
<u>Monday and Tuesday</u> <u>October 12-13</u>	<u>Examination #2</u> <i>The Scientific Method</i> <i>Evaluating Scientific Hypotheses</i> <i>(Second Half Faculty Members begin on</i> <i>Wednesday, October 14)</i>	pp. 184-189 pp. 189-194
October 19-20 Fall Break	No Class	
October 21-23	<i>Research Methodology and Scientific Experiments</i> Midterm Grades Due: October 22	pp. 194-203
October 26-30	<i>Interest</i> No Class: October 29 10:00 AM – 12:00 PM Homecoming	pp. 224-236
November 2-6	<i>Home Ownership</i>	pp. 244-250

<u>Monday and Tuesday</u> <u>November 9-10</u>	<u>Examination #3</u>	
November 11-13	<i>The nature of Statistics and Organizing Data</i>	pp. 324-334
November 16-20	<i>Measures of Average</i> <i>Measures of Variation</i>	pp. 345-355 pp. 355-359
November 23-24	<i>The Normal Distribution</i>	pp. 364-375
November 25-27	<i>Thanksgiving Holidays</i>	No Classes
November 30 - Dec 4	Comprehensive Review Days	Review of the Entire Course
December 5	Reading Day	
December 7-11	Final Examination Week	Time and Date is not Negotiable: Please Make Arrangements

This syllabus is subject to revision as necessary at any time during the semester.

Exam Dates, Including the Final Exam, are not Negotiable: Please Make Arrangements

http://www.ncat.edu/~registra/fall_2009_exam_schedule.htm

This syllabus was revised 8-14-09

IRB INFORMED CONSENT NOTIFICATION

Dear Student,

I invite you participate in a research project to study teaching and learning pedagogies in UNST 130 Analytical Reasoning at NCATSU. The results of this project will be used to assess the effectiveness of teaching strategies and techniques employed in UNST 130. Through your participation I hope to understand the extent to which TurningPoint audience response questions, practice exams, online homework, Blackboard chatrooms, group projects, and other learning techniques and strategies employed in UNST 130 help students achieve the stated learning objectives of the course. I hope that the results of the survey will be useful for future UNST students, and diverse learning communities across the world. I hope to share my results by publishing them in scientific journals and presenting them at academic conferences.

I do not know of any risks to you if you decide to participate in this survey and we guarantee that your responses will not be identified with you personally. I promise not to share any information that identifies you with anyone outside our research group.

Your participation is voluntary and there is no penalty if you do not participate. Regardless of whether you choose to participate, please let me know if you would like a summary of my findings. To receive a summary, please write to me at glbailey@ncat.edu.

If you have any questions or concerns about this project or how your assessment information will be used, you may contact Dr. Gary Bailey at glbailey@ncat.edu. This project has been approved by the Institutional Review Board (IRB) at North Carolina A&T State University.

If you have any questions about your rights as a research study participant, you may contact the chair of the IRB through Compliance Office at (336) 334-7995 or rescomp@ncat.edu.

Sincerely,

Gary L. Bailey, Ph.D.
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North Carolina Agricultural and Technical State University
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