2020

AGRO 153 - Soil Resources Online - A Peer Review of Teaching Project Benchmark Portfolio

Rebecca Young

Peer Review of Teaching Project, 2019-2020

Benchmark Portfolio

AGRO 153 - Soil Resources Online

Rebecca A. Young, Ph.D.

Assistant Professor of Practice - Soils
Department of Agronomy and Horticulture
University of Nebraska-Lincoln
ryoung@unl.edu

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ABSTRACT

Soil Resources (AGRO 153) is a high enrollment, introductory-level course taken by a diverse range of student majors at the University of Nebraska-Lincoln (UNL), predominantly from the College of Agricultural Science and Natural Resources (CASNR). Students that enroll in this course typically span all undergraduate class levels, and a small number of graduate students fulfilling degree requirements or prerequisites. AGRO 153 online is a smaller enrollment section of the course that is often taken by students when (a) the resident sections have closed due meeting maximum capacity, (b) there is a timing conflict within their course schedule, or (c) the student is enrolled in an online program or completing courses remotely. This course portfolio focuses on efforts to improve students' ability to identify, relate, and describe soil profile characteristics to soil forming factors and processes. It includes a discussion on the development of an interactive lecture video with embedded concept questions, the implementation of pre- and post-surveys to evaluating student learning in association with the video, and comparison of assessments to previous semesters. The results show there was no overall impact on student learning or performance with this new activity, compared to three previous semesters.

COURSE DESCRIPTION

Soil Resources (AGRO 153) is a course that introduces students to the broad components and topics within the extensive realm of soil science, with resident and online sections. Soil is predominantly studied and utilized as a medium for plant growth, as a regulator of water supplies, as decomposer of raw materials, as a habitat for organisms, and as a landscaping and building medium, in addition to serving a vital role in supporting all life on Earth. Understanding soil is of great importance and relevant to our students future careers, their lives outside of the classroom now and in the future, and in developing their skills to better understand and respond to our ever-changing world. AGRO 153 online is a course in which students learn how to identify, describe, and interpret soil properties, dynamics, and impacts on other Earth systems through readings and videos, self-study worksheets, and virtual lab activities. The course objectives, listed in the course syllabus (Appendix A), are for students to:

1. Explain the multiple functions of soil in the global ecosystem and how land use and/or management may impact soil functions and soil erosion.
2. Describe soil profiles and relate profile characteristics to soil forming factors and processes.
3. Describe soil physical properties of texture, structure, density, and porosity, and relate these to soil water holding capacity, plant available water, and infiltration.
4. Describe soil chemical properties of clay and organic colloids, ion exchange, and acidity, and the relationship to soil type and general soil fertility for plant growth.
5. Classify types of soil organisms and describe their roles in the carbon and nitrogen cycles.
6. Explain how abiotic and management factors influence ecological cycles of carbon and nitrogen.

Soil Resources is an introductory-level course that is required for Agronomy, Horticulture, Environmental Science, Water Science, Applied Climate Science, Landscape Architecture, and Regional and Community Forestry, as well as Fisheries and Wildlife majors pursuing Wildlife Ecology and Management or Habitat Management options. The course is also highly recommended for most majors in within the College of Agricultural Sciences and Natural Resources (CASNR), including students in programs within the Biological Sciences Engineering (BSE) and Agricultural Leadership, Education and Communication (ALEC) programs. Undergraduates pursuing degrees in Geography, Geology, and Secondary Science Education are also often encouraged to enroll in this course. Soil Resources is a 100-level course offered for all undergraduate students. Prerequisites include high school chemistry or one semester of college chemistry. Graduate-level students in the Applied Science Master's Program and online Agronomy Master of Science Program regularly enroll in AGRO 153 online to fulfill degree

requirements and/or prerequisites. Spring 2020 was my fourth semester teaching the course, with 29 students across 17 majors, most of whom were of junior or senior standing (Figures 1 and 2).

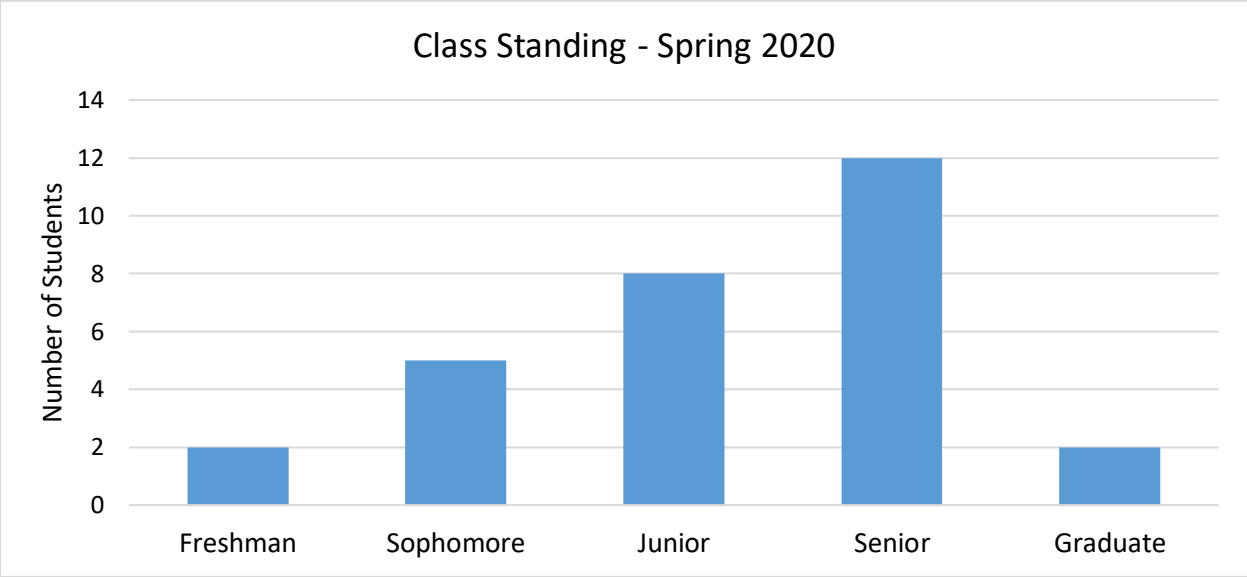


Figure 1. Overview of class standing for enrolled students in AGRO 153 online - Spring 2020.

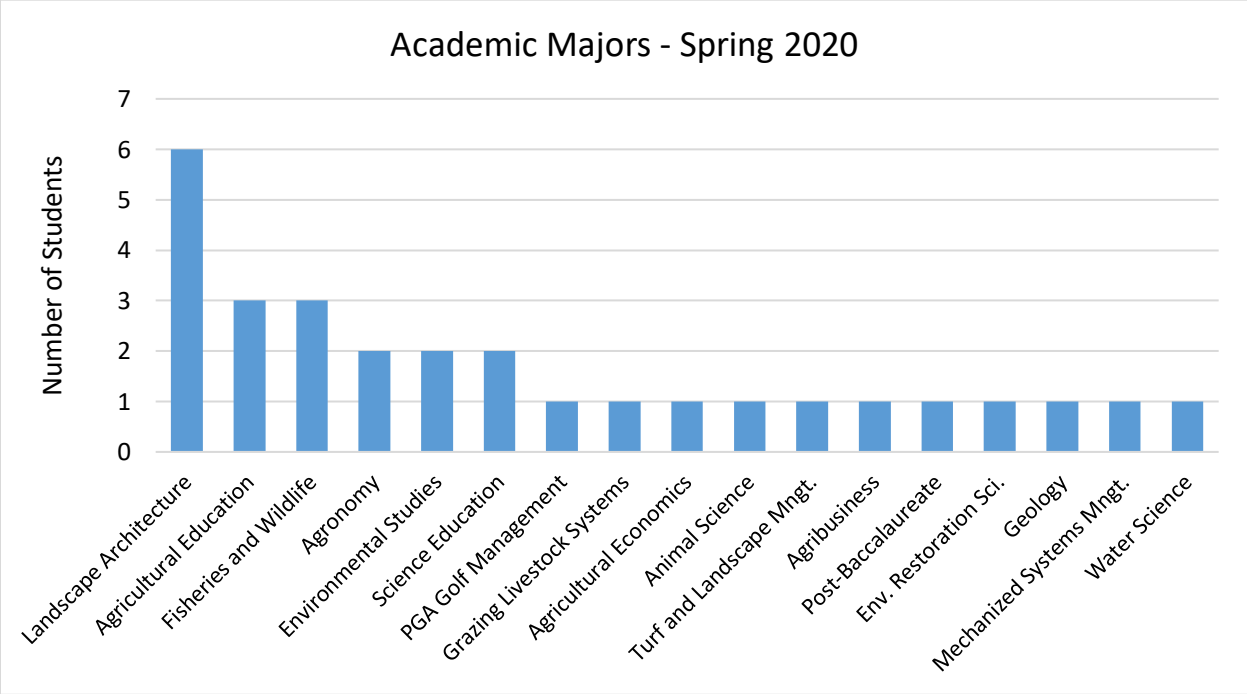


Figure 2. Overview of academic majors for enrolled students in AGRO 153 online - Spring 2020.

A wide-variety of students regularly enroll in this course, both in terms of academic majors, future career plans, backgrounds, and hometowns. Soil Resources is a course that provides students with the opportunity to not only learn basic soil science concepts, but also broaden their understanding in how soils influence natural ecosystems and altered agricultural systems and the multitude of interconnections between them. This allows the students to develop an appreciation for soil systems and the natural world, as well as for future professional colleagues and collaborators. By encouraging this type of broad systems-thinking approach to Earth systems, students are leaving their departments, colleges, and the university as more marketable professionals and potential graduate students.

AGRO 153 online was chosen for this peer review portfolio because of the diversity in backgrounds, majors, and future career plans associated with the students that take this course. The majority of students start this introductory-level course with the assumption that it will be easy and is not as important or useful as many of their other primary courses, because there cannot possibly be that much to learn about "dirt". The students in this course need to be able to understand basic soil science concepts and their various functions at different scales in the global ecosystem, as much of this knowledge base will be utilized and built upon in many upper-level courses. Much of this course uses templates for materials, content, and assessments that were already in place when I took over the course in Fall of 2018, that have been continually modified and improved with each offering. With AGRO 153 (resident and online) as my primary focus in my current position, I would like to make more conscience and thought-out decisions in changes to content, activities, and assessments in the course that would better reflect the course objects and help the students understand how this course will benefit their lives, professionally and personally, in the future.

COURSE MATERIALS, TEACHING METHODS, AND ACTIVITIES

All course materials for AGRO 153 online were available to students through the Canvas learning management system, with the exception of the required textbook, *Soil Science Simplified, 5th Edition* by Franzmeier, McFee, Graveel, and Kohnke. Course materials included weekly course notes, textbook readings, instructor-created lecture and calculation videos, resource videos and guides, slide decks, virtual lab activities, and self-study worksheets. Old exams from several years ago were also available in two forms - Canvas-based quiz and a Word file - for preparation for each exam.

AGRO 153 online is an online course, so by default, it is student-centered, where I provide the necessary materials and information to facilitate student-driven inquiry. The course is structured into 16, one-week modules, with 12 content weeks and 4 exam weeks, with exams occurring every fourth week. The Canvas course site is organized so that there is a single Canvas module page with the learning objectives, an introduction of the week's concepts and their importance or relevance to soil functions, and lists of READ-WATCH-DO activities for that particular week. Module pages, and the readings and videos, are available several weeks in advance of when they would occur within the semester, but the weekly quizzes and assignmenst are scheduled to only be available or unlocked during the week in which they occur.

A quiz and an assignment are assigned during each content week. The weekly quizzes are completed individually and instructor-reviewed. Commonly missed questions are added to a "muddiest point" course announcement and clarified, and also discussed at beginning of next weekly virtual lab. Students have two opportunities to complete the weekly quiz, so as to review mistakes and concepts, ask questions, and improve score and understanding of the material. These quizzes include multiple-choice, multiple-answer, matching, and true/false style questions to gauge students' ability to understand, remember, and interpret concepts learned that week.

The weekly assignments are also completed individually and graded by the course TA. The TA provides constructive feedback on missed questions and provides the instructor with a list of commonly missed questions or concepts that several students struggled with, to include on the "muddiest point" announcements for clarification. These assignments often include practical problems to apply concepts learned that week (and in previous weeks) to real-world scenarios.

A multiple-choice exam is given every four weeks. The exam is typically proctored through a testing center, though this was not the case for the second two exams of the Spring 2020 semester due to the COVID-19 pandemic. The exams include questions similar to those from the weekly quizzes from the unit, aimed at determining the students' ability to understand and interpret concepts from the previous three weeks, but also include questions that require the students to compare and contrast information from example scenarios and make connections between the concepts covered in the previous weeks.

In Fall 2019, weekly virtual labs were added to the course as a way to improve student engagement and interaction, and to get a better sense of where problems in understanding concepts are earlier in the content week. These were instructor-designed activities with course objectives and learning goals in mind, and administered by the instructor via Zoom. During these virtual labs, students would work collaboratively in a small group to complete problems on worksheets via Google Drive, where they could input information simultaneously and edit each other's work in real-time. Each lab also included a summary activity where the group was posed a set of applied oral questions. These virtual lab activities allow the instructor to assess the

understanding of the class at the group level, assess if there is any glaring confusion or misinterpretation mid-topic, and clarify information for the class as a whole before quizzes or assignments are completed. Seventy-three percent of students surveyed at the end of the Fall 2019 semester indicated that they found the virtual labs beneficial to their overall learning and understanding of the course material, so these virtual labs were included in the Spring 2020 semester as well. Some minor modifications to activities to better fit the time constraints of the labs and focus on topics that students found most helpful to learn or review during these sessions. Students are expected to review the readings and videos assigned that week before the weekly virtual lab. However, currently, there is no mechanism in place for accountability of preparation, and often, many students have not yet started reviewing the week's material. Canvas activity within a given week typically spikes in the 24 hours before the "Friday at Noon" due dates for the weekly quiz and assignment.

A large majority of students that take AGRO 153, resident or the online section, belong to majors within the Department of Agronomy and Horticulture. In Fall 2019, we surveyed students in both sections to evaluate how the course met the broader Departmental student learning outcomes (SLOs). Of the students surveyed in AGRO 153 online, 80-100% agreed that the course met the SLOS within the "Systems" category, and similar results were noted from students surveyed in Spring 2020. The "Systems" SLOs, which directly relate to the first course learning objective, include:

- Understand that plant and soil management is part of a complex system affected by time, space, and ecosystem factors and that these variables affect our ability to sustain production, recreational, and/or other land uses. (100% Fall 2019, 95% Spring 2020)
- Understand the scientific and social factors affecting the resiliency of plant and soil systems. (100% in Fall 2019, 86% Spring 2020)
- Recognize that the overall behavior of a complex system is not predicted by the behavior of individual elements or the sum of all the parts of the system. (80% Fall 2019, 86% Spring 2020)
- Understand the difficulty in managing complex systems. (100% Fall 2019, 95% Spring 2020)

PLANNED CHANGES FOR SPRING 2020

The course modification for Spring 2020 was designed to test if requiring some preparation or content review earlier within a content week, and before the weekly virtual lab, would improve student learning of the course objectives. I had originally planned to do this for two content weeks. I was only able to complete one week as the cancellation of classes for one week and shift to remote instruction for all classes due to the spread of COVID-19 occurred around time I had planned for prep and delivery of the second content week. For this activity, I created a new

instructional lecture video with embedded quiz questions to keep students engaged in their review of the video (Appendix B). When watching the video, students were required to answer four questions at different intervals that reviewed content discussed in the 5 to 10 minutes leading up to that question. The video would only move forward if the student answered the question correctly. If the student responded incorrectly, the video would jump back to a predetermined time step near where that topic or concept was discussed. Optional pre- and post-video surveys were administered to determine the effectiveness of this type of instructional video (Appendix C). The results of these surveys are discussed in the following section, along with student performance on the weekly quiz, weekly assignment, and exam related to the learning objectives studied, and compared to previous semesters.

ANALYSIS OF STUDENT LEARNING

This section of the portfolio will describe the data collected and analyzed to document the effectiveness of including a required interactive lecture video early in a content week on student performance related to course learning objectives. The over-arching learning objective investigated was the second listed on the course syllabus, "describe soil profiles and relate profile characteristics to soil forming factors and processes." Explicit learning objectives within this broader objective were:

- Identify and describe common soil parent materials.
- Identify the forces responsible for transported parent materials.
- Identify and define the five soil forming factors.
- Identify and define the four soil forming processes.
- Describe how each soil forming factor influences soil development.
- Identify the soil forming factor responsible for a given soil characteristic.
- Identify and describe common weathering processes.

Of the 29 students in the course, 21 gave permission to use their assessment information and grades in this portfolio, which is presented as aggregated data compared to aggregated data from previous semesters.

VIDEO AND SURVEY ANALYSIS

Of the 29 students in the course, 19 watched and complete the interactive lecture video. Overall, students performed well when responding to the first two video questions about parent materials, but successfully answering the second two questions correctly on their first attempt decreased (Table 1). The first two questions are designed to fit into the first level of Bloom's Taxonomy, where students are tasked with simple recall of facts and basic concepts, as these facts are both listed as text and orally described within the video. The second two questions fit more into the second level of Bloom's Taxonomy of explaining ideas or concepts, as they are asked to recognize and interpret information presented as descriptive figures of general trends, and relate forming factors to soil development.

Embedded Video Question Results	
Question	% Correct on First Attempt
Alluvium is a transported soil parent material that is deposited by what force? *(water)*	90
Alluvium is commonly found in valley bottoms and channels on the landscape, so it is likely deposited by/in … *(streams (flowing water))*	100
Soils in which type of climates tend to have the deepest development and highest rates of weathering? *(warm and wet)*	77
Due to higher rates of erosion and steep slopes, the shallowest soils tend to occur on this part of the landscape … *(backslope)*	63

Table 1. Correct responses to interactive video questions. Correct answers are in parentheses following the question.

Results from the optional pre- and post-video surveys are listed in Table 2 on the following page. Of the 19 students that watched and completed the interactive lecture video, 17 completed the pre-video survey and 15 completed the post-video survey. On the pre-test, about 41% of students answered three of the four questions correctly, with the vast majority indicating that they were not confident in their responses. The remaining question was answered correctly by about 65% of students, with only 35% indicating they were not confident in their response. Confidence levels increased markedly for the all post-video survey responses, and correct responses increased to about 87% to 100% for three of the four questions. Response accuracy

Survey Results Comparison				
Question	Pre-Survey		Post Survey	
	% Correct	Confidence	% Correct	Confidence
The type of parent material that accumulates at the base of slopes due to the force of gravity is called _____. *(colluvium)*	41.2% correct	5.9% confident	100% correct	78.6% confident
	58.8% incorrect	11.8% neutral	0% incorrect	21.4% neutral
		82.4% not confident		0% not confident
Parent material which is inorganic and has not been transported (i.e. weathered bedrock) is called _____. *(residuum)*	41.2% correct	17.6% confident	86.7% correct	73.3% confident
	58.8% incorrect	5.9% neutral	13.3% incorrect	20% neutral
		76.5% not confident		6.7% not confident
Refer to the block diagram, which shows the relationships between soil series, parent materials, and relief. Which two soil series are located on the shoulder position of the landscape? *(Hastings and Geary)*	64.7 % correct	41.2% confident	100% correct	66.7% confident
	35.3% incorrect	23.5% neutral	0% incorrect	26.7% neutral
		35.3% not confident		6.6% not confident
Illuviation is an example of which soil forming process? *(translocation)*	41.2% correct	11.8% confident	33.3% correct	40% confident
	58.8% incorrect	29.4% neutral	66.7% incorrect	46.7% neutral
		58.8% not confident		13.3% not confident

Table 2. Pre-video and post-video survey results and comparison of correct responses and confidence level. Correct answers are in parentheses following the question.

decreased somewhat for the last post-video survey question. The concept addressed in the last question, specifically, was both listed as text and orally described within the video, so it was surprising to see a decrease in response accuracy for this particular question. A couple of factors could be influencing this result. This concept was presented within the last few minutes of the interactive lecture video, after the last embedded question, so students may have concluded the video before reaching this topic. Another possibility is that students were confused by the definition of "illuviation", which is the accumulation of material (typically clay) downward in the soil profile. With 53% of the incorrect responses on the post-video survey being "addition", I suspect that students were associating the term "accumulation" with "addition", rather than thinking about the process in more depth. Activities or methods to avoid this type of confusion or misinterpretation in the future could include clarifying statements on not associating accumulation with addition in course notes, module descriptions, and course announcements, as well as a focused oral question on the concept during a weekly virtual lab.

ASSESSMENT ANALYSIS

The Week 2 Quiz, Week 2 Assignment, and Exam 1 are the criteria compared across semesters to determine the impact on student learning by including an interactive lecture video. The Week 2 Quiz and Exam 1 pull questions from larger quiz banks, so no two student quizzes or exams are exactly the same, and not all questions are answered by all students. Questions within these banks are modified each semester to clarify wording, update broken external links, update images with a high-quality version, etc. To avoid potential cheating between semesters, additional questions are added to these quiz banks where the specific question is new, but formatted like existing questions. For example, adding new questions asking the student to identify the transportation mechanism related to a given parent material, but changing the parent material in each question. The ratio of the questions related to the explicit learning objectives listed previously, has not changed on the quiz or exam between semesters. The Week 2 Assignment has been modified slightly each semester to clarify wording, include more explicit instructions and point breakdowns, and format the overall layout of the assignment.

I plotted the average scores and standard deviations for the Week 2 Quiz, Week 2 Assignment, and Exam 1, for the last four semesters (Figure 3). I also completed an Analysis of Variance (ANOVA) test between each of the four semesters for the average scores on each assessment. Overall, there was no statistical difference between semesters for the Week 2 Quiz and Exam 1. However, these was a statistical difference in the Week 2 Assignment between Spring 2020 and all three previous semesters ($F = 17.48$, $F_{critical} = 2.72$, p-value $= 7.64*10^{-9}$). Further analysis

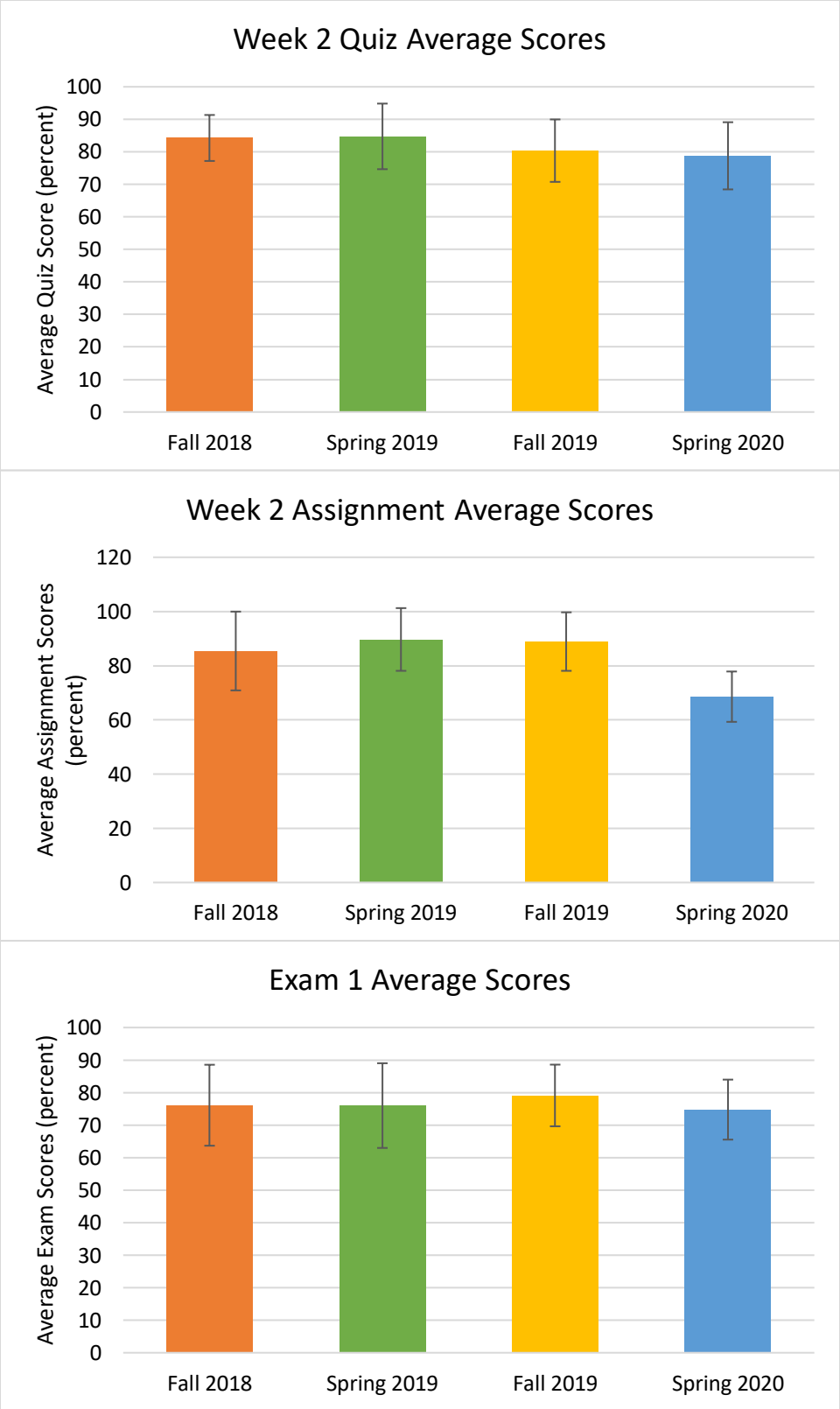


Figure 3. Average assessment scores for each semester.

used a two sample t-test assuming equal variances between the four semesters. The t-tests showed that the Week 2 Assignment average scores were significantly lower than those from Fall 2018 (p-value = $1.64*10^{-5}$), Spring 2019, (p-value = $3.55*10^{-9}$), and Fall 2019 (p-value = $3.99*10^{-8}$). Histograms of grade distributions for these three assessments support this finding as well, showing a shift in the trend of Week 2 Assignment grades to lower categories (Figure 4). These data would suggest that students in the Spring 2020 semester had more difficulty in applying the concepts from the content week to the short-answer, summative assessment, compared to previous semesters. One potential cause for this could be due to this assignment occurring early in the semester, and being the first of its kind in terms of including exercises that focus predominantly on interpreting real-world information and applying concepts. Another potential consideration is that the Spring 2020 group of students started out with less background knowledge in the material covered in Week 2 compared to previous semesters, and thus struggled more with applying the concepts.

Regression analysis does not show any strong relationships between each of the assessments, or between each assessment and the final course grade (Figure and Figure 6, respectively). No strong relationships were found between pre- and post-video survey performance and each assessment or the final course grade either (Figure 7). So, students who do well on the Week 2 Quiz or Assignment, may not perform as well on the Exam, and vice versa. Also, students who show improvement on the pre- and post-video surveys may not score higher on these assessments, or have a higher final course grade, and vice versa.

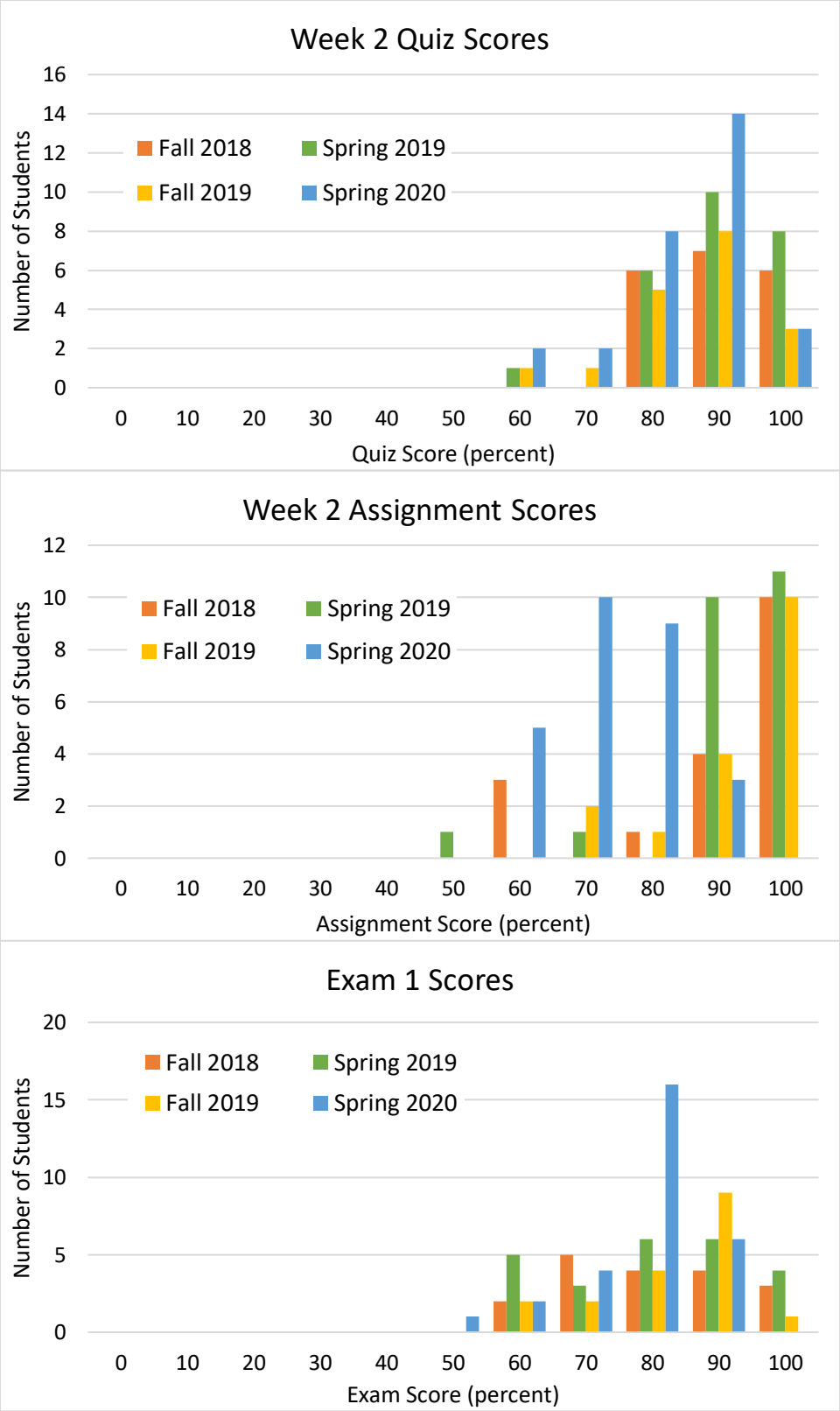


Figure 4. Distribution of assessment scores for each semester.

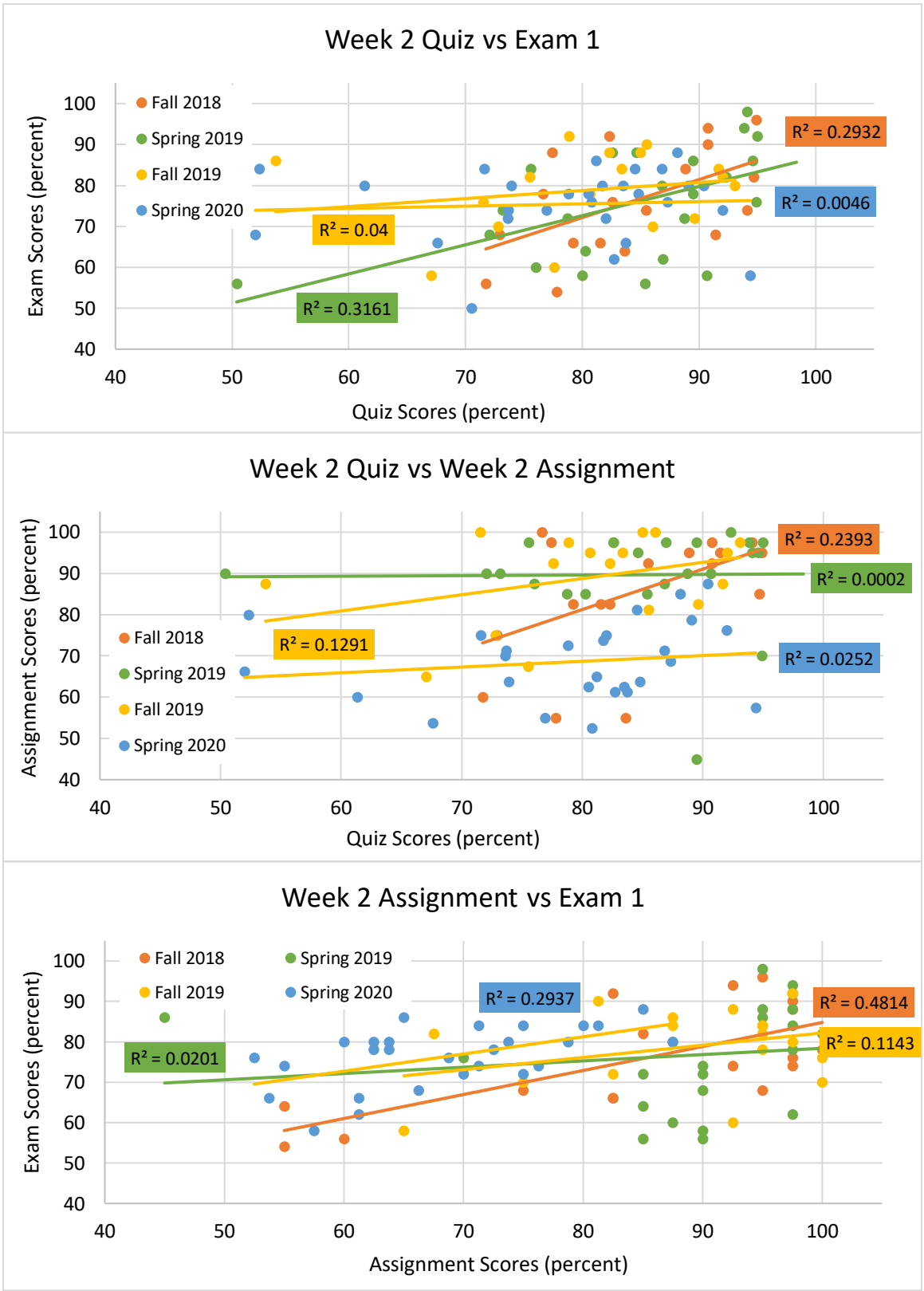


Figure 5. Regression plot comparisons of the three assessments investigated.

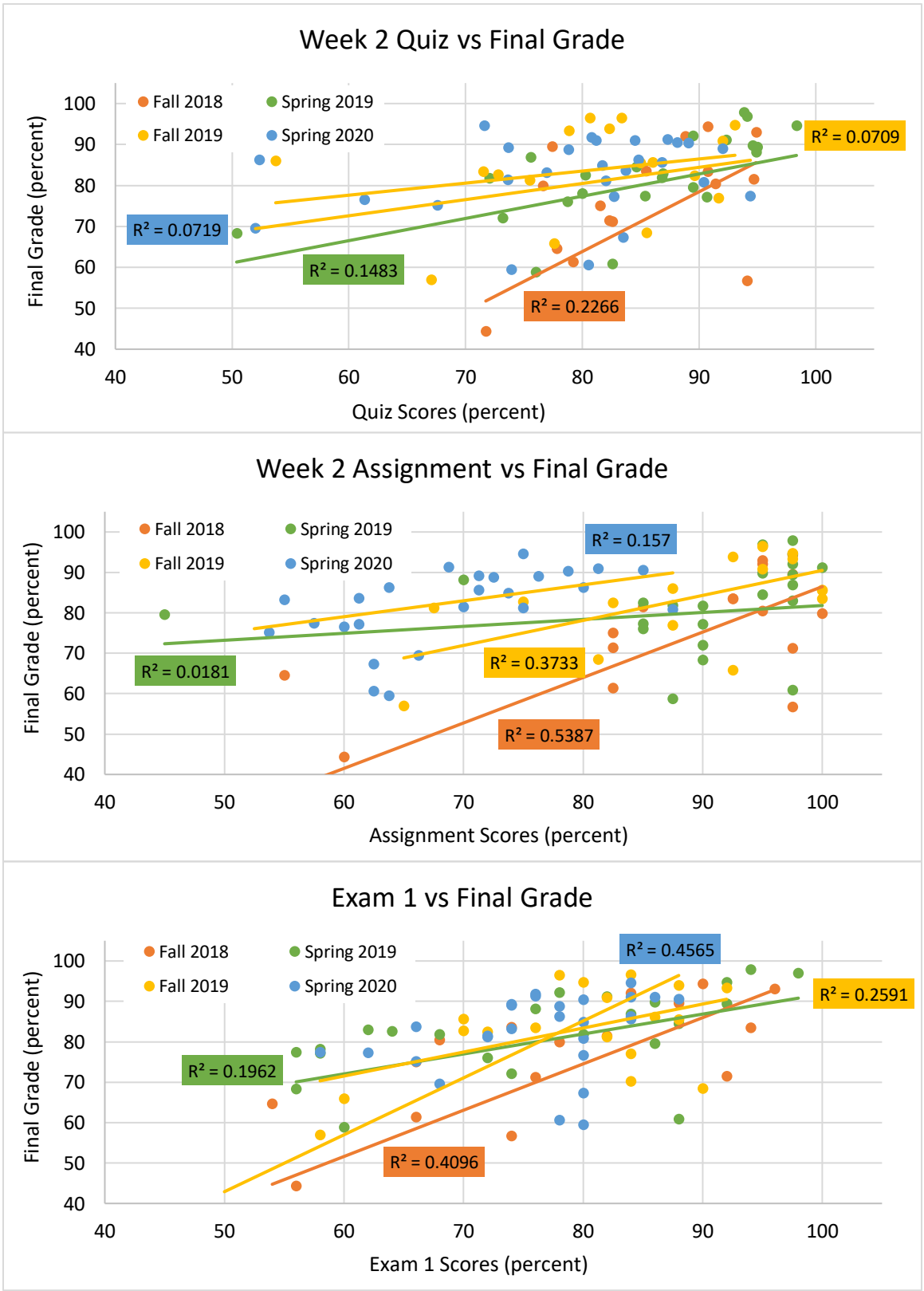


Figure 6. Regression plot comparison of assessment performance to final course grades.

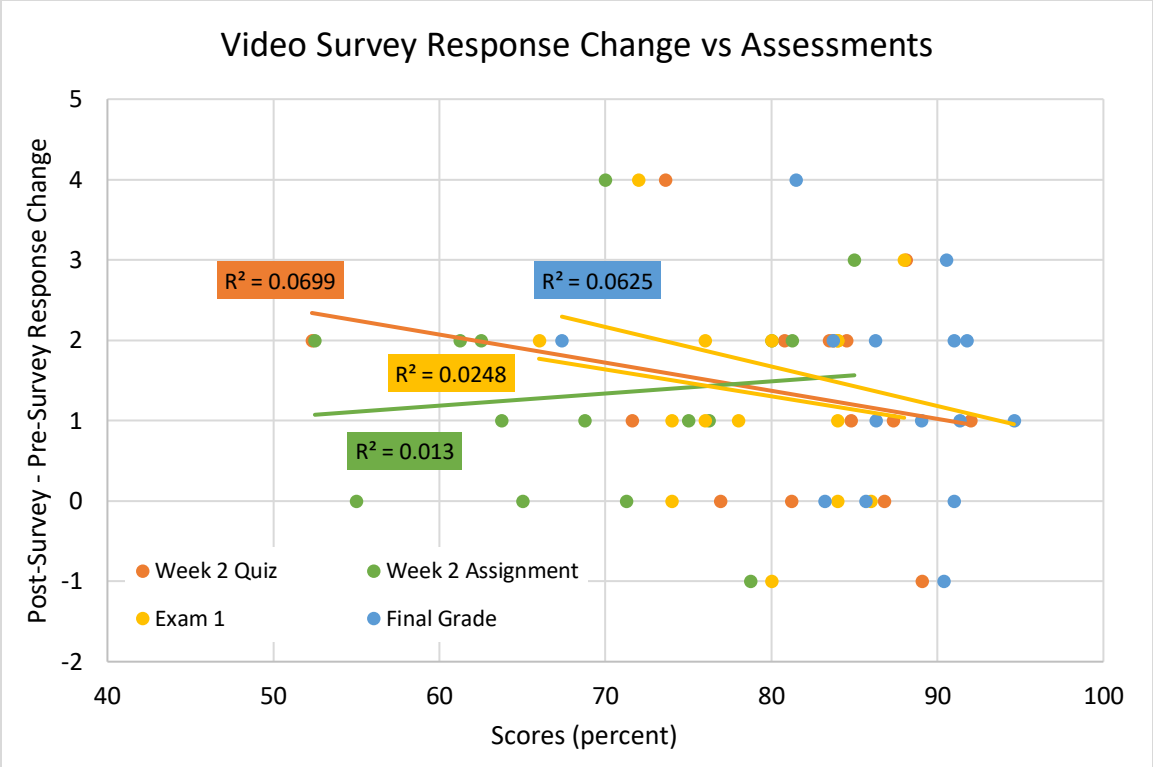


Figure 7. Regression plot comparison of assessment performance and final course grade to correct response change between post-video and pre-video surveys.

PLANNED COURSE IMPROVEMENTS and REFLECTION

As a result of the findings discussed in this portfolio, and general observations over the course of the semester, I plan to make several modifications to AGRO 153 online for future semesters, to improve long-term retention and understanding of concepts and ability to apply concepts to practical scenarios. I plan to continue analyzing student learning and performance in future semesters to determine if more rigorous scheduling of requiring the review of content materials earlier in the week and the overall effects of synchronous and asynchronous interactive activities in an online course. My planned course improvements for future semesters include:

- Provide an example assignment to demonstrate expectations of responses for applied, short-answer questions on the first summative assessment.
- Design weekly quizzes and unit exams with a few "indicator" questions that are the same on all quizzes/exams, for all students, to better track and compare performance related to key learning objectives and course concepts.
- Continue with interactive lecture videos. With this, I plan to reduce the overall video time, which would increase the number of overall videos. I also plan to include more applied questions within the videos.
- Incorporate an asynchronous trivia-style quizzing tool, such as Kahoot! ©, which would be required to be completed before attending the weekly virtual lab, to encourage preparation and activities and create a more formal method of accountability.
- Modify the structure of virtual labs to require students to complete an activity on their own and bring their results to the weekly virtual lab. This method would shift the focus of the virtual lab from learning new topics or concepts to review of the concepts, and allow more time for group discussion and working through additional applied oral questions.

I am grateful to have had the opportunity to take part in the Peer Review of Teaching Project. Having dedicated time to listen to the past experiences of other faculty, as well as have constructive conversations with fellow first-year participants about our own projects, was incredibly helpful in avoiding potential pitfalls and figuring out ways to analyze student learning. Having had the opportunity to also work with an advanced participant on their project within my resident section of this course, was also helpful in learning how to better organize and structure my activities to develop a more formal project for publication.

Appendix A - AGRO 153 Online Syllabus

SOIL RESOURCES – SPRING 2020
AGRO/HORT/SOIL 153-700 Online

OVERVIEW

Soils are rich ecosystems, composed of living and non-living matter that are in constant dynamic interactions. Soils play important roles in many **ecological cycles** (e.g. carbon, water, and nutrient cycles), and also provide additional benefits called **ecosystem services**. These **ecosystem services** include supporting plant growth, waste decomposition, water filtration system, and degrading environmental contaminants.

COURSE GOALS

The learning objectives are for students to be able to:

1. Explain the multiple functions of soil in the global ecosystem and how land use and/or management may impact soil functions and soil erosion.
2. Describe soil profiles and relate profile characteristics to soil forming factors and processes.
3. Describe soil physical properties of texture, structure, density, porosity and relate these to soil water holding capacity, plant available water, and infiltration.
4. Describe soil chemical properties of clay and organic colloids, ion exchange, and acidity, and relate these to soil type and general soil fertility.
5. Classify types of soil organisms and describe their roles in carbon and nitrogen cycles.
6. Illustrate how abiotic and management factors influence ecological cycles of carbon and nitrogen

COURSE TEACHING TEAM

Dr. Rebecca (Becky) Young 362G Plant Science Hall ryoung@unl.edu (402) 472 – 1583 **Office Hours: M 1-3, T 10-Noon, or by appointment (in person or via Zoom)**	Dinesh Panday, TA dinesh.panday@huskers.unl.edu Allison Sheen, TA allison.sheen@huskers.unl.edu

CLASS MEETING TIME

- **Online**: Through Canvas Learning Management System.

REQUIRED COURSE MATERIALS, TEXTBOOK, ETC.

- Soil Science Simplified, 5th ed. 2016. Franzmeier, McFee, Graveel, and Kohnke.
- Computer/tablet & reliable internet connection

COURSE UNITS

The course is divided into five units:

- Unit 1: Soil development and classification
- Unit 2: The soil physical environment
- Unit 3: The soil chemical environment
- Unit 4: The soil biological environment and ecological cycles
- Unit 5: Land use and soil conservation

COURSE GRADING

ACTIVITY	% of total grade
Weekly Online Quiz	20
Weekly Assignment	25
Weekly Virtual Lab	10
Discussions	10
Exams	35

Weekly Online Quizzes (20%): These consist of multiple-choice, fill in the blank, matching questions taken on-line after reading course notes and reviewing recorded lectures. ***Open at noon on Fridays with new content and closes at noon on Friday the following week.***

Exams (35%): The exams will be objective multiple-choice format. Exams will be given every 4 weeks during the semester. See course calendar for test dates. **Exams are administered at the Digital Learning Commons in Love Library on City Campus** – students must sign-up for an exam with the DLC (seats fill up fast, so schedule your exam as early as possible). Remote students that cannot commute to Lincoln for exams should contact the instructor about setting up an exam proctor in their area by then end of the first week of class.

Weekly Assignment (25%): The assignments are designed to enhance application of basic soil principles in real-world field scenarios. ***Open at noon on Fridays and closes noon on Friday the following week.***

Weekly Virtual Lab (10%): Each week students will participate in a virtual lab activity during their designated time via Zoom. The virtual lab will include worksheets and activities that support that week's topics and concepts. Each lab section has a designated Zoom room that they will login into each week, links provided below.

701 - Tuesdays at 4pm CST - Zoom room link: https://unl.zoom.us/s/359160611
702 - Tuesdays at 6pm CST - Zoom room link: https://unl.zoom.us/s/869267571
703 - Wednesdays at 3pm CST - Zoom room link: https://unl.zoom.us/s/821793690

Discussions (10%): A discussion activity will open for each unit, from the start of the unit until and due noon Friday of each exam week. For each activity, students are required to submit at least 3 questions about the muddiest points from that unit, and provide a response or comment to at least 2 posts from other students. Rubrics for asking questions and responding to questions will be provided.

Note – Late submission of any quiz or assignment will receive a 20% deduction on grade. No report will be accepted if it is more than 3 days late and the grade will be entered as zero. Provisions will be made only on a case-by-case basis if previous arrangements were made with the instructors. Late discussion posts will not be accepted.

GRADING SCALE

%	Grade	%	Grade
93 – 100	A	73 – 76	C
90 – 92	A-	70 – 72	C-
87 – 89	B+	67 – 69	D+
83 – 86	B	63 – 66	D
80 – 82	B-	60 – 62	D-
77 – 79	C+	< 60	F

TENTATIVE COURSE SCHEDULE

Week	Dates	Units and Topics
1	1/13 - 1/17	Unit 1: Soils, Humans, and the Environment.
2	1/20 - 1/24	Unit 1: Soil Formation & Profile Development.
3	1/27 - 1/31	Unit 1: Describing the Soil Profile and Soil Classification and Survey
4	2/3 - 2/7	Wrap-Up and Reflection on Unit 1
Unit 1 Exam: Thursday Feb. 6 - Friday Fe. 7 @ UNL DLC Exam Commons (Love Library North)		
5	2/10 - 2/14	Unit 2: Soil Texture and Soil Structure
6	2/17 - 2/21	Unit 2: Soil Color, Temperature, Density, & Porosity
7	2/24 - 2/28	Unit 2: Soil Water
8	3/2 - 3/6	Unit 2: Soil Water & Physical Properties Review
Unit 2 Exam: Thursday Mar. 5 - Friday Mar. 6 @ UNL DLC Exam Commons (Love Library North)		
9	3/9 - 3/13	Unit 3: Soil CEC
10	3/16 - 3/20	Unit 3: Soil Acidity and Salinity
11	3/23 - 3/27	**SPRING BREAK**
12	3/30 - 4/3	Unit 3: Soil Plant Nutrients, Soil Testing & Fertilizers
13	4/6 - 4/10	Unit 3: Soil Chemical Properties Review
Unit 3 Exam: Thursday Apr. 9 - Friday Apr. 10 @ UNL DLC Exam Commons (Love Library North)		
14	4/13 - 4/17	Unit 4: Soil Organisms & Ecological Cycles
15	4/20 - 4/24	Unit 4: C&N Ecological Cycles
16	4/27 - 5/1	Unit 5: Erosion and Land Use
Unit 4 Exam: Wednesday May 6 - Thursday May 7 @ UNL DLC Exam Commons (Love Library North)		

COURSE POLICIES AND PROCEDURES

1. The instructors will be available for questions or advice. You can follow the office hours schedule, make an appointment with the TA or instructor, or email your questions.
2. The instructors may not always answer your questions directly. Instead we may prompt you with additional questions or hints/tips to help you answer your own questions.
3. As instructors, we will support your right to appeal any grading decision or decision not to give a make-up exam. Appeals must be made in writing no later than 24-hr after the graded assignment was returned to you. Your written appeal should include justification.

YOUR Responsibilities

1. Read and review the syllabus so you know the course expectations.
2. Set specific learning and goals for the course within first two weeks of the semester.
3. Worksheets will posted each week as guides to highlight main concepts. Completing these worksheets will help you complete the weekly quiz and weekly assignment.
4. You are responsible for contacting the instructor and/or TA to obtain assistance on concepts/activities that are not clear.
5. Check your email and Canvas **regularly** for message and/or announcements
6. **Cell Phone calculators CANNOT be used during exams**.

MODIFICATION OF COURSE SYLLABUS

The instructors reserve the right to modify and/or change the course syllabus or course calendar as outlined during the semester. The instructors will inform you in class or via email if such modifications/changes are made.

ACADEMIC HONESTY

Each student is expected to follow the code of academic honesty set by UNL in the work submitted to class (Student Code of Conduct, UNL, Section 4.2). Please follow the link below to review the Agronomy and Horticulture Academic Integrity Policy. If you are having problems studying the material, preparing for exams, or assignments, please talk to the instructors. Agronomy and Horticulture Academic Integrity Policy here.

POLICY ON STUDENT ACCOMODATION

Students with disabilities are encouraged to contact the instructor for a confidential discussion of their individual needs for academic accommodation. It is the policy of the University of Nebraska-Lincoln to provide flexible and individualized accommodation to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements. To receive accommodation services, students must be registered with the Services for Students with Disabilities (SSD) office, 132 Canfield Administration, 472-3787 voice or TTY.

APPENDIX B - INTERACTIVE VIDEO QUESTIONS

Interactive Video on Soil Formation (40:09 minutes)

VIDEO QUESTIONS

1. Alluvium is a transported soil parent material that is deposited by what force?
    a. gravity
    b. ice
    c. water
    d. wind
        i. occurs at 16:12, jumps back to 5:56 if answered incorrectly

2. Alluvium is commonly found in valley bottoms and channels on the landscape, so it is likely deposited by/in …
    a. streams (flowing water)
    b. lake environments
    c. coastal environments
        i. occurs at 16:12 immediately after question 1, jumps back to 6:55 if answered incorrectly

3. Soils in which type of climates tend to have the deepest development and highest rates of weathering?
    a. cool and dry
    b. warm and dry
    c. warm and wet
    d. temperate and moist (seasonally warm/cold and wet/dry)
        i. occurs at 24:07, jumps back to 22:35 if answered incorrectly

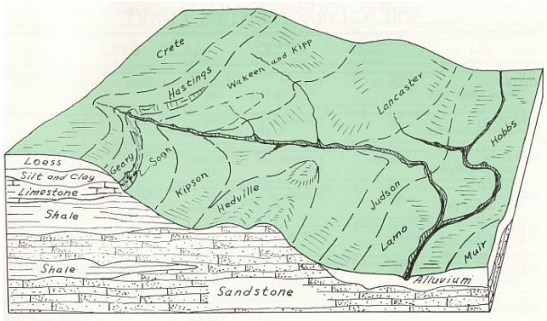
4. Due to higher rates of erosion and steep slopes, the shallowest soils tend to occur on this part of the landscape …
    a. summit
    b. shoulder
    c. backslope
    d. footslope
    e. toeslope
        i. occurs at 32:10, jumps back to 29:59 is answered incorrectly

APPENDIX C - PRE- AND POST-VIDEO SURVEY QUESTIONS

1. The type of parent material that accumulates at the base of slopes due to the force of gravity is called _____. Select your answer below AND select your level of confidence in your ability to answer this question.
    - alluvium
    - *colluvium*
    - eolian
    - lacustrine
    - Confidence Level A - I feel confident that I can answer the question or perform the task indicated correctly.
    - Confidence Level B - I believe that I can now answer 50% of the question correctly.
    - Confidence Level C - I am fairly certain I do not know the correct answer.

2. Parent material which is inorganic and has not been transported (i.e. weathered bedrock) is called _____. Select your answer below AND select your level of confidence in your ability to answer this question.
    - colluvium
    - cumulose
    - loess
    - *residuum*
    - Confidence Level A - I feel confident that I can answer the question or perform the task indicated correctly.
    - Confidence Level B - I believe that I can now answer 50% of the question correctly.
    - Confidence Level C - I am fairly certain I do not know the correct answer.

3. Refer to the block diagram below, which shows the relationships between soil series, parent materials, and relief. Which two soil series are located on the **shoulder** position of the landscape? Select your answer below AND select your level of confidence in your ability to answer this question.



- Crete and Lancaster
- Muir and Lamo
- *Hastings and Geary*
- Kipson and Lanscaster
- Confidence Level A - I feel confident that I can answer the question or perform the task indicated correctly.
- Confidence Level B - I believe that I can now answer 50% of the question correctly.
- Confidence Level C - I am fairly certain I do not know the correct answer.

4. Illuviation is an example of which soil forming process? Select your answer below AND select your level of confidence in your ability to answer this question.

    - Additions
    - Losses
    - *Translocations*
    - Transformations
    - Confidence Level A - I feel confident that I can answer the question or perform the task indicated correctly.
    - Confidence Level B - I believe that I can now answer 50% of the question correctly.
    - Confidence Level C - I am fairly certain I do not know the correct answer.