



FLORIDA
ATLANTIC
UNIVERSITY

COURSE CHANGE REQUEST Graduate Programs

Department Teaching and Learning

College Education

UGPC Approval _____

UFS Approval _____

SCNS Submittal _____

Confirmed _____

Banner Posted _____

Catalog _____

**Current Course
Prefix and Number**

SCE 6151

Current Course Title

Science: Elementary and Middle School

Syllabus must be attached for ANY changes to current course details. See [Guidelines](#). Please consult and list departments that may be affected by the changes; attach documentation.

Change title to:

N/A

Change prefix

From:

To:

Change course number

From:

To:

Change credits*

From:

To:

Change grading

From:

To:

Review [Provost Memorandum](#)

Change description to:

See Attached Academic Service Learning (ASL) certification.

Change prerequisites/minimum grades to:

N/A

Change corequisites to:

N/A

Change registration controls to:

Please list existing and new pre/corequisites, specify AND or OR and include minimum passing grade.

**Effective Term/Year
for Changes:**

Fall 2018

**Terminate course? Effective Term/Year
for Termination:**

Faculty Contact/Email/Phone Susannah Brown sbrow118@fau.edu 297-2635 or David Kumar david@fau.edu

Approved by

Department Chair

Bubara R. Ridner

College Curriculum Chair

F. R. Plow

College Dean

Valerie J. Bristow

UGPC Chair

UGC Chair

Graduate College Dean

UFS President

Provost

Date

10/18/18

11/28/18

11/30/18

Email this form and syllabus to UGPC@fau.edu one week before the UGPC meeting.

Jill Lancieri

From: Barbara Ridener
Sent: Thursday, October 18, 2018 11:47 AM
To: Jill Lancieri
Subject: FW: Checking on SCE 6151 curriculum sent to College of Education GPC
Attachments: SCE 6151 Graduate Course-Change-Request-2018.pdf; SCE6151 ASL.pdf; Signed Signature Sheet for ASL addition to SCE 4113 and SCE 6151.PDF; SCE 6151 ASL Explanation.docx

From: Susannah Brown
Sent: Wednesday, October 17, 2018 4:35 PM
To: Barbara Ridener <BRIDENER@fau.edu>; Paul Peluso <ppeluso@fau.edu>; Susannah Brown <Sbrow118@fau.edu>; Susanne Lapp <Slapp@fau.edu>; Devraj David <david@fau.edu>
Subject: Checking on SCE 6151 curriculum sent to College of Education GPC

Hello All,
Requesting an update on SCE 6151 adding ASL to the course sent on 9/20/18. Dr. Ridener did the curriculum request move to the COE GPC curriculum sub-committee?
Thanks,
Susannah

Dear Colleagues,
As per the Graduate Curriculum Committee guidelines, the procedure for adding Academic Service Learning (ASL) to an existing course includes completing the change existing course form and notating in the Course Description section of the form to see the attached ASL certification. I have completed the form, including a written explanation in a separate file, and updated (highlighted the ASL information in yellow) the syllabus. I have included the signed approval form from Aaron Hackman, Weppner Center. As per the curriculum guidelines prior to submitting to the COE Graduate Curriculum committee, Dr. Ridener sends an email to all chairs asking if there is any conflict. I have included an email message below to help with this process. Dr. Ridener if you need any assistance in this, please email and let me know. After receiving the replies from the COE departments, the form is processed and sent forward to the COE committee. Dr. Lapp, please let me know when to attend the curriculum committee as I will shepherd this course through the process and answer any questions. Thank you for assistance in this matter.

Sample Email for COE Dept. Chairs:

Dear COE Department Chairs:
Academic Service Learning (ASL) is being added to an existing course, SCE 6151, Science: Elementary and Middle School. Please see the attached form, syllabus, ASL signed approval from the Weppner Center, and an explanation/rationale. Please reply either no conflict or conflict (with explanation).
Thank you in advance for your review.

Dr. Susannah Brown
Professor, Art Education
Florida Atlantic University
College of Education
Department of Teaching and Learning
ORCID 0000-0001-7119-3522

Course Title: Science: Elementary and Middle School
Course Number: SCE 6151 (Mixed Online)
Course Section: 002
CRN: 42984
Credit Hours: 3 Semester Hours (Graduate level)
Campus: Davie
Building and Room: ES410 (STEM Education Lab)
Class Day(s) and Time(s): Monday 4:20 PM – 7:00 PM

Instructor: Dr. David Devraj Kumar
Office: ES219
Office Hours: Monday and Wednesday 1:00 PM – 4:00 PM
Phone: 954-236-1044, **Email:** david@fau.edu

Course Description: This course covers contemporary thinking, practices, and research in the teaching of science to elementary and middle school children.

Course Objectives:

1. Students will be able to identify cognitive theoretical bases of child development and learning.
2. Students will be able to demonstrate proficiency in knowledge and understanding of basic science concepts, scientific principles, the nature of science, and goals and objectives of science education.
3. Students will be able to analyze and discuss the advantages and limitations of modern approaches to teaching science in the elementary and middle school settings.
4. Students will be able to demonstrate knowledge and understanding of various hands-on discovery approaches to science teaching/learning, especially guided-discovery teaching/learning.
5. Students will be able to identify skills and strategies important for the development of thinking skills, problem-solving skills, and effective questioning strategies.
6. Students will be able to develop skills necessary for laboratory-based science instruction, and locating and preparing necessary resources and materials.
7. Students will be able to describe ways of incorporating technology into science instruction.
8. Students will be able to describe ways of integrating science with mathematics, social studies, and language arts.
9. Students will be able to describe ways of assessing student performance.
10. Students will be able to develop an understanding of and identify strategies for teaching science to students with disabilities.
11. Students will be able to explore ways of teaching science to students with limited English proficiency, including students of all social and cultural backgrounds.
12. Students will be able to understand the limitations of science and technology.

Academic Service-Learning Statement: This course is designated as an “academic service-learning” course. The assistance you provide to the agency/organization during your academic service-learning (AS-L) experience is a service to the community and will allow you to apply knowledge from the course to local, national, and/or global social issues. Throughout this course you will be participating in AS-L activities while demonstrating civic engagement at campus, local, national, and/or global community levels. You will also reflect on your AS-L experience and the impact on the community as well as your professional development. Academic service-learning notation of hours will post to your transcript with

submission of hours to your faculty instructor. An Academic Service-Learning Student Survey is required to be taken at the end of your ASL project. Please visit the Weppner Center for LEAD & Service-Learning website, www.fau.edu/leadandserve, for the survey link and more information on FAU's Academic Service Learning program.

Assumption of Risk Statement for Student: The student (volunteer) understands that there are certain physical risks inherent in every form of service-learning. The student understands the risks associated with this Academic Service-Learning assignment. The Student nonetheless agrees to assume those risks so as to gain the benefits from participation in this valuable learning experience. The Student hereby releases the State of Florida, the Board of Trustees, Florida Atlantic University and its agents and employees from any and all liability associated with his/her participation in this assignment at Florida Atlantic University.

Course Evaluation Method and Grades:

1. One Week Unit Plan (Five lesson plans on a sequence of related topics): 20% of Final Grade.
Education Majors must earn grade C or higher on this assignment to pass the course. This is a FEAP Critical Assignment. Topic Selection: During class time on Week One, pre-approved topics will be given from the textbook. Students must sign up for the topic of their choice and also for a date to teach their lesson to the rest of the class. Please copy the title of your topic and the page numbers. Must include teaching strategies from the Effective Science Teaching Competencies in the *Selected Lecture Notes*, pp. 35-45. Due Date: The completed lesson plan must be typed or word-processed with 12-point font by the due date. See Topical Course Outline section for the deadline. Once graded, upload your revised lesson plan to by the Due Date. **Follow FAU College of Education Lesson Plan Format.** In addition make sure the following items are addressed in your Lesson Plan. **Your Lesson Plan should incorporate effective instructional strategies discussed in class in addition to complying with the following items from the Florida Educator Accomplished Practice**
Sequences lessons and concepts to ensure coherence and required prior knowledge
(FL-FAU-FEAP-2013.A.1.b)
Models clear, acceptable, oral and written communication skills
(FL-FAU-FEAP-2013.A.2.e)
Employ higher-order questioning techniques
(FL-FAU-FEAP-2013.A.3.f)
Modify instruction to respond to preconceptions or misconceptions
(FL-FAU-FEAP-2013.A.3.d)
Demonstrate Clear Connections to Previous Lessons and concepts rationalizing based developmental and learning theories
Demonstrate Clear Connections to Following Lessons and concepts rationalizing based developmental and learning theories
Identify a Learning Cycle and the steps of the cycle
 - a) Identify a Learning Cycle first. **5E Model**
STEPS – Engage, Explore, Explain, Extend (or Elaborate), Evaluate
 - b) Clearly mark each steps/stages of the Learning Cycle on the left hand margin from Introduction to Closure activities in appropriate stages in your Lesson Plan.Identify three possible Misconceptions of the Scientific Concept
 - a) List three misconceptions in your Concept(s)/Principle(s)
 - b) Integrate each Misconception Listed and a Solution strategy/correct explanation one each in Lesson Introduction, Core Activity and Closure Activity sections

LiveText grades are mostly based on compliance to FEAP in your first submission. Revised grades: Students may submit one corrected lesson plan within week and earn up to half the points they lost on the initial submission. Revised grades will only count towards the student's academic grade. LiveText grades will not be revised.

2. Teaching with the Lesson Plan in a Local K-12 Classroom: 10% of Final Grade.
Students must leverage their Lesson Plans, Teaching Strategy Profiles, and feedback to teach in a local K-12 classroom. Please prepare your own materials, including extras for unforeseen events. You are expected to use safety goggles and proper chemical disposal procedures. Further directions will be given in-class. For Evaluation Criteria See **Appendix A**.
Requires full compliance for credit.
3. Sunscreen Science Research Project (Problem-Based Learning (PBL) Research Project): 20% of Final Grade.
The details of this lab will be discussed in class Part of the Project is conducted at home with the sunscreens available at your home and the UV Detecting Beads provided by the Instructor. The data, that is the pictures/photos of Beads exposed to Sun (UV) light shielded by the different sunscreens will be evaluated in class with the help of peer evaluators. Then you analyze the data, write the report and submit it for evaluation by Due Date. **Appendix B**.
4. Test 1: 20% of Final Grade.
You are responsible for taking All the Tests/Exams and working with the Instructor to make arrangements to take the Missing Test/Exam due to any verifiable documented reasons.
5. Test 2: 20% of Final Grade.
You are responsible for taking All the Tests/Exams and working with the Instructor to make arrangements to take the Missing Test/Exam due to any verifiable documented reasons.
6. Participation, Timeliness and Professional Conduct: 10% of Final Grade.
Please refer to the General Classroom Policies for details. Full credit requires participation (individual and group discussion, in-class and Canvas), timeliness and professional conduct, and wearing Safety goggles during hands on activities. Homework Assignment is also part of participation. Every homework is due the next class. For Video Lab and related Home Work involving Classroom Video Analysis of Science Teaching the Scheme in **Appendix C** is used with appropriate modifications as suggested by the Course Instructor.
7. Attendance and Grade: Missing more than two class meetings (in-person or Canvas) will result in your final grade being lowered by one grade level. Coming to class late by 15 minutes will result in half-day class attendance. You are responsible for signing your attendance sheet which will be made available in the table in front of class. You are responsible for providing verifiable documented support (e.g., doctor's note, etc.) for excuse from this policy.
8. **OPTIONAL VOLUNTEER SCIENCE MUSEUM PROJECT FOR EXTRA CREDIT – Museum of Discovery and Science (MODS), Fort Lauderdale, FL Informal Science Lesson Plan Presentation: Upto 3% added final grade. Require full compliance for credit. Also, you are eligible for 10 hours of academic service credit after completing this volunteer project. **Appendix D**.**

NOTE: Topic for this Informal Lesson developed based on Informal Science Education Resources such as the Science Museums must be different from the topic you chose for the "Formal" Science

Lesson Plan in class. Those students who have previously participated in this project as part of SCE 4350/SCE 4113 are eligible to participate only if they select a newer exhibit with different science content. **See Appendix D for details.**

Required Texts/Readings

Text Book:

Contant, T. L., Tweed, A. L., Bass, J. E., and Carin, A. A. (2018). *Teaching Science Through Inquiry Based Instruction*. (Thirteenth Edition.). New York: Pearson.

Required Class Packet:

Selected topics from Kumar, D. D. (2017). *Science Education: Selected Lecture Notes and Resources*. Davie, FL: Florida Atlantic University. [Link to the Notes will be Made Available by Email OR on your course Canvas site.](#)

NOTE: The *Science Education: Selected Lecture Notes and Resources* often referred to as “Lecture Notes” in this syllabus are provided free of cost to students enrolled in SCE 4350, should not be copied, duplicated, distributed and/or stored in any medium without the written permission of the author.

Required Instructional Technology Resources:

- A. BAKING SODA REACTION http://www.coe.fau.edu/faculty/david/CD1_BSREACTS.html
- B. MYSTERY LIQUIDS http://www.coe.fau.edu/faculty/david/CD1_MYSTLIQ.html
- C. CONDUCTION <http://www.coe.fau.edu/faculty/david/videos/conduction/conduction.html>
- D. LEMON BATTERY http://www.coe.fau.edu/faculty/david/CD2_LEMBAT.html
- E. EVAPORATION <http://www.coe.fau.edu/faculty/david/videos/evaporation/evaporation.html>

NOTE: These videos are copyrighted. They are provided for enriching your learning experience in this class. Please do not download or copy these materials.

Required Critical Assignments Reporting Resource – LiveText:

Students in this course are required by the COE to have an active LiveText account to track mastery of programs skills, competencies and critical assignments and to meet program and college accreditation requirements. Students must have an account within: the first four (4) weeks of the fall or spring semester, within the first three (3) weeks of summer session, or after the first class of a fast track course. Students who do not have an active LiveText account may have an academic hold placed on their record.

Information regarding account activation is provided on the COE website, <http://coe.fau.edu/livetext>

NOTE: Corrected Critical Assignments must be revised and uploaded to LiveText within two weeks of receiving the corrected lesson plan. In light of the implementation of new, required state standards, the Competency Assessments and rubrics within this course may change during the semester. If changes are made, you will receive advance notification.

Safety Goggles:

Required to have a pair of safety-goggles in person in every class meeting.

General Classroom Policies

Participation, Attendance & Make-up Policy: Students are expected to attend all of their scheduled University classes and to satisfy all academic objectives as outlined by the instructor. The effect of

absences upon grades is determined by the instructor, and the University reserves the right to deal at any time with individual cases of nonattendance.

Students are responsible for arranging to make up work missed because of legitimate class absence, such as illness, family emergencies, military obligation, court-imposed legal obligations or participation in University-approved activities. Examples of University-approved reasons for absences include participating on an athletic or scholastic team, musical and theatrical performances and debate activities. It is the student's responsibility to give the instructor notice prior to any anticipated absence and within a reasonable amount of time after an unanticipated absence, ordinarily by the next scheduled class meeting. Instructors must allow each student who is absent for a University-approved reason the opportunity to make up work missed without any reduction in the student's final course grade as a direct result of such absence.

You are responsible for materials covered during missed class(es). If you need help with materials covered during missed class(es) please ask the Instructor for help or fellow students for notes, help, etc. There is no excuse for not taking a test or completing an assignment on a due date, other than for university approved reasons and/or extenuating circumstances, because you were absent when the topic represented on the test and/or assignment was taught.

Late Work: Assignments are due on or before the deadline. Any work for reasons not mentioned above handed in late will be automatically lowered by 10% grade per week, unless produced with documented and/or verifiable proof of the reason for the delay such as participation in university approved activities and religious observance, and extenuating circumstances. The same applies to Tests. You are responsible for taking All the Tests and working with the Instructor to make arrangements to take the Missing Test(s). The Instructor is not responsible for providing reminders on missed tests, assignments and projects.

Deadlines: You are responsible for meeting deadlines. The Instructor is not responsible for giving reminders.

Academic Honesty: Using work written by someone else including borrowing from students previously or currently in this course is considered dishonest. Students producing dishonest assignments will receive zero grade for that assignment and "fail" the course. The FAU honor code policy statement applies to this course. The Instructor reserves the right to require students to submit written assignments through any FAU approved quality control software available on the FAU Canvas and LiveText.

Honor Code Policy Statement: Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty, including cheating and plagiarism, is considered a serious breach of these ethical standards, because it interferes with the University mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the University community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see

http://www.fau.edu/regulations/chapter4/4.001_Code_of_Academic_Integrity.pdf

Academic Irregularities Including Plagiarism:

"FAU has an honor code requiring a faculty member, student, or staff member to notify an instructor when there is reason to believe an academic irregularity is occurring in a course. The following constitute academic irregularities.

- a. The use of notes, books, or assistance from or to other students while taking an examination or working on other assignments unless specifically authorized by the instructor - acts defined as cheating.
- b. The presentation of words or ideas from an existing source [including the Internet] as one's own - acts defined as plagiarism.
- c. Other activities that interfere with the educational mission within the classroom."

The instructor's penalty for academic irregularities is a grade of "F" in the course. The university may impose a penalty of "academic discipline." Instructors may use electronic media and websites to detect plagiarism.

Classroom Etiquette Policy: Audio, video and any other electronic recording of any classroom discourse is not allowed. This is mainly to comply with the copyrights of various multimedia materials used in this course. "In order to enhance and maintain a productive atmosphere for education, personal communication devices such as pagers, beepers and cellular telephones are to be disabled in class sessions." Disruptive behaviors such as chatting, doing non-science methods course related assignments, cell-phone use, text-messaging, web-browsing (PC/laptop, cell/i-phone/smartphone), etc are not allowed during class. No cell phone/laptop and calculators allowed during Tests. Disruptive behaviors such as chatting, doing non-science methods course related assignments will result in significant participation point deduction. During Tests seat yourself in alternate seats.

Disability Policy: "In compliance with the Americans with Disabilities Act Amendment Act 2008 (ADAAA), students who require reasonable accommodations due to a disability to properly execute coursework must register with the Student Accessibility Services (SAS)—in Boca Raton, SU 133 (561-297-3880); in Davie, LA 131 (954-236-1222); or in Jupiter, SR 111 (561-799-8585) —and follow all SAS procedures."

Counseling and Psychological Services (CAPS) Center: Life as a university student can be challenging physically, mentally and emotionally. Students who find stress negatively affecting their ability to achieve academic or personal goals may wish to consider utilizing FAU's Counseling and Psychological Services (CAPS) Center. CAPS provides FAU students a range of services- individual counseling, support meetings, and psychiatric services, to name a few offered to help improve and maintain emotional well-being. For more information, go to: <http://fau.edu/counseling>

Grading Scale (%)

Grading will be based on a varied spectrum of activities, skills, and understandings. The FAU grading scale is as follows:

A (93-100); A- (90-92); B+ (87-89); B (83-86); B- (80-82); C+ (77-79); C (73-76); C- (70-72); D+ (67-69); D (63-66); D- (60-62); F (0-59)

Homework Assignments and Assignments on Canvas: For homework assignments requiring students to respond via Canvas, it is the responsibility of the student to comply in a timely manner. Homework turned in late will not receive the participation credit.

Incomplete Grade: To receive a grade of incomplete (I) you must consult with the Instructor, and complete and sign the Incomplete Grade Form before the last day of the regular class meeting. Also, you must provide documentary evidence leading to your request for an incomplete.

Missed Science Research Lab and Homework: It is impossible to re-run a Lab. On occasion it may be possible to make arrangements to conduct a make-up lab conditional upon the availability of time, space and appropriate personnel to supervise the student. Instructor is under no obligation to create this opportunity for make-up work. You may turn in missed/late homework for partial credit.

Revising an Assignment for Regrading (This does not include homeworks, research projects, labs, tests, and any extra-credit assignments): You are allowed to revise the Lesson Plan for regrading only once and may earn up to 50% of the grades you lost on the first submission. If you failed a critical assignment you failed the course. For regarding, along with the revised assignment you must submit the original graded assignment and accompanying graded rubric.

Safety: The student is responsible for wearing safety goggles during hands-on activities. Safety goggles are available in the FAU Davie Book Store. The course instructor is not responsible/liable for failed experiments/demonstrations and/or injuries/accidents during experiments/demonstrations both indoors and outdoors. For recommended Dress Code in Science Labs please visit:
<http://www.science.fau.edu/chemistry/chemlab/General/safety.html#DRESS>

Writing Assistance: Students are encouraged to utilize the Writing Center's free assistance. If in the judgment of the Instructor the student's written assignment needs writing help, it is the student's responsibility to contact the Center and to obtain the necessary assistance. The Instructor will not grade the student's assignment until this requirement is met and the student produces a letter from the Center official.

Written assignments: Submit all assignments (first submissions and revisions) on non-spiral letter size paper, hard copy, double-spaced, 12 font size, either typed or word-processed. Please do not use paper clips. Use staples. No plastic covers and jackets, please. The course instructor is not responsible for providing office supplies. The Instructor reserves the right to require you to submit your assignments via Turn-It-In in Canvas.

Course Topical Outline (Tentative)

January 8

Introduction

Lab Safety

Read **Chapter 1 – Science and Science Education**

Assignment: Post Chapter 1 Summary on Canvas by Weekend. Do Not summarize Power point.

January 15

MLK Birthday Holiday

Assignment:

Read:

- The Next Generation Science Standards Executive Summary
<https://tinyurl.com/ngssexecutivesummary>
- Science Education in the 21st Century
<https://tinyurl.com/science-ed21>
- How to Read the Next Generation Science Standards
<https://tinyurl.com/howtoreadngss>
- A New Vision for Science Education
<https://www.nextgenscience.org/sites/default/files/resource/files/NewVision.pdf>

Watch the following videos:

Importance of the Next Generation Science Standards

<https://www.nextgenscience.org/resources/video-importance-next-generation-science-standards>

First Steps Towards Transitioning to the NGSS

<https://www.nextgenscience.org/resources/video-first-steps-towards-transitioning-ngss>

January 22 – Face to Face

Lesson Planning

Read Lesson Planning, pp. 28-31 under Effective Science Teaching Competencies pp.27-45 in *Selected Lecture Notes*

Lesson Unit Discussion

Lesson Unit Topic Selection

Ideas for Writing a Science Lesson Unit Plan

Hands on Science Activities

January 29

Read Chapter 2 – Getting Ready for Inquiry Instruction

Read **Models of Instruction** pp.22-23 from *Selected Lecture Notes*

Read Discovery Learning, General Pattern of Discovery Learning and Types of Discovery Learning from *Selected Lecture Notes*, pp.23-26

Assignment: Compare Evaporation video and Conduction video posted on Week 1 under Videos using the Models of Instruction, identify which one is Rote/Reception which one is Meaningful/Discovery, and email via Canvas your evaluation.

February 5

Read Chapter 3 – Creating a Positive Classroom Environment

Also, Read *Science Fair Projects* (p. 168-169 & Figure 7.21)

Read Counterintuitive Demonstrations (Discrepant Events), *Selected Lecture Notes*, pp. 12-16

Assignment: Explain the science behind any FIVE counterintuitive demonstrations #13-25 on p.15 in *Selected Lecture Notes* and submit your responses via Canvas

February 12

Read Chapter 4 – Learning Science with Understanding

Read Misconceptions - *Selected Lecture Notes*, pp. 31-34.

Write your responses with explanation to each Examples of Common Misconceptions (K-9), pp.32-34 and submit your responses via Canvas

February 19

Read Chapter 5 – Engaging in Inquiry-Based Instruction and Using the 5E Model

Assignment: Compare Evaporation video and Conduction video posted on Week 1 under Videos using the General Pattern of Discovery Learning (*Selected Lecture Notes*, pp.23-26) and email via Canvas your evaluation.

February 26 – Face to Face

TEST 1

Read Effective Science Teaching Strategies, *Selected Lecture Notes*, pp-35-45

Hands on Science Activities

Plan for Sunscreen Science Research Project

Read **Sample Research Project Report** posted on Week 1

March 5-11 - Spring Break

Continue to work on your Lesson Plan

March 12

Read Chapter 6 – **Effective Questioning**

Read **Convergent and Divergent Questions** posted on Week 1

Read **Why Teachers Ask Questions** posted on Week 1

DUE: Lesson Plan

March 19 – Face to Face

Read Chapter 7 – **Assessing Science Learning**

Read **Assessment**, *Selected Lecture Notes*, pp.61-62

Read **Ideas for Assessing Laboratory Activities**, *Selected Lecture Notes*, pp. 63-65

Review **Models of Instruction** pp.22-23 from *Selected Lecture Notes*

Review Discovery Learning, General Pattern of Discovery Learning and Types of Discovery Learning from *Selected Lecture Notes* pp.23-26

Assignment: Compare the Conduction video and Lemmon Batteries video posted on Week 1 under Videos using the Models of Instruction and email via Canvas your evaluation. Which one is Guided Discovery and which one is Modified Discovery and Explain why based on *Selected Lecture Notes* pp.23-26

Hands on Science Activities

March 26

Read Chapter 8 – **Technology as Tool**

Read **Effect of a Problem Based Simulation on the Conceptual Understanding of Undergraduate Science Education Students**, *Selected Lecture Notes*, pp. 134-141.

Assignment: Write a short paper on how you would apply such Problem Based Learning to your Teaching? Submit your report via Canvas.

DUE: Revised Lesson Plan if you are revising it along with the First Graded Lesson Plan and the Evaluation Rubric with grades and feedback.

April 2

Read Chapter 9 – **Connecting Science with Other Subjects**

Read **Teaching Integrated Science and Mathematics**, *Selected Lecture Notes*, pp. 76-77.

Read **Pendulums** *Selected Lecture Notes*, pp. 78.

Read **Bottle Curve** *Selected Lecture Notes*, pp. 79.

Read **Sugar Cubes** *Selected Lecture Notes*, pp. 80.

April 9 – Face to Face

Sunscreen Science Research Project Photo Evaluation – Bring your Sunscreen Science Research Project Photos for PEER EVALUATION to generate Data for your Research

Hands on Science Activities – Pendulum Activity

Continue: Connecting Science with Other Subjects – Science and Math

DUE: All LESSON PLANS UPLOADED TO LIVE TEXT

April 16

Continue: Connecting Science with Other Subjects – Science and Language

Read Creativity, Synectics, Synectics Techniques, Syntus in Science, *Selected Lecture Notes*, pp. 71-75

Assignment: Write your original Syntu on any science topic of your choice using the procedure on *Selected Lecture Notes*, p. 75, and submit your Syntu via Canvas.

DUE: Teaching with the Lesson Plan in a Local K-12 Class Room FORM LETTER SIGNED BY THE CLASSROOM TEACHER and YOUR SELF-REFLECTION

April 23

Read Chapter 10 – Making Science Accessible for All Learners

DUE: Sunscreen Science Research Project Report

DUE: Optional Volunteer Science Museum Project for Extra Credit REPORT FROM THE MODS CONTACT, COPY OF LESSON PLAN CREATED FOR THE MODS and SELF-REFLECTION

April 30 – Face to Face

TEST 2

Teaching in a Local Classroom**Procedure**

- 1) **See Syllabus for the Deadline.**
 - 2) Receive a Letter of Introduction from the course Instructor
 - 3) Teach the lesson plan you developed for SCE 4350 in a local K-8 classroom
NOTE: You must teach the lesson plan to your peers in SCE 4350 also. Make sure you have the necessary clearance from the School Board
 - 4) Engage students in hands-on learning
 - 5) Have the classroom Teacher complete, sign and date the Classroom Teacher portion of the Introduction Letter above
 - 6) Submit the following to the course Instructor Dr. Kumar. **See Syllabus for the Deadline.**
 - 1) Introduction letter with ORIGINAL signature of the Teacher
 - 2) Self Reflection
 - 3) Submit 5 volunteer hours to Academic Service Credit
- (Requires full compliance for credit.)

Assumption of Risk Statement for Student: The student named above understands that there are certain physical risks inherent in every form of service-learning. The student understands the risks associated with this Academic Service-Learning assignment. The Student nonetheless agrees to assume those risks so as to gain the benefits from participation in this valuable learning experience. The Student hereby releases the State of Florida, the Board of Trustees, Florida Atlantic University and its agents and employees from any and all liability associated with his/her participation in this assignment at Florida Atlantic University.

SELF-REFLECTION – Teaching in a Local Classroom

Your Name:

Course:

Semester:

Title of your Lesson Plan:

Grade Level of Classroom:

Name of School:

Name of Classroom Teacher:

Reflecting upon your experience in this Teaching, explain the following.

- 1) Describe any effect on your level of understanding of the Science Concept/Principle you addressed
- 2) Describe any effect on your level of confidence in explaining the Science Concept/Principle you addressed
- 3) Describe any effect on your ability to relate science to real-world examples
- 4) Describe any Effect on your ability to teaching science
- 5) Describe any effect on your decision to become a Teacher

SUNSCREEN SCIENCE RESEARCH PROJECT

Purpose: The purpose of this project is to determine which brand of sunscreen blocks UV rays the best.

1. **Background research:** (1) Description/definition of scientific concepts /principles related to the project (**Cite References**). (2) In addition, Review **three** Sunscreen experiments conducted and posted by school and/or college teachers and for each address: What the researchers did? How did they do the research? What did they find out? (NOTE: Contact the FAU/BC Library for assistance with locating three Sunscreen experiments posted by school and/or college teachers. (**Cite References**))
2. **Hypothesis:** Sunscreen Brand A/B/C will block the most UV rays.
3. **Variables:**
 - a. Independent Variables- The Brands of Sunscreens (A, B, C) used
 - b. Dependent Variable- The color of the UV Detecting Beads String Photos as ranked 1-5 (Likert Scale)
 - c. Constant- Amount of Sunscreen used (1 tea spoon) each trial, Surface Background (white sheet 8.5 x 11) paper where UV Beads and Sunscreen set up was exposed to sunlight each time, Amount of time of each exposure (15 seconds), Location where the UV Beads and Sunscreen set up was exposed to sunlight, Time of day of the experiment.
4. **Materials:** 3 Brands of Sunscreens, 1 UV Detecting Beads String, 3 Tea spoons, 9 Sandwich Bags, 9 Background (white 8.5 x 11 sheet) papers, Timer, Digital Camera (e.g., Cell. iPhone camera), Marker
5. **Step by step directions (On a sunny day after protecting yourself as needed and appropriately for sun exposure...)**
 1. Label 1 sandwich bag (A1) for Sunscreen Brand A.
 2. Place the UV Detecting Bead String inside the labeled sandwich bag.
 3. Place 1tbs of Sunscreen Brand A and coat one side of the sandwich bag.
 4. Bring the labeled sandwich bag (with UV Beads String inside) outdoors to the direct sunlight with the Sunscreen side facing up the sun.
 5. Place it on a white (8.5 x11) sheet of paper on a flat surface exposing to the sun.
 6. Record changes to the color of the UV Beads String after 15 seconds in direct sunlight by Taking a picture of the UV Beads String (within the bag).
 7. Repeat steps 1-6 for Sunscreen Brand A two more times
 8. Repeat steps 1-7 for Sunscreen Brand B and Sunscreen Brand C
 9. Bring 9 photos (A1-3, B1-3, C1-3) to class for peer ranking (1-5 Likert scale)
 10. Calculate the Average Rank for each Sunscreen Brand

1. **Data table**

Trials	Rank of UV Detecting Bead Photo (1-5)		
	Brand A	Brand B	Brand C
1.			
2.			
3.			
AVERAGE:			

2. **Bar graph:** X axis- Brand of Sunscreen, Y axis- Average Rank
3. **Conclusion**
4. **Bibliography:** list all references cited in the text

Video Analysis - Science Teaching

NOTE: Must provide thoughtful in depth responses. Responses such as agree/disagree, yes/no, true/false type responses will not receive any grade.

Activity:

Review the EVAPORATION classroom video.

<http://www.coe.fau.edu/faculty/david/videos/evaporation/evaporation.html>

AND

Review the CONDUCTION classroom video.

<http://www.coe.fau.edu/faculty/david/videos/conduction/conduction.html>

Then, using the Models of Instruction note in the class Lecture Notes, and General Pattern of Discovery note in the class Lecture Notes and report to me

(1) Which one of the above two videos represents Discovery Learning

AND

(2) Explain why, by basing your rationale/justification on the Lecture Notes

(3) Which one of the above two videos DOES NOT represent Discovery Learning

AND

(4) Explain why, by basing your rationale/justification on the Lecture Notes

Optional Volunteer Science Museum Project for Extra Credit MODS Informal Science Lesson Plan & Presentation

Procedure

- 1) Contact Ms. Summer Scarlatelli through email sscarlatelli@mods.net at the Museum of Discovery and Science (MODS), Ft. Lauderdale, FL to make an appointment.
- 2) One individual complimentary Pass will be provided by the MODS.
- 3) Visit the MODS in Fort Lauderdale, FL.
- 4) Report to Ms. Scarlatelli or her designee.
- 5) Tour the Exhibits.
- 6) Select one Exhibit.
- 7) Discuss the selected exhibit with Ms. Scarlatelli.
- 8) Receive Instruction on that exhibit to Gain understanding of the Science Subject Matter Content of that Exhibit.
- 9) Prepare an Informal Science Lesson. (Topic for this Informal Lesson developed based on Informal Science Education Resources such as the Science Museums must be different from the topic you chose for the "Formal" Science Lesson Plan in class.)
- 10) Present the Lesson to designated MODS student visitors or staff and receive feedback (Need to work with Ms. Scarlatelli.) (Note: Presentation must be completed ahead of the deadline for turning in this Informal Science Lesson Plan.)
- 11) Revise your Informal Science Lesson based on feedback.
- 12) Submit the following to the course Instructor on or before to Dr. Kumar. **See Syllabus for the**

Deadline.

- 1) Informal Science Lesson Plan prepared and used in the MODS project
- 2) Self Reflection
- 3) Submit 10 volunteer hours to Academic Service Credit

(Upto 3% added to final grade. Requires full compliance for credit. Also, you are eligible for 10 hours of academic service credit, and remember to submit your service hours before deadline.)

NOTE: Topic for this Informal Lesson developed based on Informal Science Education Resources such as the Science Museums must be different from the topic you chose for the "Formal" Science Lesson Plan in class. Those students who have previously participated in this project as part of SCE 4350/SCE 4113 are eligible to participate only if they select a newer exhibit with different science content.

Assumption of Risk Statement for Student: I whose name appears above understand that there are certain physical risks inherent in every form of service-learning. I understand the risks associated with this Academic Service-Learning assignment. I nonetheless agree to assume those risks so as to gain the benefits from participation in this valuable learning experience. I hereby release the State of Florida, the Board of Trustees, Florida Atlantic University and its agents and employees from any and all liability associated with my participation in this assignment at Florida Atlantic University.

SELF-REFLECTION – Optional Volunteer Science Museum Project

Your Name:

Course:

Semester:

Title of your Lesson Plan/Presentation:

Description of the Science Concept or Principle:

Description of the MODS Exhibit Used for the Project:

Type of Audience (circle one): K-12 Students OR Adults:

Note: Please attach a Copy of your Lesson Plan to this Self Reflection

Reflecting upon your experience in this project, explain the following.

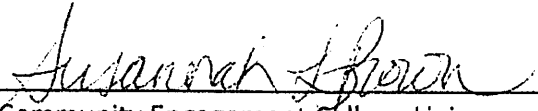
- 1) Describe any effect on your level of understanding of the Science Concept/Principle you addressed
- 2) Describe any effect on your level of confidence in explaining the Science Concept/Principle you addressed
- 3) Describe any effect on your ability to relate science to real-world examples
- 4) Describe any Effect on your ability to teaching science
- 5) Describe any effect on your decision to utilize community resources such as MODS in your future K-12 teaching

Note:

Note: Note: In order to receive full credit for the Volunteer Project for Extra Credit you are required to email this Self Reflection typed along with a copy of your lesson plan used to teach at the MODS to Dr. Kumar (david@fau.edu) no later than the deadline noted in your Syllabus. Also, your contact at the MODS must be emailing Dr. Kumar an evaluation of your performance on this assignment. Thank you.

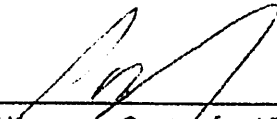
Academic Service Learning
Course Designation

This is to certify that the attached syllabus meets the University Requirements to qualify the course as Academic Service Learning.



Community Engagement College Liaison

9/7/18
Date



Weppner Center for LEAD & Service-Learning

9-11-18
Date

September 20, 2018

Adding Academic Service Learning to Existing Course

Please see the attached syllabus for SCE 6151, Science: Elementary and Middle School, which includes the ASL statement and student waiver as required on pages 1-2. Also, a brief description is included on page 3 and a detailed description of the ASL project is found on pages 15-15. All ASL wording is highlighted on the syllabus. No further changes are being made to the existing course.

Dr. Susannah Brown

College of Education Community Engagement Liaison

Dr. David Kumar, Professor, Science Education

Barbara Ridener

From: Michael Brady
Sent: Wednesday, October 31, 2018 3:20 PM
To: Barbara Ridener
Subject: RE: Adding Academic Service Learning to SCE 6151 curriculum sent to College of Education GPC

I've reviewed the courses, and I don't see any overlap or conflict with the course content or curricular experiences in the ESE Department. Good luck.

Michael P. Brady, PhD
Professor & Chair
Department of Exceptional Student Education
Florida Atlantic University
777 Glades Road
Boca Raton, FL 33431
(561) 297-3281
mbrady@fau.edu

From: Barbara Ridener
Sent: Wednesday, October 31, 2018 3:10 PM
To: Robert Shockley <SHOCKLEY@fau.edu>; Michael Whitehurst <whitehur@fau.edu>; Michael Brady <mbrady@fau.edu>; Deena Wener <wener@fau.edu>; Paul Peluso <ppeluso@fau.edu>; Dilys Schoorman <dschoorm@fau.edu>
Subject: Adding Academic Service Learning to SCE 6151 curriculum sent to College of Education GPC

Hi Everyone,

Apparently, this was not attached to a request I sent to everyone on 10/18 for no conflict.

Departmental faculty would like to add Academic Service Learning (ASL) to existing courses, SCE 6151, Science: Elementary and Middle School and SCE 4113. Please see the attached form, syllabus, ASL signed approval from the Weppner Center, and an explanation/rationale.

Please reply either no conflict or conflict (with explanation).

Thank you,

Barbara

Barbara Ridener

From: Dilys Schoorman
Sent: Wednesday, October 31, 2018 3:33 PM
To: Barbara Ridener
Subject: Re: Adding Academic Service Learning to SCE 6151 curriculum sent to College of Education GPC

No conflict from CCEI.

Take care,

Dilys



Dilys Schoorman, Ph.D.
Professor and Chair
Department of Curriculum, Culture and
Educational Inquiry
Florida Atlantic University
777 Glades Road
Boca Raton, FL 33431-0991
Tel: 561 297-3965
Fax: 561 297 2925

<http://www.coe.fau.edu/faculty/dschoorm/>

Visit our department website:

<http://www.coe.fau.edu/academicdepartments/ccei/>

Visit our Facebook Page:

<https://www.facebook.com/fauCCEI?ref+ts&fref+ts>

From: Barbara Ridener <BRIDENER@fau.edu>
Date: Wednesday, October 31, 2018 at 3:10 PM
To: Robert Shockley <SHOCKLEY@fau.edu>, Michael Whitehurst <whitehur@fau.edu>, Michael Brady <mbrady@fau.edu>, Deena Wener <wener@fau.edu>, Paul Peluso <ppeluso@fau.edu>, Dilys Schoorman <dschoorm@fau.edu>
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Please reply either no conflict or conflict (with explanation).

Thank you,

Barbara