New Course Proposal

Submit completed form electronically

1. **Course prefix and course number:**
   SC 120L

2. **Course title:**
   Concepts in Science: Light and Sound Lab

3. **Abbreviated title for class schedule** (30 characters or less):
   Science: Light & Sound Lab

4. **Credit hours:** 0

5. **Catalog description:**
   Corresponding lab for SC 120.

6. **Prerequisites (*to add each additional prerequisite, start a new line*):**
   None.

7. **Co-requisites (including labs, if any):**
   A. (course prefix, (space) and number): SCI 120

8. **Major/Class restrictions: Please indicate any class or major restrictions:** None

9. **Is course repeatable?**
   No
   If Yes, list maximum credits:

10. **Labs requirements:**
    If course includes a lab: # of hours lecture: 30**; # of hours lab:** 20
    The lab requires that students obtain materials on a materials list. Most will be common household/dorm items but a few will likely require purchase at minimal cost (*e.g.* a laser pointer, colored ink, a recorder or other simple wind instrument).

11. **Fees: List any course fees:**
    None.

12. **Grade Mode:**
    Option

13. **CIP Code: Six-digit CIP code** (check with your Division Director): 40.0801

14. Special qualifications; Is course proposed for (yes/no):

A. University Studies? Y **If yes, list Strand(s):** G

B. Honors? N

15. Cross-listing: List any cross-listing (and please complete the Cross-list proposal form at https://inside.sou.edu/provost/curriculum.html):

None

16. Strategic justification for proposed course:

A. Rationale: What is the overall strategic rationale for offering this course?

This course has 4 primary strategic rationales that, together, promote student access, retention, and success.

1. It will be offered online, increasing student accessibility while reducing space (lab access and classroom lecture halls) and energy loads on campus.
2. As a second online G-strand course with a lab component, it will allow students to complete their G-strand requirement online. This will be very useful for students completing their studies at a distance and/or with schedules or transportation issues that do not easily accommodate weekly lab sections.
3. It has been designed using the same welcoming and supportive approach as SC110/110L.[1] As such, it is a student-centered lab science course that focuses on topics that are likely interesting, relevant, and accessible to students who enjoy science and, more importantly, those who have not yet developed a sense of enjoyment or ability in the area of science.
4. The core concepts explored in this course (light, color, sound, music, and experimentation) are important across a number of SOU disciplines (*e.g.*, biology, music, art, theater arts, communication, EMDA, psychology) and will likely have a wide appeal.

B. Alignment:

1. How does this course align with the unit's mission plan?
   This course is designed to support efforts to increase access to integrated STEM courses that engage students and stress hands-on, investigative learning through

[1] The instructor of SC110/110L has received multiple student comments in evaluations that are the lines of "I didn't like science until I took this course." For example, from the most recent 3 terms having offered the course: **Spring 2019**, *Most understandable science class I have taken, keep everything!*; **Summer 2018**, *One of the best science classes I've ever taken*; **Spring 2018**, 1. *This course is well thought out and appeals to learners of every type. [instructor..] is thoughtful in her feedback and very supportive of the class. I never thought I would enjoy Science; now I am eager for more.,* 2. *I liked this course the way it is currently, I would retain the entire course. I learned a lot in this course from why it's so important to use science and how science is used in everything we do in life. The course Made learning "Fun" through using experiments to observe the reaction of how energy transfers, transforms, and degrade energy when conserved from one form to another, but is never destroyed.,* 3. *Effective course gives a great understanding of the needed aspects of science*, 4. *I liked the entire course the way it is currently. the course was very informative and offered many different ways to express myself through science, while teaching me how to preform the experiments gave me new insight to why science is so important to our lives…..* there are many more!

meaningful experiments. Also, the assessment of the course contributes to the development of the following LEAP knowledge and skill outcomes:

- *Knowledge:* the enduring relevance and importance of science and the scientific method; light and sound as physical manifestations of waves, a fundamental manner in which energy (and information) are carried
- *Skill development:* scientific inquiry as a means of learning, observation and analysis, critical thinking, and elementary quantitative literacy (through carefully constructed readings, questions, and lab reports); information literacy and written and oral communication (through lab reports and multimedia (video or audio) assignments); and reading comprehension (through assigned readings evaluated with quizzes and multimedia assignments). The course also offers student forums each week in which students are encouraged to share insights, post photos, or ask questions of one another when working through the experiments for the week. This has been successful in SC110/110L.

At the institutional level, this course meets goals of the University Studies G-Strand using innovative, learner-centered methods. The nature of the course content, combined with specific assignments, will help the students make meaningful connections between the physical properties of light and sound and their everyday experiences. The emphasis of the course is (1) science as a way of learning that hinges on objective observation, experimentation, and a willingness to be open; and (2) waves and their importance to the creation, modification, and propagation of light and sound; and (3) applications in geometric optics, color, and music. Students will also become more aware of the connection between the fundamental properties of waves and their use (and limitations) in communicative, creative, and technological applications.

Importantly, students are given the following consistent message: Some of the greatest joys in and opportunities for learning in science are when results counter expectations or provide more insight than what was expected. In each experiment, just before creating a hypothesis, students are given the following message: *IMPORTANTLY, doing science is NOT about being right. Doing science is about guessing and experimenting, observing, remarking on the results with one of the two most important words in science: "aha!" or "huh!", and trying to understand the results based on what you know.*

Students are engaged in weekly scientific experimentation and reporting, 4 multimedia (video or audio) submissions, 2 discussion question sessions (one during the first week of class as a pre-test, and the second highlighting the gains for each student over the term), and weekly testing to assess the quality of knowledge integration and skill development.

The physical experiments are unique for this course, as they are performed outside of the University and the student is fully involved throughout the process—it is the student who prepares the materials from the materials list, performs the full

procedure, and records and analyzes data. The student documents their work visually and communicates the results with standard written lab reports. The students also have the opportunity to discuss their experiments with each other, each week in a forum designated for this purpose. There, they are encouraged to share: their creative approach to one or more experiments, particularly cool photos (our so-called experimental photojournalism), interesting results, insights that might help other students proceed, points of confusion, and technical difficulties. Though they are encouraged to confer with one another before contacting the instructor, the instructor is always available and willing to respond to student questions, input, and (particularly fun) enthusiasm.

With the multimedia assignments, the students are asked to teach a concept or explain a figure from an array of choices. This teaching technique has been successfully employed in SC110, and it requires that the students reflect on their own understanding, identify individual (correct/incorrect) assumptions and struggles with the material, come to a better understanding, and develop an effective presentation from this process. Students are required, at least once in the term, to respond to another student's video to discuss how the video helped them see the material differently, share additional information they found with external research (either through experimentation or another source of reading / video / etc.), and provide feedback for the student they are responding to by emphasizing both one thing the student did well and one thing they could improve.

With the above design, the course aligns with goals to increase STEM accessibility while providing students with quality instruction that increases their scientific awareness; their valuation of experiments; their experimental skills; and their critical thinking, information literacy, and communication skills.

2. How does the course fit into the rest of the unit's curriculum?
   There is an increasing need for G-strand lab courses at the University, following retirements and reductions in STEM programs. This course will help meet that need. Importantly, this course will also allow students who cannot complete their G-strand requirement on campus.

C. **Enrollment**: What is the new course's estimated enrollment each time it is offered over a three-year period?
   Year 1: 30-45 (winter or spring) + 45-60 (summer)
   Year 2: 45-60/term, to alternate with SC110/110L and other online offerings
   Year 3: If successful, the goal is to offer an online G-strand offering multiple times per academic year, including summer, when many students are away from campus but would like to work on their University Studies science requirements.

D. **Resource evaluation:** What resources – faculty, equipment, lab space, etc. -- will be needed to offer this course and how will those resources be obtained?
   1. *Faculty*:

a. Who will teach the course?
   Ellen Siem has developed this course and would like to teach it as a way to make science more accessible and less daunting to our general student body.
b. Evaluate unit's faculty availability and/or needs and the impact on other teaching obligations.
   The course will fold into other G-strand offerings in STEM and be staffed accordingly. The online offering reduces congestion for lab offerings.
c. If additional faculty members are needed, how will that need be met?
   This course should not require more than one instructor at the rate it is expected to be offered.

2. *Facilities*: Cite any additional need for classrooms, equipment or lab space; explain how that need(s) will be met.
   As an online course, it is not expected to not have additional needs for classrooms, equipment, or lab space.
3. *Other*:
   a. Are Hannon Library resources sufficient to meet the needs of this course?
      Yes. Students may, on their own, opt to use the Hannon Library for materials to provide further insight, but (at this point) it will not be required that they do so.

   b. Are any other resources needed to support this course?
      There may be a greater need in this course relative to others for IT support because it an online offering.

      If so, please explain how they will be obtained.
      Students will be instructed to contact the SOU Helpdesk. If excessive (or regularly incurred) technological needs are found, the course will be modified to meet students where they are, providing additional instruction through the course "classroom" or another means of sharing information.

E. **External impact**:
   1. What is the expected effect of this course on existing programs elsewhere in the university?
      This course is not expected to affect existing programs.
      NOTE: Please document your contact with other academic programs which may be affected by this new course and the response you received.

   2. Will any of your prerequisites affect other academic programs?
      No.
      NOTE: Please document your contact with other academic programs which may be affected by this new course and the response you received.

17. Syllabus (condensed)

*(Attach an accompanying, condensed syllabus, which should include the following items. Schedules and similar details are **not** required.)*

1. **Course description (same as Catalog description, above)**

2. **Learning objectives of the course**

3. **Required texts**

4. **Course format**

5. **Other – any other relevant materials needed to explain the goals and teaching methods of this course.**

Approvals:

_____ _____

Signature of Division Director Date

4/29/16

Syllabus for

Concepts in Science: Light and Sound

General Course Information

Title:	Concepts in Science: Light and Sound
Prefix:	SC120 (course) / SC120L (lab)
CRN:	xxxx/xxxx
Term:	Spring 2020
Medium:	Moodle, YouTube, html
Notes:	This course is fully online. There is one combined grade for SC120 and SC120L.

Instructor Information

Name: Dr. Ellen Siem (please call me "Ellen")
Office: Science 179
Email: sieme@sou.edu
Office Hrs*: TBD

SOU Catalog Description

Imagine using light, color, sound, and music to develop and apply scientific thinking and experimentation skills. We will do just that in this course, which is designed for those who might benefit from or enjoy a better understanding of the properties, perceptions, and applications of light and sound, specifically through the lens of optics, color. and music. Though a science course, it is developed for both scientists and non-scientists alike, and has no prerequisites. We will use readings, free online resources, and hands-on experiments to develop a conceptual framework for the physical properties of light and sound. This course builds a strong and very welcoming, supportive community through short video assignments and shared forums for experiments.

Hopefully approved for University Studies (**Explorations - Strand G, Science with a Lab)**.

Prerequisite(s): None

Corequisite(s): SC120L

Course Introduction

Course Concepts

In this course, we will recognize the enduring relevance and importance of science and the scientific method and identify light and sound as physical manifestations of waves, a fundamental manner in which energy (and information) are carried. There four main ideas in our course, the first of which is the most important. The ideas are: (1) science is a powerful way of learning that hinges on objective observation, experimentation, and a willingness to be open; (2) light and sound are physical manifestations of waves and are interpreted through their wave characteristics (such as frequency or pitch) and wave behavior (such as interference and resonance); and (3) light and sound have direct (and delightful) applications in geometric optics, color, and music.

As the course unfolds and we study the four major ideas, we will pay close attention to the following concepts:

- Science is a study of natural phenomena using observation and experiment.
- Waves are a natural phenomena that occur all around us.
- All waves can be thought of as a disturbance that transfers energy.
- Light is an electromagnetic wave, and sound is a mechanical wave.

- In common terminology, light is the visible portion of the eleectromagnetic spectrum.
- The polarization, reflection, refraction, and dispersion (into its colors) of light give rise to many observable natural phenomena and are regularly harnessed in society.

- When interacting with objects, light can be absorbed, reflected, and/or transmitted and refracted.
- Both the camera and the eye use lenses to redirect light and create images.
- Cones in the retina of the eye give rise to the perception of color (when the light is not too dim).
- Color can be defined in terms of hue, saturation, and brightness.
- The color of an object depends on several factors, including the color and intensity of the lighting, the color of surrounding objects, and substances in the path of the light.
- There are two main types of color mixing: additive (wavelengths add, as in mixing lights of different colors) and subtractive (some wavelengths are absorbed and thus subtracted, as in mixing pigments).

- Oscillations (or vibrations) include the vibration of violin strings and the vibrations of strings and air columns in musical instruments.
- Oscillations that decay over time are damped; oscillations that build over time are driven.
- Resonance occurs when external forces driving an oscillation occur at a frequency that matches the natural frequency of a system. When resonance occurs, the amplitude of the oscillation reaches a maximum!
- Reflection and interference of sound play an important role in, for example, concert hall acoustics.
- Beats (a wavering sound) can be heard when two sounds differ slightly in frequency.
- Sound can be described in terms of pitch, loudness, and timbre.
- When a string fixed at both ends vibrates, only certain frequencies are allowed. Likewise, when columns of air oscillate, only certain frequencies are allowed.
- The lowest allowed frequency is known as the fundamental frequency; other allowed frequencies are integer or odd integer multiples of the fundamental.
- When a string vibrates, many of its allowed frequencies play at once (superposition), creating overtones. Higher frequencies tend to decay faster, and certain frequencies can be highlighted with strategic damping.
- To play a tune, one must be able to change the frequency of a sound. This can be achieved in different ways for different musical instruments.

Course Outcomes[1]

By the end of this course, students will be able to do the following things.

1. Think, investigate, and communicate scientifically
   - recognize and demonstrate science as a way of learning and distinguish scientific and nonscientific ways of thinking and communicating
   - formulate hypotheses and test them experimentally
   - develop experimental techniques and skills in data collection
   - develop skills in data analysis by identifying important patterns and trends in experimental data
   - develop the ability to ask “a next question” based on conclusions from the data
   - develop scientific communication skills through report-writing and discussion

2. Define light and sound as physical manifestations of wave behavior, and
   - identify wave properties such as wave amplitude, wavelength, period and frequency, and wave speed
   - describe light as a transverse wave and sound as a longitudinal wave
   - associate light and color with the visible portion of the electromagnetic spectrum
   - describe and apply the law of reflection; conceptually describe and examine the refraction of light, the index of refraction, and the disperson of white light into its colors
   - distinguish between convex and concave lenses and describe images created by convex lenses
   - identify and summarize the importance of the main parts of the eye, including the light-sensitive retina

[1] See the more general language for the goal and proficiencies for Explorations Strand G — Science on the last page of the syllabus. Note that goal 1 is the primary focus of the course, and goal 2 is the primary focus of the lab.

- describe color, color-generating mechanisms, color perception, and color mixing (both additive and subtractive)
- describe oscillations and, specifically, the relationship between the length of a simple oscillator and its natural frequency
- illustrate the difference between damped and driven oscillations; explain resonance
- describe specific cases of sound interference
- describe standing waves and relate them to harmonics in strings and air columns
- describe the perceptions of sound, particularly in musical terms, the generation of tunes in instruments

3. Communicate complex concepts visually and orally through multimedia
   - reflect on one's own understanding to identify parts of a concept or a figure or graph that are clear, unclear, or incorrectly or incompletely integrated
   - learn from this process to develop a greater awareness
   - with improved awareness, determine how to best convey the concept to other members of the class
   - successfully create and share video and/or audio to present the concept to the class

Required Texts

Gilbert, P., & Haeberli, W. (2012). *Physics in the arts.* Amsterdam: Academic Press.

Other Required Materials

1. The experiments require students to purchase materials for completion. A materials list can be found here.
2. Access to a video (or voice) recorder and camera (cell phones often do the trick!) to complete the multimedia and lab assignments.

Assignments and Grade Scale

There is one grade for the course (SC120+SC120L).
Student can achieve a maximum of 200 points, distributed as follows:

SC120	Multimedia assignments (4): 30 pts Discussion forums (2): 20 pts Weekly quizzes (8): 40 pts Final exam: 10 pts
SC120L	Lab reports (8): 100 pts

Total: 200 pts

Grade Scale:

A 200-190, **A-** 189-180, **B+** 179-174, **B** 173-166, **B-** 165-160, **C+** 159-154,

C 153-146, **C-** 145-140, **D+** 139-127, **D** 126-114, **D-** 113-101, **F** 100-0

Course Structure

During the ***first week***, you are required to complete 2 introductory assignments: **1.** The multimedia assignment will help you prepare for later assignments while giving you a chance to introduce yourself to me and everyone in the class. **2.** The first discussion question assignment is not graded for accuracy, so please do not worry. It will serve as a way for me to assess what you have learned between the first and last week of the course.

The core of the course (***Weeks 2-10)*** is divided into 8 modules, with the intent that the modules be completed sequentially. Students are expected to complete roughly one module per week for the duration of the term.

Module Assignments

All module assignments include a quiz over readings and/or video and lab reports for one or more experiments. Some modules also require the submission of a multimedia assignment, and the last one includes a graded discussion question assignment.

Module	**First Assign-ments**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**Final Assign-ments**
Items due....	**Sun.** of Week 1 **(4/5)**	**Sun.** of Week 2 **(4/12)**	**Sun.** of Week 3 **(4/19)**	**Sun.** of Week 4 **(4/26)**	**Sun.** of Week 5 **(5/3)** **next due date in 2 wks**	**Sun.** of Week 7 **(5/10)**	**Sun.** of Week 8 **(5/17)**	**Sun.** of Week 9 **(5/24)**	**Sun.** of Week 10 **(5/31)**	**FRIDAY** of **FINALS WEEK** **(6/12)**
Multi-media Assign. (4 per student, **30 pts)**	✓ (**all** students; **5 pts**)			✓ (**If** your **LAST NAME** begins with **A-L 10 pts**)	✓ (**If** your **LAST NAME** begins with **M-Z 10 pts**)		✓ (**If** your **LAST NAME** begins with **M-Z 10 pts**)	✓ (**If** your **LAST NAME** begins with **A-L 10 pts**)		✓ (**all** students; **5 pts**)
Disc. Questions (2 total, **20 pts)**	✓ (**5 pts** awarded if completed on time)								✓ (**15 pts**)	
Quizzes (8 total**, 40 pts)**		✓	✓	✓	✓	✓	✓	✓	✓	
Final* (10 pts)										✓
Lab Reports (100 pts)		✓	✓	✓	✓	✓	✓	✓	✓	

200 total points possible in SC120 + SC120L

Modules are organized such that ALL Module 1 assignments are due at the end of Week 2, ALL Module 2 assignments are due at the end of Week 3, etc.[2], so that students do not find themselves in a situation where they have delayed the completion of assignments in earlier modules until the end.

Lab Reports:

- Each module includes two laboratory experiments that you can complete at home using a lab kit!
- As a guide, instructions for each experiment include several photos as well as a short video.
- Lab reports generally require the following:
  - your hypothesis or hypotheses (1-2 sentences)
  - the data you collected, often in a table
  - your quantitative analysis of the data (simple graphs or calculations, as needed)
  - answers to a series of short questions
  - comparison of your hypothesis (hypotheses) to the experimental results
- Each experiment will require that you document a portion of your work using one or more photos.
- Both an example report and a rubric will be available to you on Moodle as a guide. Use them! In addition, before submitting a response, ask yourself the following questions:
  - Did you include and clearly label your introduction, hypothesis, data section, analysis, and summary?
  - Are your ideas logically organized and written clearly and concisely?
  - Do some of your sentences or words simply fill space? (Eliminate these, if so.)
  - Can a reader easily read and understand your data and analysis sections?
  - Are spelling, punctuation, and grammar correct?
  - Are all required tables and graphs included, and are all properly labeled with a main title, column/axes labels, and appropriate SI units?

Quizzes:

- You will have a 20-minute quiz available on Moodle in every module.
- The quizzes will open sequentially, so that, for example, once you've completed the Module 2 quiz, you can take the Module 3 quiz.
- The quizzes will be based on the reading, notes, and/or video posted on Moodle for that module.

Multimedia Assignments:

- Each student is required to submit 4 multimedia assignments!
- Assignments ask for short video, but you can be creative—please let me know if you are considering another medium (e.g., making an animation, using an audio file)!
- In the **1st assignment**, you will introduce yourself to the class.
- For the **2nd assignment**,
  - IF your LAST NAME begins with a letter between A-L, you will post a summary of material you have read and chosen to discuss. A week later, IF your LAST NAME begins with a letter between M-Z, you will provide feedback to one of the summaries.
- For the **3rd assignment** the roles switch:
  - IF your LAST NAME begins with a letter between M-Z, you will post a summary of material you have read and chosen to discuss. A week later, IF your LAST NAME begins with a letter between A-L, you will provide feedback to one of the summaries.
- In the **4th assignment**, you will provide a "summing up" of the course.
- Please use the rubrics I have provided to organize the content and delivery of your submissions!

Discussion Questions:

- You will have 2 sets of discussion questions to answer.
- The 1st is due at the end of the first week and graded only on effort, so don't panic!

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[2] Note that there is a break after week 5: Module 6 assignments are not technically due until Week 7 so that you can catch a breath after midterms. *Yay!* Take it if you need it; otherwise, my advice is to work ahead so that your last few weeks of the term are easier!

- The 2nd will occur in the last module and will require responses that demonstrate your synthesis of the material.
- Your responses for the 2nd should be relevant, accurate, and original. They should also be clear, comprehensible, coherent, and organized. **If I cannot understand the writing, I cannot give full credit to a response!**
- On Moodle, you will have access to the rubric that will be used to grade the 2nd set of discussion questions. Please use the rubric as a guide! In addition, before submitting response, ask yourself the following questions:
  - Does your response thoroughly address the question or drift to other topics?
  - Are your ideas logically organized and written clearly?
  - Are all ideas in your response constructive and concise, or are do some simply fill space?
  - Can a reader (myself and your classmates) easily determine the main point(s)?
  - Does your contribution provoke further thought?
  - Are spelling, punctuation, and grammar correct?
  - If you used sources, did you reference them?

Final Exam:

- You will have a 120-minute final exam, available on Moodle during finals week.
- It will be due the Friday of Finals week, by midnight.
- The final exam will be cumulative, so it is important that you stay on top of the material!

Explanation of Assignments in Detail and Dates Each is Due

Assignment explanations and detail will be found on Moodle. Assignments and their due dates are indicated in the course schedule. Some grades will be assigned on a scale of **plus** (exceeds expectations, 100% of the maximum score for assignment), **check** (meets expectations, 70% of the maximum score for assignment), **minus** (does not meet expectations, 0-50% of the maximum score for assignment).

Above all, remember: You GOT This.

Schedule of Topics

	Topics	Experiment 1	Experiment 2
Introductory Assignments	Light & Light Waves	Color and Temperature	-
Module 1	Reflecting & Bending Light	Rough & Smooth Reflections	Lasers in Jello
Module 2	Seeing: The Eye & the Camera	Peripherial Vision & Blind Spots	Personal Lenseless Camera
Module 3	What is Color?: Color & Color Vision, Color-Generating Mechanisms	Color Perception	Rose Colored Glasses, & other Filters
Module 4	Color Mixing	Spectral Color Mixing (Additive)	Pigment Color Mixing (Subtractive)
Module 5	Oscillations, Oscillations that Dwindle, & Oscillations that Grow	How to Influence the Period of an Oscillation	When Oscillators Resonate
Module 6	Sound Waves, Adding Sound Waves	Seeing Sound	Speed of Sound
Module 7	Perceiving Sound: Pitch, Loudness, Timbre, & the Ear	Sound Amplification, Sound Damping	Frequency & Pitch
Module 8	Playing Strings and Pipes	Vibrations of Strings	Vibrations in Pipes
Final	Musical Instruments	-	-

Assignments			

Policies and Guidelines

1. SOU Cares Reports

SOU has a wide range of resources to help you succeed. Our faculty, staff, and administration are dedicated to providing you with the best possible support. The SOU Cares Report allows us to connect you with staff members who can assist with concerns, including financial, health, mental health, wellbeing, legal and/or family matters, harassment, assault, study skills, time management, etc. You are also welcome to use the SOU Cares Report to share concerns about yourself, a friend, or a classmate at http://www.sou.edu/ssi. These concerns can include reports related to academic integrity, harassment, bias, or assault. Reports related to sexual misconduct or sexual assault can be made anonymously or confidentially. Student Support and Intervention provides recourse for students through the Student Code of Conduct, Title IX, Affirmative Action, and other applicable policies, regulations, and laws.

4. Statement on Academic Honesty and Code of Student Conduct

Students are expected to maintain academic integrity and honesty in completion of all work for this class. According to SOU's Student Code of Conduct: "Acts of academic misconduct involve the use or attempted use of any method that enables a student to misrepresent the quality or integrity of his or her academic work and are prohibited".
Such acts include, but are not limited to: copying from the work of another, and/or allowing another student to copy from one's own work; unauthorized use of materials during exams; intentional or unintentional failure to acknowledge the ideas or words of another that have been taken from any published or unpublished source; placing one's name on papers, reports, or other documents that are the work of another individual; submission of work resulting from inappropriate collaboration or assistance; submission of the same paper or project for separate courses without prior authorization by faculty members; and/or knowingly aiding in or inciting the academic dishonesty of another.
Any incident of academic dishonesty will be subject to disciplinary action(s) as outlined in SOU's Code of Student Conduct: http://arcweb.sos.state.or.us/pages/rules/oars_500/oar_573/573_076.html
In case of loss, theft, destruction or dispute over authorship, always retain a copy of any work you produce and submit for grades. Retain all written work that has been graded and handed back to you.

5. Statement on Title IX and Mandatory Reporting

Federal law requires that employees of institutions of higher learning (faculty, staff, and administrators) report to a Title IX officer any time they become aware that a student is a victim or perpetrator of gender-based bias, sexual harassment, sexual assault, domestic violence, or stalking. Further, Oregon law requires a mandatory report to law enforcement of any physical or emotional abuse of a child or other protected person, including elders and people with disabilities, or when a child or other protected person is perceived to be in danger of physical or emotional abuse.

If you are the victim of sexual or physical abuse and wish to make a confidential disclosure please contact any of SOU's confidential advisors (http://www.sou.edu/ssi/confidential-advisors.html), or use Southern Oregon University's Anonymous Harassment, Violence, and Interpersonal Misconduct Reporting Form (https://jfe.qualtrics.com/form/SV_7R7CCBciGNL473L)

6. Statement on Academic Support/Disability Resources at SOU

To support students with disabilities in acquiring accessible books and materials and other reasonable accommodations, SOU requires all professors to include a statement on Academic Support and Disability Resources on course syllabi. It is the policy of Southern Oregon University that no otherwise qualified person shall, solely by reason of disability, be denied access to, participation in, or benefits of any service, program, or activity operated by the University. Qualified persons shall receive reasonable accommodation/modification needed to ensure equal access to employment, educational opportunities, programs, and activities in the most appropriate, integrated setting, except when such accommodation creates undue hardship on the part of the provider. These policies are in compliance with Section 504 of the Rehabilitation Act of 1974, the Americans with Disabilities Act of 1990, and other applicable federal and state regulations that prohibit discrimination on the basis of disability.

If you are in need of support because of a documented disability (whether it be learning, mobility, psychiatric, health-related, or sensory) you may be eligible for academic or other accommodations through Disability Resources. Call Academic Support Programs at (541)552-6213 to schedule an appointment with Disability Resources. The Academic Support Programs office is located in the Stevenson Union, lower level. See the Disability Resources webpage at inside.sou.edu/dr for more information. If you are already working with Disability Resources, make sure to request your accommodations through them for this course as quickly as possible so that you have the best possible access.

Disclaimer: This syllabus is an important document and will be followed as closely as possible. However, the universe has a way of changing even the best of plans! For this reason, it is important to note that the instructor may modify aspects of the syllabus if the need arises. Please don't worry! If there are changes to the syllabus, students will be notified as soon as possible and given adequate time to complete remaining assignments.

Exploration Learning Goals (E, F, G) stress acquiring a broadly informed knowledge of the various disciplines and becoming familiar with the kinds of inquiry that occur within the aesthetic, social, and scientific worlds.

Strand G: Sciences – Physical, Biological, and Computer

Understand the fundamental concepts, methods, and applications of the sciences and their impacts on human experience.
SOU defines the sciences as those disciplines that focus on a systemized body of knowledge derived through objective methodologies involving repeatable experimentation, observation, verification, and study. A lab class will include a practical laboratory component that accompanies lecture and course material. We define a lab as a controlled setting where scientific experiments are performed.

1. **Understand major concepts, principles, and theories of the sciences.**
   Proficiencies: Students will be able to
   1. Apply critical thinking, quantitative reasoning, and/or problem-solving skills to evaluate scientific evidence, theories, and hypotheses.
   2. Use language and concepts of a science discipline.
   3. Understand the broad historical outline of the development of the scientific worldview and important theories.
2. **Understand science as a means of learning about and understanding the natural world.**
   Proficiencies: Students will be able to generate and test scientific hypotheses by
   1. Designing and carrying out experiments and systematic observational studies. In some cases this may include a laboratory or field setting.
   2. Using appropriate tools to analyze results.
   3. Communicating results orally and in writing according to established standards of scientific communication, including appropriate use of tables, figures, and graphs.
3. **Apply scientific knowledge and methods to societal issues.**
   Proficiencies: Students will be able to
   1. Inform decision-making on social, political, and/or economic issues.
   2. Explain interrelationships between society and the sciences.
   3. Investigate impacts of technologies on segments of society and investigate plausible solutions to adverse impacts.

(from: https://www.sou.edu/universitystudies/index.html)