Course Overview: What is Integrated Environmental Science all about?

This course integrates earth science, life science, physical science, engineering and design thinking through the lens of the environment. We will engage in science and engineering practices while conducting field and laboratory work around a diverse array of environmental topics. Be prepared to generate your own questions about scientific phenomena and use them to extend your learning regularly throughout this course. We will rely on both empirical evidence—to “figure out” how a scientific phenomenon works—and on published evidence, to supplement various in-class and outdoor learning opportunities. We will also rely on individual reflection, collaborative group work, and teacher- and student-facilitated discussions, to drive our learning. By the end of this course, you will have had opportunities to deepen your sense of place, to cultivate your sense of environmental stewardship as it is defined by WUHSMS’s Portrait of a Graduate, and to develop the skills it takes to be a scientist as defined by the Next Generation Science Standards. Join us on this exciting adventure and welcome to IES!

Standards: What knowledge and skills will I gain by the end of this course?

This course will assess the knowledge and skills students build in key Anchor Standards and Content Standards.

Anchor Standards: This course will assess the knowledge and skills students build in key Anchor Standards. A student will have multiple opportunities to show their proficiency in each Anchor Standard. Below, each Anchor Standard for this course is named and described.

Modeling: A science and engineering practice is to use and construct models as helpful tools to illustrate ideas and explanations and include diagrams, drawings, physical replicas, mathematical representations, analogies, and computer simulations.
**Computational Thinking & Mathematics:** In science and engineering, mathematics and computation are fundamental tools for representing physical variables and their relationships, and are used for a range of tasks such as constructing simulations, statistically analyzing data; and recognizing, expressing, and applying quantitative relationships.

**Arguing from Evidence:** Argumentation is the process by which explanations and solutions are reached.

**Design:** Elements of design thinking include opportunities to target and empathize with an intended audience, to research issues associated with a design problem, to develop multiple solutions, including prototypes, to engage in a process of critique and revision around multiple iterations, and to present a final version and an evaluation of the performance.

To read more about a particular practice, visit [Appendix F: Science and Engineering Practices in the NGSS](#).

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**Units & Science Practices: What will we be learning about and doing in this course?**

The course incorporates the three-dimensional learning framework as defined by [NGSx](#). The foundation for each unit of study is grounded in the performance expectations from the [Next Generation Science Standards](#), and are listed below for your convenience.

<table>
<thead>
<tr>
<th>Unit of Study</th>
<th>Next Generation Science Standards</th>
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<tbody>
<tr>
<td>Regenerative Solutions</td>
<td>HS-ESS3-2 Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios. HS-ESS3-3 Create a computational simulation to illustrate the relationships among the management of natural resources, the sustainability of human populations, and biodiversity. HS-ESS3-4 Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.</td>
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<tr>
<td>Earth Systems &amp; The Global Carbon Cycle</td>
<td>HS-ESS3-6 Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity. HS-LS2-4 Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem.</td>
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<tr>
<td>Ecosystems</td>
<td>HS-LS2-1 Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales. HS-LS2-4 Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem.</td>
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<tr>
<td>Earth’s Climate History</td>
<td>HS-ESS2-4 Use a model to describe how variations in the flow of energy into and out of Earth’s systems result in changes in climate. HS-ESS3-1 Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity. HS-ESS2-2 Analyze geoscience data to make the claim that one change to Earth’s surface can create feedbacks that cause changes to other Earth systems.</td>
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<tr>
<td>Earth History</td>
<td>HS-ESS1-5 Evaluate evidence of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal rocks. HS-ESS2-1 Develop a model to illustrate how Earth’s internal and surface processes operate at different spatial and temporal scales to form continental and ocean-floor features. HS-ESS2-3 Develop a model based on evidence of Earth’s interior to describe the cycling of matter by thermal convection.</td>
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<tr>
<td>The Climate Emergency &amp; Earth’s Climate Future</td>
<td>HS-ESS2-4 Use a model to describe how variations in the flow of energy into and out of Earth’s systems result in changes in climate. HS3-5 Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth’s systems.</td>
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<tr>
<td>Energy &amp; Designing for the Future</td>
<td>HS-PS3-3 Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.* HS-ESS3-2 Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.</td>
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</tbody>
</table>
Biodiversity  

| HS-LS2-2 | Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.  
| HS-LS4-5 | Evaluate the evidence supporting claims that changes in environmental conditions may result in (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.  
| HS-LS2-7 | Design, evaluate and revise a solution for reducing the impacts of human activities on the environment and biodiversity.  

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**Assessment of Learning:**

For information about assessment types, scoring, and overall grade calculation: [click here](#).

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**Communication:**

**How Do I Access Work from Home, and What Should I Expect?**

- All work will be posted in Google Classroom.
- The work will be explained during our in-person meetings and/or by video posted to Google Classroom.
- The work will also be explained in our Class Planner posted to Google Classroom.
- If you have any questions, email your teacher.

**How Do I Know What My Grades Are?**

- On Summative Assessments, teachers will provide both a 4-point grade and a letter grade.
- You can monitor your progress in the following ways:
  - By reading feedback and scoring returned to students on summative assessments.
  - By monitoring the scores and Overall Course Mastery Grade in the Parent/Student portal on JumpRope. Reminders to check grades will be sent from the school.
  - Communicating with your teacher if you are unclear.

**Where Can I Find This Syllabus during the School Year?**

- This syllabus will be available on the school website in each subject’s department tab once the school year is up and running. It will also be available in our Google Classroom.

**How Do I See What’s Due?**

- Assignment and summative assessment due dates with handouts are posted in Google Classroom, with connection to Google Calendar, for student access.

**How Do I See What’s Past Due?**

- If a student is missing a grade on an assessment, it will be listed in the red “Missing Assessment” section of the JumpRope Parent/Student Portal along with any attachments. Please contact your teacher if you have any questions.

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**Materials:**

- 1 Spiral Bound Notebook, 8 ½” x 11,” + writing utensil
- A computer, fully charged
Outdoor attire & gear (To be prepared or a variety of weather conditions, see the section titled Dress for Success)

Schoolwide Procedures:

Please see the Student Handbook for Procedures and Policies related to: Due dates and deadlines, extra credit, retaking assessments, and turnaround time for grade entry.

Personal Mobile Devices: This class will follow the procedures outlined in the student handbook

Classroom Expectations:

Together, we will work to establish what each of the following Norms looks like, feels like, and sounds like, in our science classroom:

Safety
Connection
Equity
Evidence-Based Reasoning

These norms become extra important during small-group and classroom discussions, where it feels vulnerable or out of your comfort zone to share your thinking with the group. The rationale is that participating in classroom discussion helps hone ability to construct arguments using evidence-based reasoning and challenges us to become critical thinkers. Therefore, we will work to hold each other accountable to these norms regularly when we participate in small-group or whole class discussions, and reflect frequently. Additional rights and responsibilities are defined on our Purple Sheet.

Expectations Around Place-Based Excursions

We have the opportunity to employ the outdoor classroom. We have worked hard to plan several place-based excursions to enrich your experience in IES. To earn this privilege, you must be courteous hold yourself and others accountable to our co-constructed norms. Any student who cannot follow these expectations will be expected to be part of a collaborative problem solving conversation with the Dean of Students and the Educator.

Dress for Success

Please be prepared to venture outside, including near the river and into the woods, in a variety of weather conditions and across multiple seasons. On some days, it may be cold, rainy, or both! You may get cold or wet. You can prepare by dressing for success. Here is a list of some outdoor attire you might be asked to wear on days when we move our classroom outside.

- Socks & sneakers/boots (waterproof is best)
- Rain jacket
- Layers
● Gloves
● A warm hat
● A winter jacket

I will make a GoogleClassroom announcement a day ahead of time when we plan to go outside or take an advantage of one of our Outdoor Classroom Spaces.

Other equipment that may serve useful but are not required include:

- Hiking boots
- Waders
- Bug repellent
- Visor
- Sunglasses
- Binoculars
- A cushion to sit on