

Science 2010-11

Sustainability related courses: Sensors for Vernier Testing

Summary:

This initiative requests Vernier sensors for use in field biology and environmental science courses required by the new Sustainability Coordinator AAS degree program.

Description

Many field classes in Biology and EES involve testing substrates for various characteristics (like pH, Dissolved Oxygen, salinity, temperature, etc.) We have purchased a set of six Vernier probes that allow students to make these measurements quickly and accurately. To broaden the usefulness of the testers, we need to purchase sensors for the different characteristics being measured. These sensors vary in price and durability and represent a significant investment.

The sensors and probes connect to computers to provide data for analysis. Because they enable full use of computing technology, we are also including this request in the Tech Fund category as computer hardware. The equipment attaches to computers.

Questions and Answers

How is the initiative linked to the Unit Plans most recently submitted?

- 1. How does it continue the achievement of those goals?**
- 2. If this is a continuation of an initiative started last year, make sure that relationship is clear.**

How is this initiative linked to the efficiencies and productivities plans you had last year?

- 1. How does it continue the achievement of these plans?**
- 2. If this is a continuation of an efficiency or productivity plan started last year, make sure that relationship is clear.**

Themes:

1. optimizing sustainable access for students and options for quality learning
2. optimizing the curricula and resources we already have (continued from FY10)

Goals:

- 3) Increase sustainability-related curricula in support of sustainability in learning goals.
- 7) Additional curricular activities to improve student success and provide more options for

completing AAOT and other program requirements
9) Maintain and improve technology for student learning.

Hands-on learning is always central to learning, especially in the sciences. Past science unit plans have all included this idea. The purchase of Vernier testing equipment was made possible by funding of earlier unit plan initiatives. Science Division themes and goals have remained consistent from FY10 to FY11.

Describe the resources needed:

\$5,706 for purchase of Vernier sensors.

Information organized by:

Sensor Code Quantity Price Total

Disolved Oxygen Probe DO-BTA 6 \$209.00 \$1,254.00

Nitrate Ion-Selective Electrode N03-BTA 6 \$179.00 \$1,074.00

pH PH-BTA 6 \$79.00 \$474.00

Salinity SAL-BTA 6 \$92.00 \$552.00

Turbidity TRB-BTA 6 \$112.00 \$672.00

Vernier GPS VGPS 6 \$64.00 \$384.00

Light LS_BTA 6 \$55.00 \$330.00

Relative Humidity RH-BTA 6 \$69.00 \$414.00

Soil Moisture SMS-BTA 6 \$92.00 \$552.00

Total for six sets \$5,706.00

What specific measurable program outcomes do you expect to achieve with this initiative? The outcomes should be specific enough to be measurable. Also, outline the method that will be used to determine the results.

Outcomes:

- Use of probes and sensors by an average of 350 students each year. (record of courses using the equipment and enrollment of the sections)
- Wide range of learning outcomes supported by the hands-on use of the probes and sensors. (record of activities and associated learning outcomes; assessment of those outcomes)
- Sustainability learning outcomes for the Sustainability Coordinator AAS met through use of state-of-the-art equipment and analysis tools.

Department Priority:

4

Unit Resources:

Priority ranking for this initiative was determined by SAC members drawing numbers randomly. All the initiatives are valuable to the proposing disciplines and all have the support of the Division.

Vernier testing equipment is available, but its usefulness is limited because we have sensors for making only a limited number of kinds of tests. Faculty in Biology and EES will spend time learning to use the sensors and developing lab activities that make full use of this technology. Existing lab room computers will be used to download and analyze the data acquired from the Vernier sensors and probes.

Funding Request: Carl Perkins

Is this a Career & Technical Education program approved by the state and offered through Lane for credit?

No

If not a Career & Technical Education program, does your request provide considerable support for students enrolled in these programs?

Yes

Do you have an advisory committee that meets 2-3 times per year?

No

If request is for personnel, will funds be used to replace an existing position?

How will funding this initiative increase or sustain the academic achievement and technical skills attainment (GPA of 2.0 or better) of Career and Technical Education students?

A large body of literature confirms the pedagogical value of hands-on learning. Seeing real-world applications of the concepts learned in class will increase student success. The CTE students will benefit from using state-of-the-art technology to observe, gather and analyze data, and engage in critical thinking.

Outcomes:

- Use of probes and sensors by an average of 350 students each year. (record of courses using the equipment and enrollment of the sections)
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- Sustainability learning outcomes for the Sustainability Coordinator AAS met through use of state-of-the-art equipment and analysis tools.

How will funding this initiative increase or sustain the number of CTE students that graduate or receive a one year certificate from Lane and help prepare the students for employment?

It is anticipated that increasing awareness of sustainability issues will bring about an increased demand for coordinators with expertise in designing and implementing sustainable systems. Using state-of-the-art technology is a characteristic of high quality CTE programs. For the Sustainability Coordinator AAS program to grow, this sort of equipment is necessary.

EQUIPMENT \$

COMPUTER HARDWARE \$

COMPUTER SOFTWARE \$

MATERIALS & SUPPLIES \$

5706

CURRICULUM DEVELOPMENT (Hours)

PART-TIME FACULTY \$

TIMESHEET STAFF \$

TRAVEL \$

Can this initiative be partially funded?

Yes

EQUIPMENT \$

(E) Explanation of effect of partial funding:

COMPUTER HARDWARE \$

(CH) Explanation of effect of partial funding:

COMPUTER SOFTWARE \$

(CS) Explanation of effect of partial funding:

MATERIALS & SUPPLIES \$

3804

(MS) Explanation of effect of partial funding:

We would purchase only 4 sets of sensors. This will decrease our ability to make full use of our 6 Vernier testing systems. Exposure to state-of-the-art tools will be limited. If fewer sets are purchased students will be limited in their ability to personally use the sensors and probes.

CURRICULUM DEVELOPMENT (HOURS)

(CD) Explanation of effect of partial funding:

PART-TIME FACULTY \$

(PF) Explanation of effect of partial funding:

TIMESHEET STAFF \$

(TS) Explanation of effect of partial funding:

TRAVEL \$

(T) Explanation of effect of partial funding:

Funding Request: Curriculum Development

Funding Request: Technology Fee

1. Category of request

- **Maintain existing technology**
- **Increase student access to technology**
- **New technology**

Please type in the category of the request in the field below.

Increase student access to technology

2. Campus location

- **Main Campus**
- **Downtown Center**
- **Florence**
- **Cottage Grove**
- **CLC (list specific locations)**

Please type in the location of the request in the field below.

Main campus

3. Names of the person(s) with more information (if needed):

Albert Pooth, Barbara Dumbleton

4a. Budget ORGN

691800

4b. Budget PROG

111000

5. How many students will benefit per year?

A minimum of 350 students enroll in the six classes (14 sections) annually. Of these, approximately 20 are in the Sustainability Coordinator AAS degree. This number is expected to grow. In addition, ENVS courses are electives for the Water Conservation Technician degree.

6. Describe the benefit?

A large body of literature confirms the pedagogical value of hands-on learning. Seeing real-world applications of the concepts learned in class will increase student success. The CTE students will benefit from using state-of-the-art technology to observe, gather and analyze data, and engage in critical thinking.

It is anticipated that increasing awareness of sustainability issues will bring about an increased demand for coordinators with expertise in designing and implementing sustainable systems. Using state-of-the-art technology is a characteristic of high quality CTE programs. For the Sustainability Coordinator AAS program to grow, this sort of equipment is necessary.

COMPUTER HARDWARE \$

5706

COMPUTER SOFTWARE \$

STAFFING \$

INSTALLATION \$

LICENSING \$

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Yes

COMPUTER HARDWARE \$

3804

(CH) Explanation of effect of partial funding:

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COMPUTER SOFTWARE \$

(CS) Explanation of effect of partial funding:

STAFFING \$

(S) Explanation of effect of partial funding:

INSTALLATION \$

(I) Explanation of effect of partial funding:

LICENSING \$

(L) Explanation of effect of partial funding: