



INSTRUCTIONAL EQUIPMENT REQUEST

Due in Dean/Unit Head's Office on October 15, 2010 (FALL) and February 11, 2011 (SPRING)

The Definition of Instructional Equipment can be found in the California Community College's Budget and Accounting Manual. A copy of these definitions is on the PBC webpage at:
<http://grapevine.laspositascollege.edu/pbc/InstructionalEquipment.php>

Name of Requestor: M. Ansell, A. Flores, G. Gire, R. Grow **Ext:** 1334

Division/Unit : MSEPS/Chemistry

Brief title of request (equipment or materials being requested must be similar, related or part of a system): Titration, Heating, and Drying Equipment

Request amount (unit cost and total cost, including tax and shipping; please include all costs, such as installation, modification to existing facilities to accommodate new equipment, etc...; this information should come from the vendor quote):

Item (s) cost	\$2824.12
Tax (.0975)	\$275.35
Shipping	\$17.17
Installation	\$
Facilities Modification	\$
Other	\$
Total Cost	\$3099.47

Attach copy of quote(s), estimate(s) and requisition(s).
 (Must attach quote & requisition; absence of either will delay processing)

Please provide a brief description of the specific equipment or materials requested, including the # of pieces being requested, and what they will be used for (e.g., 10 crayola crayons, sky blue, etc...) in 250 words or less:

These standard laboratory equipment fall under the definition: "Instructional" shall mean equipment purchased for instructional activities involving...hands-on experience to enhance student learning and skills development."
 1 Lab Drying Oven: A 5-cubic feet capacity standard lab oven for drying and heating.
 26 (1 class set of 24 and 2 spares) Buret Clamps and Stands: A buret clamp attached to a stand is used to secure a buret upright during titration. Both the stands and clamps have other uses: clamps can also be used to secure other elongated glassware and the stands are also used as part of a heating apparatus.
 26 (1 class set of 24 and 2 spares) Bunsen burners: Used in many heating applications for many standard chemistry labs.

Is this in your Program Review? Yes No

Please describe how this request is incorporated into your Program Review:

The Program's mission is to serve transfer students majoring in the general sciences, engineering, allied health, or preparing for careers in medicine, pharmacy, or dentistry. In our 2010 Program Review, we emphasize an even stronger need for securing, maintaining, and replacing standard lab equipment as we face the challenge of increasing enrollments in multiple lab sections that have accelerated wear-and-tear on lab equipment. Our Program relies heavily on being able to provide a rigorous lab curriculum including standard laboratory techniques of titration, chromatography, and precise mass measurements and to carry out experimental procedures requiring heating. We identified as a specific challenge increased use of lab equipment (Page 12). On Page 13, we noted that "To address these challenges, we plan to request an increase in...b) funding to replace stockroom equipment, student locker materials, standard lab instrumentation, and safety equipment... The equipment being requested above are standard laboratory equipment listed under the inventory of needs for this maintenance form.

Is it a replacement? Yes **Upgrade?** Yes **New technology?** Yes

Please explain?

These requests are replacements due to accelerated wear and tear. The drying oven is very old and has a faulty thermostat and years of accumulated spills under the grating. Many buret clamps are unable to firmly secure a buret in place. Some of the old stands have warped bases and loose rod screws which make them unstable. Many Bunsen burners have chemical spills that are difficult to clean. Many can not sustain a stable flame and would flicker on and off which make them unsafe and unreliable. The valve covers are rusty and unwieldy.

**Below is the evaluation criteria; please see corresponding Instructional Equipment Rubric at:
http://grapevine.laspositascollege.edu/pbc/documents/PBCInstructionalEquipmentRubric_2010-11.pdf**

Teaching & Learning/Impact on Enrollment (Total = 10 points for A& B)

**A. How will this item have a positive impact on instruction and/or teaching and learning in the classroom?
Is this for use by the Instructor or students, or both?**

To learn chemistry is to do chemistry. To teach chemistry is to show how chemistry is done. The laboratory work is a critical component of teaching and learning chemistry. This is where students:

- 1) learn general experimental methods and techniques,
- 2) hone their analytical skills,
- 3) are able to relate actual observations and experimental conclusions through the various wet chemistry activities that reinforce and enhance the learning of conceptual material.

IMPACT ON TEACHING

The Chemistry program is able to offer a rigorous lab curriculum that involves exciting and relevant experiments because we strive to maintain the standard laboratory equipment found in any college-level chemistry laboratory. Acquiring these replacements impacts teaching because:

- 1) they allow instructors to devote more of their attention to guide students in correctly carrying out the procedure and analyzing their results without wasting time trying to make equipment work
- 2) without standard laboratory equipment, the teaching and presentation of important chemical principles would be limited to paper-type exercises and computer simulations which are not how a majority of academic and industry lab work is done.
- 3) they allow teaching on an individual basis because students don't have to share equipment.

IMPACT ON LEARNING

Providing safe, easy-to-use instrumentation enhances students' learning in the laboratory because students can focus on improving their skills and understanding the concepts being applied.

Bunsen burners: Many chemical and physical processes require using the high-temperature, focused heat source of a Bunsen burner. Learning is enhanced because:

- 1) Many students are unfamiliar with using gas burners. Using safer and easier to use equipment designed for a specific procedure contributes to a more comfortable learning environment in which students feel more confident safely and knowledgeably using a piece of equipment.
- 2) Many of these unreliable burners flicker and turn off spontaneously or give off chemical vapors because of hard-to-remove encrusted chemical spills. These are especially distracting to students and take the focus away from the procedure and the important observations. They end up spending more time fiddling with the burner or looking for a working burner.

Drying Oven: The drying oven is used for many standard experiments including evaporation of chromatographic solvents, heating and cleaning glassware and crucibles, and drying chemicals to constant weight for accurate mass yield measurements. Learning is enhanced when students are provided reliable and predictable instruments which can efficiently and effectively help them carry out a procedure on which important observations and subsequent analysis depend.

Buret Clamps and Stands: These are used for titration. Titration is a standard laboratory technique that ALL chemistry students are expected to learn. In the discussion of Course Objectives for C-ID development, it was explicitly included in the one-sentence course lab objective: "At the conclusion of this course, the student should be able to individually employ standard laboratory techniques appropriate to the course content, such as titration." In a titration, students need to be able to micro-control the volumetric addition of a liquid while watching the volume reading closely. A set-up in which a buret is securely and reliably held upright enhances the students' ability to carry out the procedure and learn the skill. Having to constantly fuss with a moving buret is not conducive to learning this technique. In addition to titration, the stand is also used for stabilizing other instrumentation and glassware used in other measuring techniques.

B. How will the equipment impact enrollment, attract, or increase the number of students participating in a course or program?

In the last 5 years, our enrollments have gone up by 40% with the addition of new sections and increased fill rates. The Chemistry faculty and staff believe that the strength of our lab curriculum is a major attraction for many of the students who choose to take classes here at LPC. The drying oven, 1 class set of Bunsen burners, and 1 class set of buret clamps and stands are minimum required replacements to sustain the needs of our current number of students. Providing students with faulty, unreliable, unsafe, and hard-to-use equipment results in discouraging students from staying in the program and taking our lab classes.

Outcomes (Total = 10 points)

How does this equipment enable or enhance SLOs? What are the consequences related to learning outcomes if request is not funded?

Its role in chromatographic techniques makes the drying oven a necessary component of skill development and laboratory learning outcomes. For example, students in Chemistry 30B study properties of proteins and medicinal drug analysis using chromatographic techniques. Chromatography is a standard skill that all Organic Chemistry students have to learn. The oven is also used by Chem 1A and Chem 31 students in improving mass measurements of chemical reaction yields through the technique of drying to constant weight. It is also used to clean and dry glassware and crucibles to ensure that experiments are not contaminated and results are reliable. The Bunsen burners are important for the students' ability to make observations for high-temperature reactions and making stoichiometric measurements. As mentioned above, the buret clamps and stands are important components to carry out macroscale acid-base titrations and wine analysis.

In our Program Maintenance Form for Lab Curriculum Implementation, we stated the following benefits to student learning outcomes:

To learn chemistry is to do chemistry. To teach chemistry is to show how chemistry is done. The laboratory work is a critical component of teaching and learning chemistry. This is where students:

- 1) learn general experimental methods and techniques,
- 2) improve their analytical skills,
- 3) are able to relate actual observations and experimental conclusions through the various activities that reinforce and enhance the learning of conceptual material.

Without the ability to run safe laboratories, activities that promote student learning would be limited to paper exercises and computer simulations, which do not support the hands-on nature of learning chemistry.

This last statement summarizes the consequence related to learning outcomes in the laboratory if our request is not funded.

In addition, in the same form, we also addressed how laboratory activities support SLO's:

Our Chemistry SLO's are directly related to what students do in the lab. Students will assess higher in these SLO's if the knowledge and skills they need to demonstrate proficiency is reinforced in a more meaningful way through hands-on applications. The SLO's for 30A, 31, and 1A students all require that students be able to represent a chemical reaction in the form of a balanced equation. These students perform many of these reactions in the lab where they are able to observe them firsthand to be able to write chemical reactions meaningfully and predict products for similar reactions. The SLO for Chemistry 30B students require them to be able to distinguish the functions of biological molecules such as carbohydrates, lipids, and proteins, concepts that are made real when students carry out enzyme-catalyzed reactions such as the breakdown of complex sugars to simple sugars and the breakdown of triglycerides to form emulsifying agents. Chem 1B students are expected to be able to demonstrate knowledge and application of principles of kinetics assessed through the American Chemical Society examination. The learning of these principles is reinforced if students actually measure the effects of temperature, concentration, and the presence of a catalyst by performing qualitative and quantitative kinetics experiments. Chem 12A/12B students are expected to demonstrate knowledge of typical organic synthesis techniques and methods many of which (distillation, reflux, solvent extraction) are learned while performing reactions that involve volatile and flammable chemicals.

Total Cost of Ownership (Total = 5 points)

(This section attempts to identify what the ongoing costs of purchasing this equipment will be to the institution)

- a) What is the lifespan of the equipment? 5 years? 10 years? 20 years?**
- b) Is there sufficient current/planned space available for the storage and use of this equipment? If so, where will it be housed? If not, is there a proposed location and are there any costs associated with installation or modifications to the space?**
- c) Are there operating costs and how will they be covered by the department?**
- d) What will be required to maintain the equipment, such as regular servicing or upkeep? Who will perform maintenance, and what will the estimated costs be?**

a) Drying oven:

We estimate that the oven we would like to replace is at least 10 years old. With improved technology and better maintenance and handling, the lifespan could be increased to 20 years with the current number of students served in the program.

Bunsen burners:

We estimate that these could last between 5-10 years.

Buret clamps and stands:

These are sturdy enough that they could probably be used up to 20 years.

b) Yes. Since these are replacement equipment, there is currently storage space dedicated for these equipment.

c) There are no operating costs, only time investment in proper maintenance and handling of the equipment.

d) The drying oven needs to be cleaned by a lab technician once in a while. Students and instructors will take responsibility to maintain the Bunsen burners, buret clamps, and stands through proper use and storage. Once in a while, these may also require some professional repairs from our lab techs.

Health and Safety (Total = 2 points)

Explain if this equipment responds to a security or health and safety need for faculty and students:

The drying oven we currently need to replace has a faulty thermostat which sometimes causes it to go over the maximum required temperature. It also has accumulated many years of spilled unknown chemicals under the grating which makes it very difficult and unsafe to clean.

Many of the Bunsen burners being replaced burn unreliably, flickering and turning off which poses a safety hazard especially to students who are not used to using gas burners. Many of them also have encrusted chemicals that are not easily removed but could melt and vaporize during use.

Buret clamps and stands are designed to secure burets and heating apparatus safely so that accidents can be avoided while students are performing the experiment.

Visibility/Profile within Community (Total = 1 point)

Is this a “flagship” item that will bring recognition/notoriety to the College or raise the stature of the program? Will it attract students and/or enhance the image of the College in the community because of its rare, one-of-a-kind status?

The items being requested are standard chemistry lab equipment found in every lower-division laboratory program. Not having these standard and safe lab equipment would definitely cause students to have an unfavorable impression of the College's ability to deliver a sufficient, if not outstanding, Chemistry Program for transfer in the sciences, engineering, allied health, and other fields. It would not take more than one bad accident caused by faulty equipment for the Program to lose its stature in the community.

Commitment to Sustainability (Total = 1 point)

If the equipment exceeds basic sustainability goals or provides renewable resources to the College, provide specific details:

Using one drying oven instead of numerous hotplates for drying helps reduce electricity usage.

The sturdy construction of these equipment designed for multiple use by students contributes to relatively long functional lifespans which contribute to material use efficiency.

Access (Total = 1 point)

Provide evidence that the requested equipment is consistent with universal design* and will ensure access above and beyond standard capability.

Laboratory experiments serve students who learn best in a hands-on setting where they can directly observe chemical phenomena. These equipment are designed for college-level use. They are easy-to-use, modern, and safe which enable access above and beyond standard capability. They are intuitive to use, even for students who have never used a gas stove. They are easy to set-up and don't require physical exertion.

**Universal design is an approach that addresses and redresses the primary barrier to making expert learners of all students. Some examples include: light switches with large flat panels rather than small toggle switches; buttons and other controls that can be distinguished by touch; bright and appropriate lighting, particularly task lighting; auditory output redundant with information on visual displays; visual output redundant with information in auditory output; contrast controls on visual output; use of meaningful icons with text labels; clear lines of sight to reduce dependence on sound; volume controls on auditory output; speed controls on auditory output; choice of language on speech output. Items incorporating the principles of universal design feature: equitable use; flexibility in use; simple and intuitive; perceptible information; tolerance for error; low physical effort; and size and space for approach and use. (Wikipedia)*

Signatures (required)

(If requesting computer-related equipment/software, LPC IT Department Review is **required**.)

Requested by  Dean/
Unit Head  IT Department Signature _____
Vice President 

LPC VP Admin. Svcs/President _____ LPC Business Office Use (Account Number) _____

LAS POSITAS COLLEGE Equipment, Apparatus and Service Requisition

#R

#P

Track #

FOR OFFICE USE ONLY

FOR REIMBURSEMENT: List payee name & ssn. **TAX ID#**
 SUGGESTED VENDOR: **FISHER SCIENTIFIC (800-766-7000)**
 NAME OF STAFF MEMBER: **Adeliza Flores** DATE WRITTEN: **10-Mar-11** DIVISION/DEPARTMENT: **CHEM** For inventory purposes include Room # **1802/1805** RETURN COPY OF REQUISITION TO: **L. Camino G. Gire**
 where equipment will reside:

DESCRIPTION (PRODUCT, TYPE, SIZE, COLOR, STOCK NUMBER)	UNIT	QTY	UNIT PRICE	Air
Oven, Lab; Standard; Fisher Scientific Isotemp; Large Model; 5 cubic feet capacity; 120V 60Hz, 11A, 1300w; 140 lb Vendor Catalog # 13247650G		1	\$ 1,339.28	\$ 1,339.28
Clamp, Double-buret; Fisher Scientific; Castaloy; Max. buret O.D.: 0.70 in. (18mm) Vendor Catalog # 00180Q		26	\$ 26.07	\$ 677.82
Stand, Support; Cast-iron base coated with baked asphaltum enamel; Steel support rod; Base: 6 x 9 in.; Rod: 0.5 x 24 in. Vendor Catalog # 7-G16		26	\$ 10.21	\$ 265.46
Burner, Bunsen; For Natural Gas type; Noiseless allow separate control of both flame temperature and flame height; Threaded, aluminum, air control sleeve; Accurately machined, fine pitch; Gas inlet, 8mm (5/16 in.) Vendor Catalog # H-6220/EMD		26	\$ 20.66	\$ 537.16
Fuel Surcharge		1	\$ 4.40	\$ 4.40
Comments:				
INSTRUCTIONAL EQUIPMENT - SPRING 2011				
Please check with Gerry Gire if substitutions are necessary. [BT#]				
Subtotal				\$ 2,824.12
Tax				\$ 0.0975
Shipping (if available):				
TOTAL COST				\$ 3,099.47

Original invoices and receipts must be attached for payment. Include current taxes unless incorporated in price.

ACCOUNT # _____ FUND _____ ORG _____ ACCT _____ PROGRAM _____

Business Office

APPROVALS Real Ely 3/15/2011 Date _____
 Dean _____ VP / President [Signature]

Sales Quotation

Quote Nbr	Creation Date	Due Date	Page
1060-0583-32	03/01/2011		1 of 2
Payment Terms		Delivery Terms	
NET 30 DAYS		DEST	
Valid To		Prepared By	
03/31/2011		SARSON, JAMES E.	
Customer Reference		Sales Representative	
RFQ 3/01/11		JAMES SARSON	
To place an order	Ph: 800-766-7000	Fx: 800-926-1166	
Submitted To:		Customer Account: 948334-001	
ADELIZA FLORES AFLORES@LASPOSITASCOLLEGE.EDU 925-424-1334		LAS POSITAS COLLEGE 3033 COLLIER CANYON RD LIVERMORE CA 94551-9797	



Part of Thermo Fisher Scientific

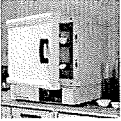



FISHER SCIENTIFIC COMPANY LLC
4500 TURNBERRY DRIVE
HANOVER PARK IL 60133-5491

PLEASE REFER TO THE QUOTE NUMBER ON ALL CORRESPONDENCE

THANK YOU FOR YOUR INTEREST IN FISHER SCIENTIFIC COMPANY LLC

FOR COMPLETE TERMS AND CONDITIONS VISIT OUR WEBSITE AT

www.fishersci.com/salesterms

Nbr	Qty	UN	Catalog Number	Description	Unit Price	Extended Price
1	1	EA	13 247 650G	OVEN ISOTEMP STD 5.0CUFT 120V  Oven, Lab; Standard; Fisher Scientific Isotemp; Large Model; 5 cubic feet capacity; 120V 60Hz, 11A, 1300w; 140 lb. shipping weight; 23-1/2 L x 25-3/4 W x 39-1/4 in. H Vendor Catalog # 13247650G This item is being sold as 1 per each List Price: 2,176.00 CDC: 001	1,339.28	1,339.28
2	26	EA	05 779Q	BURETTE HOLDER, DOUBLE  Clamp, Double-buret; Fisher Scientific; Castaloy; Max. buret O.D.: 0.70 in. (18mm) Vendor Catalog # 00180Q This item is being sold as 1 per each List Price: 54.54 CDC: 005	26.07	677.82
3	26	EA	S47807	IRON SUPPORT STAND 14X23CM  Stand, Support; Cast-Iron base coated with baked asphaltum enamel; Steel support rod; Base: 6 x 9 in.; Rod: 0.5 x 24 in. Vendor Catalog # 7-G16 This item is being sold as 1 per each List Price: 22.35 CDC: 002	10.21	265.46
4	26	EA	S49107	BURNER FOR NATURAL GAS  Burner, Bunsen; For Natural Gas type; Noiseless allow separate control of both flame temperature and flame height; Threaded, aluminum, air control sleeve; Accurately machined, fine pitch; Gas inlet, 8mm (5/16 in.)	20.66	537.16

Sales Quotation



Quote Nbr	Customer Reference	Page
1060-0583-32	RFQ 3/01/11	2 of 2

Nbr	Qty	UN	Catalog Number	Description	Unit Price	Extended Price
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Vendor Catalog # H-6220/EMD
This item is being sold as 1 per each
List Price: 23.00 CDC: 008

MERCHANDISE TOTAL	2,819.72
Fuel Surcharge	4.40
Estimated Sales Tax	275.35
TOTAL	3,099.47

NOTES:

We now offer highly competitive financing with low monthly payments. Please contact your local sales representative for more information.

Tell us about your recent customer service experience by completing a short survey. This should take no longer than three minutes. Enter the link into your browser and enter the passcode: USA-PGH-CS1

<http://survey.medallia.com/fishersci>



Fisher Scientific

Part of Thermo Fisher Scientific

To: ADELIZA FLORES

Date: 03/01/2011

Message: HI ADELIZA,

PLEASE LET ME KNOW IF YOU HAVE ANY QUESTIONS,

THANK YOU,

JAMES

412-490-1217