



**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: Jill Carbone, Gerry Gire, Nan Ho, Barbara Zingg, Ext: 1308

Division/Unit : Biology- MSPES

Brief title of request (equipment or materials being requested must be similar, related or part of a system): set of Student Compound Microscopes

**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	\$59,096.88
Tax (.0975)	\$5,762.06
Shipping	\$250
Installation	\$
Facilities Modification	\$
Other	\$
<b>Total Cost</b>	<b>\$65,108.94</b>

**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:**

Thirty-six Olympus CX31 Microscopes with 4x,10x,40x dry, and 100x oil objective with mount to rotate head. And with reticle micrometer, ocular pointer, cord holder, dust cover and ball-bearing swivel mount. No substitutions.

Is this in your Program Review? Yes  No

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

Our Program Review (and Maintenance Form) states, "We need to provide adequate laboratory supplies, equipment, and technology, including replacements and upgrades.... Student use hands-on learning in biology labs that require access to equipment, technology and supplies.... in order to maintain student access and success, and to meet our department-wide SLO, a one-to-one student-to-microscope ratio is essential..."

As explained below, many microscopes no longer work, which means there is no longer the essential one-to-one student-to-microscope ratio; this impedes student learning.

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

**Please explain?**

Our current models (purchased when the Science Building opened in 1996) are failing. We have scavenged parts to extend their life, but the rate of failure is excessive and has increased rapidly in the last two years. Many microscopes are now out of commission and out of the classroom. We have reached the end of their lifespan; replacement parts are not available.

Below is the evaluation criteria; please see corresponding Instructional Equipment Rubric at:  
[http://grapevine.laspositascollege.edu/pbc/documents/PBCInstructionalEquipmentRubric\\_2010-11.pdf](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?**

These microscopes will have a positive impact on instruction and teaching and learning in the classroom and will be used by instructors and students. Twenty-four of these microscopes will replace a classroom set and 12 will replace microscopes in the Student Workroom. The latter 12 will be pulled into classrooms as necessary to accommodate our frequently over-loaded lab classes or to temporarily take the place of microscopes under maintenance. For example, some sections have 3-5 additional students beyond maximum capacity, therefore requiring more than a class set of 24 microscopes. When two over-loaded lab classes are running concurrently, even more microscopes are taken out of the Student Workroom to maintain the one-to-one student-to-microscope ratio in the lab class.

**Instruction:**

Microscopy is an essential and industry-standard technique for biology. Students in biology must therefore learn how to use and care for microscopes because they will use them in their careers and professions. Every biology class with a lab includes assignments throughout the semester that require a one-to-one student-to-microscope ratio. Some classes require students to use microscopes for the majority of lab sessions to complete assigned work. Each microscope is used up to 15 hours a day by students, causing significant wear and tear on the mechanical systems and optics. Reflecting the importance of microscopy in the biological sciences and Allied Health fields, and as an important tool for scientific inquiry, our departmental SLO is: "Students will be able to manipulate a compound microscope and demonstrate knowledge of its parts and uses."

**Teaching and Learning:**

Microscopes allow students to reinforce lecture with hands-on learning experiences. Some examples include: learning differential identification of microorganisms, determining the size of microscopic organisms, observing living specimens, viewing physiological processes, manipulating organisms experimentally, and identifying human, plant and animal tissues (both normal and pathological.) These lab outcomes are part of individual Course Outlines and Course Objectives. Microscopy is also used for inquiry-based activities and problem solving (for example, using staining techniques to identify an unknown pathogen, or determining the osmotic effects of different solutes on cells, tissues and organisms.)

These microscopes will be equipped with a reticle micrometers and ocular pointers to facilitate teaching and learning. When students have a question about what they see in their ocular view, they can use the ocular pointer to easily communicate and indicate the relevant structure to the instructor, which aids in teaching. Another teaching and learning strategy is for instructors to use the reciprocal technique and assess student learning about processes that students view.

Twelve of these scopes will be used to replace non-functioning microscopes in the Student Workroom (1806). Students log more than 2,500 hours per year in this room working on projects, with substantial time reviewing microscope slides for lab practical exams. There are up to a dozen students needing access to compound microscopes at the same time. These Student Workroom microscopes are used up to 15 hours a day by students, causing significant wear and tear to mechanical parts and optics.

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

Biology courses are full, or over-loaded, so we can not increase the number of students or attract new students to our program until the new Science Building is completed. However, we do impact enrollment slightly by minimizing attrition in our program. We do this by offering hands-on experiences and success with microscopes from the very first day of lab. This positive feedback instills student confidence, enthusiasm, and buy-in to the lab experience, especially since most of our courses start the semester with a microscopy lab that highlights the students' own living cells.

Our focus is to create a lab environment where learning is maximized with the best technology and access to equipment. Student continually create demand for our courses based on the quality of instruction and access to industry-standard equipment. One hallmark of our program is our focus on hands-on learning of skills that students will need in their educational and career pathways.

**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?**

There are two Student Learning Outcomes that apply to all biology lab courses and require microscopes. We have several semesters of SLO assessment data and have held multiple trainings for faculty and staff to support this SLO.

- 1) Students will be able to properly manipulate a compound microscope and demonstrate knowledge of its parts and uses.
- 2) Students will gain hands-on experience with and demonstrate proficiency in standard biological techniques, using industry-level biology laboratory equipment and/or discipline-specific computer hardware and software.

Individual classes may have more specific SLOs that require higher levels of microscope proficiency. For example, an SLO in Zoology 1 is: "Optimizing magnification, lighting and focus for any given specimen." Students can only meet this SLO with constant access to microscopes, allowing extensive practice responding to the unique characteristics of every slide.

The requested microscopes are essential for fulfilling all of the above SLOs. If students have to share a microscope, this affects student learning, since half of the time a student will not have access to the microscope. Some students routinely defer to a lab partner when using shared microscopes. Microscope-averse students tend to struggle with science classes, are less confident with mechanical manipulations, and tend to be female. Student success during SLO assessment depends on students having had a lot of practice with microscopes. Less access and decreased confidence with the microscope can create a student disengaged in learning. Students working independently on their microscope assures equity in access.

In reference to the first SLO above, when students do not have proper access to microscopes they will not learn how to properly manipulate the instrument and will be less familiar with its parts and uses. One required adjustment on the compound microscope is focusing the condenser lens via the condenser adjustment knob. The majority of the broken parts on our failing scopes involve the condenser adjustment knob. It is now impossible to focus the condenser, so students will not be able to meet this outcome. The replacement parts for the condenser adjustment knob have been discontinued. Another required adjustment is using the stage clips, which are bent on many of the microscopes, causing glass shards to form and preventing students from moving and effectively focusing the slide. The microscope repair vendor has informed us that some parts have been discontinued, making repair unlikely. A third microscope adjustment is fine focus using high magnification (400x or 1000x). Some of the failing microscopes have degraded optics, which makes it impossible to focus, further frustrating students because they cannot succeed in examining a specimen.

In reference to the second SLO, hands-on experience with an industry-standard technique (microscopy), will be reduced by half for students who do not have access to their own microscope.

When we have two over-loaded classes running concurrently (for example with 25-30 students each), this requires removing a few to many of the dozen microscopes from the Student Workroom. This negatively impacts students who are working in the Student Workroom (there may be up to a dozen students in the Student Workroom at a time) when classes are using microscopes.

We will continue to keep in service any older microscopes that we can piece together from salvaged parts.

**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) 15 years is the estimated lifespan based on how long our current microscopes have lasted. There is some extension of lifespan of individual microscopes towards the end of this time period because some parts can be scavenged from one microscope to replace worn out or broken parts, but this reduces the overall number of functioning microscopes.

b) The microscopes will be stored in the existing, designated cupboards in the labs and 1806. There is no storage problem.

c) There are no on-going operating costs.

d) We have a service contract that charges \$40 per microscope once a year for a thorough cleaning. For 36 microscopes this would cost \$1,440 per year.

**Health and Safety (Total = 2 points)**

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

Because we are significantly short on microscopes in the Student Workroom, students have been standing around waiting for the next microscope to become available. The bunching of waiting students creates safety concerns for prep room staff trying to move carts in and out of labs safely, as well as other students trying to leave and pass around the bunch of students.

Due to several bent slide clips, small glass shards form from slides and can irritate skin.

We chose to purchase microscopes with ball-bearing swivel mounts based on our previous experience with other models without this feature. In those cases, the swivel head of the microscope falls off the microscope easily, damaging the microscope and potentially dropping a large metal object on a student.

**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 one-to-one student-to-microscope ratio that our Biology program offers provides outstanding hands-on learning that brings recognition to our program and attracts students to LPC. This experience provides students with industry-standard techniques, which they can use to in their transfer, career technical, or professional careers.

LLNL has donated funds to create a state-of-the-art LENS Digital Microscope Station, which will be housed in the Student Workroom and allow students to take high-resolution digital images of microscopic specimens. There is no other community college that we know of that has this equipment easily available to students. These images can be used by students for studying for practical exams, adding data to reports, and developing their own portfolio of images. To be a good steward of this substantial financial investment from our community, LPC must continue to ensure students are properly and extensively trained in the use and care of a compound microscope.

**Commitment to Sustainability (Total = 1 point)**

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

The Biology program has developed a culture of microscope care. This includes: Microscope Checklists, Microscope Responsibility Forms (requiring student acknowledgement and signatures), point values assigned to microscope care and use, SLO assessments, and faculty and staff workshops on teaching/assessing the microscope SLO. These help to ensure the sustainability of the microscopes and prolong their life for as long as possible.

Another way to support sustainability is our department's practice of regular maintenance, timely repair, and quick turn-around of microscopes back into the classroom. These practices result in a higher effective number of microscopes in actual use by students. Additionally, we scavenge old parts off non-functioning microscopes in order to stretch the lifespan of remaining microscopes.

**Access (Total = 1 point)**

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

In order to accommodate visual learners, we provide microscopy to reinforce lecture content. Microscopes often bridge the gap for students who have a hard time conceptualizing lecture material. In order to accommodate disabled students with impaired vision, the best available optics and technology help maximize their access.

Kinesthetic activities, such as using a microscope, are a powerful tool in learning science. When access to microscopes is limited or non-existent, active hands-on learning is negatively affected.

These microscopes are ergonomically designed to reduce fatigue and adjust to accommodate physical disabilities.

As mentioned in a previous section, some students tend to defer to a lab partner when using shared microscopes. Microscope-averse students often struggle with science classes, are less confident with mechanical manipulations, and tend to be female. Less access and decreased confidence with the microscope can create a student disengaged in learning. Students working independently on their microscope assures equity in access.

*\*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

TAX ID#

SUGGESTED VENDOR: **Olympus (800-446-5967)**

NAME OF STAFF MEMBER: **J. Carbone** DATE WRITTEN: **7-Mar-11** DIVISION/DEPARTMENT: **Biology** For inventory purposes include Room # \_\_\_\_\_ where equipment will reside: \_\_\_\_\_

RETURN COPY of REQUISITION TO:

**L. Camino G. Gire**

DESCRIPTION (PRODUCT, TYPE, SIZE, COLOR, STOCK NUMBER)	UNIT	QTY	UNIT PRICE	Air
Olympus CX31 Microscopes with 4x, 10x, 40x dry and 100x				-
CX31R-OA1-1-5; CX31 SET BI (4/10/40//100X0B, EYEP, STG, PWR, BULB)	EA	36	\$ 1,964.00	\$ 70,704.00
Cord Holder Item # C-0900	EA	36	\$ 19.00	\$ 684.00
Pointer eyepiece pointer Item # B-0681	EA	36	\$ 3.00	\$ 108.00
Micrometer Disc Item # B-L0501	EA	36	\$ 55.00	\$ 1,980.00
Swivel Mount Item # OLPI-CXS	EA	36	\$ 280.00	\$ 10,080.00
Eyepiece Micrometer Holder Item # Z-BA052	EA	36	\$ 23.00	\$ 828.00
Dust cover, hood type Item # COVER015	EA	36	\$ 10.00	\$ 360.00
Taxes	EA	1	\$ 5,762.06	\$ 5,762.06
Shipping and Handling Charge	EA	1	\$ 250.00	\$ 250.00
<b>INSTRUCTIONAL EQUIPMENT REQUEST</b>				
<b>Comments:</b>				
<b>Quote BIO-09801719 (attached)</b>				
Subtotal				\$ 90,756.06
Tax				\$ -
DISCOUNT				\$ (25,647.12)

**BT#**

TOTAL COST \$ **65,108.94**

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

ACCOUNT # \_\_\_\_\_

FUND \_\_\_\_\_ ORG \_\_\_\_\_ ACCT \_\_\_\_\_ PROGRAM \_\_\_\_\_

Business Office

APPROVALS

*Head Ely* 3/15/2011  
Date

*[Signature]* 3/17/11  
VP / President



# OLYMPUS

## Olympus America Inc.

SEG Biological Microscopes

3500 Corporate Pkwy.

Center Valley, PA 18034

Phone: 800-446-5967

Fax: 484-896-7177

www.olympusamerica.com

Quote #: **BIO-09801719**      **Olympus CX31 with 4x,10x,40x dry 100x oil mount to rotate head**      **2/2/2011**

Gerry Gire  
Las Positas College

Livermore, CA 94550  
Phone: 925-424-1331

Fax:  
Email: ggire@laspositascollege.edu

Sales Rep: Rick Staples  
Phone: (415) 250-6505  
Email: rick.staples@olympus.com

Item Number	Description	Qty	List Price	Extended Price
CX31-105	CX31R-OAI-1-5;CX31SET BI,4/10/ 40/100XOB,EYEP, STG,PWR,BULB	36	1,964.00	47,371.68
C-0900	CH3-CH;CORD HOLDER FOR CH30 STUDENT MICROSCOPE	36	19.00	458.28
B-0681	POINTER;EYEPIECE POINTER WITHSHARPENED POINTS FOR CH2,CH30	36	3.00	72.36
B-L0501	20.4OCM10/100;20.4MM DIA,MICROMETER DISC,10MM/100 UNITS	36	55.00	1,326.60
OLPI-CXS	LPI-CXS;BX/CX SWIVEL MOUNT	36	280.00	9,072.00
Z-8A052	20.4-RH; EYEPIECE MICROMETER HOLDER FOR WHB10X EYEPIECES	36	23.00	554.76
COVER015	COVER015: DUST COVER, HOOD TYPE FOR CX2 MICROSCOPES	36	10.00	241.20
TAX	<*-DESCRIBE TAX-*>		5,762.06	5,762.06
SHIPHAND	SHIPPING AND HANDLING CHARGE	1	250.00	250.00
<b>TOTAL LIST PRICE</b>				<b>90,756.06</b>
<b>DISCOUNT</b>				<b>25,647.12</b>
<b>LINE ITEM TOTAL</b>				<b>65,108.94</b>

Quotation is valid 90 days.

Payment terms: Net 30

Pricing Condition: FOB Origin

To order these services or equipment fax 484-896-7177 or email seg.orders@olympus.com.

### Terms and Conditions

This is an official price quotation for the products which you have shown an interest to purchase. The prices listed in this quotation as well as any package pricing, apply to the entire quote as presented. Changes, additions or deletions from this quotation may result in pricing

# OLYMPUS

## Olympus America Inc.

SEG Biological Microscopes

3500 Corporate Pkwy.

Center Valley, PA 18034

Phone: 800-446-5967

Fax: 484-896-7177

[www.olympusamerica.com](http://www.olympusamerica.com)

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Quote #: **BIO-09801719**

**Olympus CX31 with 4x,10x,40x dry 100x oil mount to rotate head**

**2/2/2011**

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adjustments. Catalog numbers may change from time to time.

Freight and Insurance will be added at time of shipping. Sales tax may be added, if applicable. An exemption certificate is required to demonstrate tax exempt status.

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Olympus America Inc. Warranty ([http://www.olympusamerica.com/seg\\_section/seg\\_service.asp?fl=3](http://www.olympusamerica.com/seg_section/seg_service.asp?fl=3))

\* Standard products: 5 years for mechanical and optical defects; 1 year for electrical, electronic, and wear-related components.

\* Fluoview Systems: 1 year for mechanical and optical defects; 1 year for electrical, electronic, and wear-related components.

\* MIC-D Digital Microscope: 1 year for defects in materials and workmanship.

Third-party products are covered under their manufacturers' respective warranties.