

ANTELOPE VALLEY COMMUNITY COLLEGE DISTRICT NOTICE INVITING PROPOSALS  
NOTICE IS HEREBY GIVEN THAT ANTELOPE VALLEY COMMUNITY COLLEGE DISTRICT, 3041  
WEST AVENUE K, LANCASTER, LOS ANGELES COUNTY, CALIFORNIA 93536-5426, ACTING BY  
AND THROUGH ITS GOVERNING BOARD, HEREINAFTER REFERRED TO AS THE DISTRICT, WILL  
RECEIVE UP TO, BUT NO LATER THAN 10:00 A.M. PST, MONDAY, JANUARY 6, 2014 ELECTRONIC  
PROPOSALS FOR THE AWARD OF A CONTRACT FOR: HEALTH & SCIENCE BUILDING  
MICROSCOPES PROPOSAL # AVC2013/2014-2. ALL PROPOSALS SHALL BE MADE ON A FORM  
FURNISHED BY THE DISTRICT. PROPOSALS SHALL BE RECEIVED ELECTRONICALLY BY  
PURCHASING@AVC.EDU. EACH PROPOSAL MUST CONFORM AND BE RESPONSIVE TO THE  
CONTRACT DOCUMENTS WHICH MAY BE OBTAINED FROM:  
WWW.AVC.EDU/ADMINISTRATION/BUSSERV/REQUESTFORPROPOSALSPROPOSALDOCUMENTS.  
HTM. THE DISTRICT RESERVES THE RIGHT TO REJECT ANY AND ALL PROPOSAL OR TO WAIVE  
IRREGULARITIES TO ANY PROPOSAL. QUESTIONS ON PROPOSAL MAY BE DIRECTED TO  
ANGELA MUSIAL AT [AMUSIAL1@AVC.EDU](mailto:AMUSIAL1@AVC.EDU). STEVE BUFFALO, CLERK, BOARD OF TRUSTEES,  
ANTELOPE VALLEY COMMUNITY COLLEGE, PROPOSAL # AVC2013/2014-2, PUBLISH: 12/14/13,  
12/21/13, & 12/28/13

**Two-Step Sealed Formal Bid**

**BID Number AVC 2013/2014 – 2**

**Health & Science Microscopes**

**Antelope Valley Community College District  
3041 West Avenue K  
Lancaster, CA 93536-5426**

**Issue Date: December 14, 2013**

**Step 1 of Bid Due Date/Time: January 6, 2014, 10:00 a.m. PST**

**OFFICE OF ADMINISTRATIVE SERVICES**

To: Bidders

From: Diana Keelen  
Executive Director of Business Services

Subject: Bid Number AVC2013/2014 -2  
Health & Science Microscopes

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**This is a Two-Step Formal Sealed Bid. Enclosed is a copy of Step One of the Bid Documents for:**

Health & Science Microscopes, Bid Number AVC2013/2014 -2

The process of the Two-Step Formal Sealed Bid is as follows:

**Step One**

Step one consists of the request for, submission, evaluation, and (if necessary) discussion of a technical proposal. **No pricing is involved.** The objective is to determine the acceptability of the supplies or services offered.

Included in this RFP for each item is a description of the equipment/service required (course name, general course description and lab course objectives also included), quantity, and scoring rubric. A scoring rubric has been included because evaluation criteria other than price are being considered in the review process. Criteria listed on the scoring rubric will be used to assess each proposal submitted.

Proposals submitted are to include: (1) Specifications of equipment/service that meet the enclosed requirements while taking into account the evaluation criteria listed in the enclosed rubric, (2) a minimum of three references, (3) extensive warranty information, and (4) a delivery schedule. Vendors should submit proposals that are acceptable without additional explanation or information. Vendors may submit more than one proposal.

**Proposals must be received electronically by [purchasing@avc.edu](mailto:purchasing@avc.edu) no later than 10:00 a.m. PST on Monday, January 6, 2014. Include the RFP # and Vendor name in the subject line of the e-mail. Proposals received after the date/time above will not be considered.**

**Do NOT include pricing in your proposal. Vendors who submit proposals with pricing may be considered non-conformant with the RFP.**

Vendors who submit proposals will be scheduled to demonstrate all of the proposed equipment for a minimum of two days from January 13-16, 2014. A representative from the Vendor must be present to setup/take down equipment and answer any questions for a minimum of 5 hours on each scheduled day. Not participating or meeting the requirements of the demonstration may result in non-conformance of the bid.

The technical team will assess each submitted proposal according to the criteria listed on the Rubric, then down select to no less than two vendors. Those Vendors will proceed with step two of the formal

sealed bid process. Vendors not selected to proceed with step two will be debriefed by the Purchasing Department and a member of the technical team.

**Step Two**

Step two involves the submission of sealed priced bids. Only bids based upon technical proposals determined to be acceptable, either initially or as a result of discussions, will be considered for awards. Each bid in the second step must be based on the bidder's own technical proposals. Sealed priced bids submitted in step two are evaluated and the awards made.

When requested, Vendors will submit sealed priced bids to the address below. The sealed bids must be clearly labeled with the RFP #, AVC2013/2014-2 and received no later than 5 business days from the date requested (due date and time will be clearly defined in step two of the bid documents).

Antelope Valley College  
ATTN: Purchasing Office  
3041 West Avenue K  
Lancaster, CA 93536

Purchasing will perform a public bid reading of received sealed bids on the date/time specified in part two of the bid documents. The District reserves the right to make multiple awards or no award at all.

Purchasing will forward a contract to the awarded Vendor(s) to be signed and returned within 5 business days. A recommendation to award the selected Vendor(s) will be submitted for the next scheduled board meeting.

If you intend to bid, additional copies of the Bid Documents may be obtained from the Purchasing website, [www.avc.edu/administration/busserv/RequestforProposalsBidDocuments.htm](http://www.avc.edu/administration/busserv/RequestforProposalsBidDocuments.htm), or the Purchasing Office, Room A149, at Antelope Valley College.

**Proposal submitted for step one of the Two-Step Sealed Bid must be received electronically by purchasing@avc.edu no later than 10:00 a.m. PST on Monday, January 6, 2014. Include the RFP # and Vendor name in the subject line of the e-mail. Proposals received after the date/time above will not be considered.**

Excessive exceptions to the terms and conditions listed in this Request for Proposal may result in non-conformance of bid.

Questions regarding this RFP may be referred to Angela Musial, Buyer, using Appendix B and faxing them to (661) 722-6320.

AAM  
Encl

# **INSTRUCTIONS FOR BIDDERS**

## **Antelope Valley Community College District**

### Health & Science Microscopes

#### INSTRUCTIONS AND CONDITIONS - BID NUMBER AVC2013/2014 -2

##### **1. PREPARATION OF BID FORM**

Bids must be submitted in ink or typewritten. All blanks in the bid form must be appropriately filled in. Both unit price and extension (where applicable) for all line items must be shown where required on the bid form. Prices should be stated in units specified hereon. Prices should reflect all delivery and installation charges.

**Do NOT include any pricing in Step One of the Two-Step Sealed Formal Bid.**

All bids for step one must be submitted electronically to [purchasing@avc.edu](mailto:purchasing@avc.edu) by the specified due date and time. Include the RFP # and Vendor name in the subject line. It is the sole responsibility of the bidder to see that the bid is received in proper time. Any bid received after the due date and time will not be considered.

##### **2. ERRORS AND CORRECTIONS**

No erasures permitted. Mistakes may be crossed out and corrections made adjacent but must be initialed in ink by person signing the bid. Verify your bids before submission as they cannot be withdrawn or corrected after being opened.

##### **3. SUBSTITUTIONS AND SAMPLES**

All items bid must conform to the specifications set forth in these bid documents. The District reserves the right to reject all bids that do not conform to the specifications. When bidding on brands other than those specified, the Bidder must state on the bid the brand, quality, model number, or other trade designation on each item bid other than "as specified". See the attached documents for requirements regarding samples and/or detailed specification sheets. At a minimum, descriptive technical literature fully describing the claimed 'or equal' product must be attached to the bid. Suitability and valuation of 'equals' rests in the sole discretion of the District. Where samples are requested they must be furnished free. Samples will be returned at bidder's expense provided a request accompanies the samples and provided further that samples are not destroyed by tests.

##### **4. SALES TAX**

Please include any California State Sales or Use Taxes in your total on the Bid Proposal form. Do not include or add Federal Excise Tax, as the District is exempt. On the specification sheets, please list unit and extension prices without tax.

**Do NOT include any pricing in Step One of the Two-Step Sealed Formal Bid.**

##### **5. FAILURE TO BID**

If you do not bid on any line item, please mark "no bid" in the space provided and sign it and return the bid, otherwise your name may be removed from the bidder's list.

##### **6. ACCEPTANCE OF BIDS**

Awards will be made on a unit and line item basis unless otherwise specified on bid form. The right is reserved to reject any or all bids and to accept or reject any line items thereon and to make any combination of line item awards. Bids may be rejected on grounds of non-responsiveness or non-responsibility. Bids are subject to acceptance at any time within ninety (90) days after opening unless otherwise stipulated.

##### **7. PATENTS, ETC.**

The vendor shall hold the District, its officers, agents, servants, and employees harmless and free from liability of any nature or kind on account of use (by publisher, manufacturer, or author) of any copyrighted or non-copyrighted composition, secret process, patented invention, article or appliance furnished or used under this bid.

#### **8. FAILURE TO FULFILL CONTRACT**

When any contractor or vendor fails to deliver any article or service or delivers any article or service which does not conform to the specifications, the District may, at its sole discretion, annul and set aside the contract with said vendor or contractor, either in whole or in part, and make and enter into a new contract for the same items in such manner as seems to the Board of Trustees to be in the best interest of the District. Any failure for furnishing such articles or services by reason of the failure of the vendor or contractor, as above stated, shall be a liability against such vendor and the vendor's sureties. The Board of Trustees reserves the right to cancel any articles or services which the successful bidder may be unable to furnish because of economic conditions, governmental regulations or other similar causes beyond the control of the bidder provided satisfactory proof is furnished to the Board of Education, if requested.

#### **9. BID SIGNATURES**

All bids must show the firm name and must be signed in ink by a responsible officer or employee fully authorized to bind the organization to the terms and conditions herein. Obligations assumed by such signature must be fulfilled.

#### **10. CANCELLATION FOR INSUFFICIENT OR NON-APPROPRIATED FUNDS**

The bidder hereby agrees and acknowledges that monies utilized by the District to purchase the items bid is public money appropriated by the State of California or acquired by the District from similar public sources and is subject to variation. The District fully reserves the right to cancel this bid at any time and/or to limit quantities of items due to non-availability or non-appropriation of sufficient funds.

#### **11. REQUIRED DELIVERY DATES (RDD)**

Actual delivery of the equipment or services shall be coordinated with the District or contractor designated by the District but shall not exceed the required delivery dates (RDD) specified on the bid form for each particular product. The District, as a matter of bid non-responsiveness, shall reject all bids (regardless of price) that fail to indicate ability to deliver the product within the required time. Give careful attention to any Required Delivery Dates (RDD) included in the Specifications or Special Conditions. Upon award of bid, supplier shall keep sufficient stocks of product and service material to insure prompt delivery and service schedules. There shall be no minimum quantities required in order for the District to place orders for needed items. Bid all items F. O. B. shipping point, and specify freight as a non-taxable line item unless otherwise directed.

#### **12. PAYMENT**

Prompt payment for equipment or services may be requested after actual delivery of goods to the required destination as outlined in the REQUIRED DELIVERY DATES (RDD) conditions. Payment for service contracts may be invoiced per the conditions set forth and agreed to in the service agreement.

#### **13. STANDARD COMMERCIAL USE (Products Only)**

The vendor, whether manufacturer, supplier, distributor or retailer, hereby certifies that the products offered under this bid have been placed in regular commercial use for a period of at least three (3) years and that adequate spare parts exist in the marketplace for the items sold. Submit all requests for deviations to this clause as and/or equal deviation.

#### **14. HOLD HARMLESS**

The vendor shall save, defend, hold harmless and indemnify the District against any and all liability, claim, and costs of whatsoever kind and nature for injury to or death of any person and for loss or damage to any property occurring in connection with or in any way incident to or arising out of the occupancy, use, service, operations, or

performance under the terms of this contract, resulting in whole or in part from the negligent acts or omissions of vendor, and subcontractor, or any employee, agent, or representative of vendor and/or subcontractor.

#### **15. NON-DISCRIMINATION**

Antelope Valley College prohibits discrimination and harassment based on sex, gender, race, color, religion, national origin or ancestry, age, disability, marital status, sexual orientation, cancer-related medical condition or genetic predisposition. Upon request, we will consider reasonable accommodation to permit individuals with protected disabilities to (a) complete the employment or admission process, (b) perform essential job functions, (c) Enjoy benefits and privileges of similarly situated individuals without disabilities and (d) participate in instruction, programs, services, activities or events.

#### **16. AWARD OF BID**

Award of this bid shall be made by individual line item or groups of line items to the lowest-priced responsible bidder (for each item or group) who is fully responsive to the terms of this solicitation. A bidder must deliver the items within the required delivery date (RDD) in order to be declared responsive to this bid. The District may consider prompt payment discounts (only terms of 2%30 days or better will be considered) and other rebates offered on the bid form in determining lowest net cost.

The District also reserves the right to make multiple awards or no award at all and further reserves the right to reject any and all bids and to waive any irregularity or discrepancy associated with this bid.

**Do NOT include any pricing in Step One of the Two-Step Sealed Formal Bid.**

#### **17. WARRANTY/QUALITY**

The supplier, manufacturer or assigned agent shall guarantee the product or service performed against all defects or failures of materials and workmanship for minimum period of one (1) year from the actual delivery date. Where applicable, all merchandise must be warranted to be in compliance with California energy, conservation, environmental, educational, and product liability standards.

#### **18. AGREEMENT**

The Agreement form included in the Bidder's Packet is for your information only. After the award of the Bid by the Board, an Agreement form will be sent to the awarded Vendor(s). This form must be completely filled out, signed and returned within 5 days of receipt of the form.

#### **19. PRICING- TERM OF CONTRACT**

Minimum contract term is six (6) months. Quoted prices must stay in effect for six (6) months after award of bid and may be extended upon mutual consent of College and vendor for an additional two (2) six month periods in accordance with provisions contained in the Education Code, Sections 39644 (K-12) and 81644 (Community Colleges). A maximum price increase of 5% per contract term may be negotiated subject to existing market conditions. In the event of a general price decrease the District reserves the right to revoke the bid award unless the decrease is passed on to the District.

**Do NOT include any pricing in Step One of the Two-Step Sealed Formal Bid.**

#### **20. MULTI-YEAR EXTENSIONS**

Subject to the provisions of Paragraph 18 (above), and pursuant to Education Code, Sections 39644 and 81644, this bid may be extended (by mutual consent expressed in writing) for two (2) additional six-month increments (total potential bid life of 18 months from Board of Trustee award).

#### **21. NO MINIMUM OR MAXIMUM QUANTITIES, ORDER CHARGES, OR LIMITATIONS UPON NUMBER OF ORDERS**



The District anticipates contract term requirements for the supplies and commodities as listed in the quantities shown on the bid form. The District, however, does not guarantee orders in these amounts nor shall the District be required to limit its orders to only those figures. This is an indefinite-quantity bid. Bidders shall not specify minimum or maximum quantities or charges for specific order types. Unlimited orders within the term of the contract shall be allowed by the District at the prices quoted.

**22. INTENT TO RESPOND**

See Appendix A – Intent to Respond Form.

**23. QUESTIONS REGARDING BID OR SPECIFICATIONS**

To ensure fairness throughout this process, direct all questions about the bid or specifications on the form attached as Appendix B.

**24. PIGGYBACK CLAUSE**

For the term of the contract and any mutually agreed extensions pursuant to this bid, **at the option of the vendor**, other Community Colleges, public corporation or agency (including any county, city, town or public corporation or agency within the State of California) may purchase, lease-purchase, or rent the identical item(s) at the same Price and upon the same terms and conditions pursuant to sections 20118 (K-12) and 20652 (Community Colleges) of the Public Contract Code.

The District waives its right to require such other Colleges and offices to draw their warrants in the favor of the District as provided in said Code sections.

**Acceptance or rejection of this clause will not affect the outcome of this bid.**

**Health & Science Microscopes, Bid Number AVC2013/2014 -2**

Piggyback option granted: \_\_\_\_\_

(Please initial)

Piggyback option not granted: \_\_\_\_\_

**Exclusions:**

## GENERAL CONDITIONS

### **NAME AND LEGAL ENTITY**

The bidder shall specify in the bid the name and nature of its legal entity and any fictitious name under which it does business in relationship to this bid. The bid shall be signed under the correct firm name by an authorized officer or person. Obligations assumed by such signature must be fulfilled and are legally binding.

### **ASSIGNMENT OF PURCHASE ORDER**

The supplier shall not assign or transfer by operation of law or otherwise any or all of its rights, burdens, duties or obligations without prior written consent of the Board of Trustees of the District.

### **PRICES**

Prices shall be printed or typewritten. No erasures are permitted. Mistakes may be crossed out and corrections printed adjacent and must be initialed in ink prior to the bid opening by the person signing the bid or by the bidder's authorized representative. Bids should be verified before submission, as they cannot be withdrawn after acceptance. Prices must be stated in units specified hereon and wherever possible should be net including all discounts. Cash discounts will be computed from date of acceptance of merchandise or date of receipt of the invoice, whichever is later. If tests are necessary, discount will be figured from date of approved test report.

**Do NOT include any pricing in Step One of the Two-Step Sealed Formal Bid.**

### **BRAND NAME AND MODEL NUMBER – SAMPLES**

The bidder shall state the brand name and model number of materials to be provided. If none is indicated, it shall be understood that the bidder is quoting on the exact brand and model number specified on the bid form. Substitute brands may be accepted at the District's sole discretion if deemed equal in all respects to that specified. If a Manufacturer feels that their product is equal to the specified systems, they shall submit product brochures, specification manuals, photographs, finish samples and all other materials required to establish equality to the District for consideration and approval as an equal. All samples are to be furnished at no expense to the District. Such samples, if not destroyed by tests, will become the property of the District, unless otherwise requested at time of delivery of said samples. Any samples returned shall be at bidder's liability and at bidder's expense.

### **DOCUMENTS**

The entire bid package is the purchase agreement which includes the advertisement, the bid, general and special conditions, information to bidders, the drawings and specifications, if any, the contract, purchase order, any addenda, as issued and any special instructions.

### **ACCEPTANCE OR REJECTION OF BIDS**

The District may issue a contract or purchase order or both on an individual item or combination of items, whichever is to the best interest of the District. Bids shall remain open and valid and subject to acceptance for sixty (60) days following the bid opening date unless otherwise specified in the bid documents.

### **DELIVERY AND INSTALLATION**

It is understood and the bidder agrees to deliver prepaid and to install all items on which bids are accepted to the address or location indicated on the bid form. All costs for delivery, drayage, freight, storage, assembly, installation or backing of said articles reflected in this offer are to be borne by the bidder.

All shipments shall be accompanied by a packing slip and, if applicable, the purchase order number shall appear on all cases and packages. Payment for unauthorized partial deliveries will not be made until entire contract has been completed.

**INSPECTION AND DEFAULT**

All articles furnished shall be subject to inspection by representatives of the District for defects or non-compliance with specifications.

**HOLD HARMLESS CLAUSE**

The supplier shall hold the District and its Board of Trustees, officers and employees harmless from liability of any nature or kind on account of:

- 1.) Use of any copyrighted or uncopied composition, secret process, patented or unpatented invention, article or appliance furnished or used under the contract, however caused.
- 2.) Any injury to person or persons or property sustained by the supplier or by any person, firm or corporation, employed directly or indirectly by the contractor upon or in connection with the performance under the contract, however cause.

The supplier, while engaged in carrying out the terms and conditions of the contract, is an independent contractor and not an officer or agent of the Board of Trustees. The supplier shall maintain adequate insurance to protect all interests.

The supplier, at its own expense and risk, shall defend any legal proceeding that may be brought against the District of Board of Trustees, its officers and employees or any such claim or demand and satisfy any judgment that may be rendered against any of them.

**INVOICES AND PAYMENT**

Unless otherwise specified, the VENDOR shall render invoices for goods or services provided to the Accounts Payable Office at the address listed on the Purchase Order or by e-mail to [accounts\\_payable@avc.edu](mailto:accounts_payable@avc.edu). All invoices must indicate the assigned Purchase Order number. Invoices must also conform to the line items and unit prices in the Purchase Order. Unless otherwise noted, the DISTRICT shall make payments on a net-30 day basis or within a reasonable time after VENDOR has completed its obligations hereunder and payment approval is granted by the authorized DISTRICT Representative. The DISTRICT may also require the submittal of an IRS Form W-9 for taxpayer identification. Any monies due the DISTRICT from VENDOR can be set off from any monies due VENDOR from the DISTRICT whether or not under the Purchase Order.

**LIQUIDATED DAMAGES AND FINAL PAYMENT**

Acceptance by the Supplier of said final payment shall constitute a waiver of all claims against the District arising from this contract.

The title to new materials and/or equipment, and the attendant liability for its protection and safety, shall remain with the Supplier until set in place and accepted by the District. No part of said materials or equipment shall be removed from its place of storage except for immediate installation in place as directed herein. Supplier shall keep an accurate inventory of all materials and equipment in a manner satisfactory to the District. Said inventory shall be available for inspection by the District at any time during the contract.

**PAYMENTS WITHHELD**

In addition to any amounts which the District may retain above, the District may withhold a sufficient amount or amounts of any payment or payments otherwise due to Supplier, as in the District's judgment may be necessary to cover:

- a) Defective work not remedied.
- b) Failure of Supplier to make proper payments to his supplier(s) provided that the District has received, according to law, a California 20-day Preliminary Notice from such supplier.
- c) Completion of the contract, if there exists a reasonable cause to believe that the supplier is unable or unwilling to do so.

- d) Damage caused by the Supplier.
- e) Liquidated damages.

When the above grounds are removed, payment shall be made for amounts withheld because of them.

The District may apply such withheld amounts to payments of such claims or obligations at the District's discretion. In doing so, the District shall be deemed the agent of the Supplier and any payments so made by the District shall be considered as a payment made under this contract by the District to the Supplier. The District shall not be liable to the Supplier for such payments made in good faith. Such payments may be made without prior judicial determination of claim or obligations. The District will render Supplier a proper accounting of such funds disbursed on behalf of the Supplier.

### **MINIMUM QUALIFICATIONS**

Each person or firm submitting a bid for consideration of award must meet the following minimum qualifications:

- 1.) Five (5) years in business, with at least 2 years in the same location.
- 2.) Be an authorized dealer, installer, distributor or representative from the original manufacturer of all items bid.

### **PROOF OF CARRIAGE OF INSURANCE**

Awarded Bidder shall not commence work nor shall he allow any subcontractor to commence work under this contract until he has obtained all required insurance and certificates, which have been delivered in duplicate to and approved by the District.

- a) Certificates and insurance policies shall include the following clause: "This policy shall not be cancelled or reduced in required limits or liability or amounts of insurance until notice has been mailed to the District."
- b) Certificates of insurance shall state in particular those insured, extent of insurance, location and operation to which insurance applies, expiration date and cancellation and reduction notice.
- c) Certificates of insurance shall clearly state that the District is named as an additional insured under the policy described and that such insurance policy shall be primary to any insurance or self-insurance maintained by the District.

### **INSTALLATION PLAN AND SCHEDULE**

Within 5 days of notification of award, the successful bidder(s) shall be required to submit a written plan and schedule for approval by the District which shall include, but not be limited to, details regarding:

- a) Order dates and procedures
- b) Expected delivery dates and shipping information
- c) Checking and receiving procedures
- d) Storage capability and location(s)
- e) Assembly, installation and set up procedures
- f) Manpower expectations
- g) Repair provisions

Failure to provide a plan may be considered grounds for termination as prima facie evidence that the bidder refuses to perform per paragraph 11 of Information to Bidders. District reserves the right to reject unreasonable or inappropriate plans. Any plan so rejected, may be modified and resubmitted within 5 calendar days for reconsideration. Rejection of the second resubmitted plan shall be grounds for termination as prima facie evidence that the bidder refuses to perform per Paragraph 11 of Information to Bidders. District agrees that approval shall not be unreasonably withheld. Approved plans shall become, by reference, incorporated herein and shall be enforced as part of this contract.

## SPECIAL CONDITIONS

The terms "District" as used herein shall be deemed to mean the Antelope Valley Community College District or its representative and governing board.

The terms "Contractor", "Bidder", "Vendor" or "Supplier" as used herein, shall be all deemed to mean the person or firm submitting the bid or its employees, representatives or sub-contractors.

Brand names, where specified, are included to indicate type and quality desired. If a manufacturer feels that their product is equal to the above systems, they shall submit product brochures, specification manuals, photographs, finish samples and all other materials required to establish equality to the District for consideration and approval as an equal. If such approval is made, the manufacturer must submit a bid within the bid period to qualify. Inclusion on the bid form does not necessarily constitute an offer to buy. Related additional items, options or alternates may be added by so indicating in the blank spaces on the bid form or on attached sheet(s).

District reserves the right to award bid for any one or combination of items based on cost, life cycle analysis, quality, serviceability, cost of supplies, availability, compatibility with existing materials or equipment, ease of use and service, suitability for intended use and value as deemed in the best interest of the District.

Additional award criteria may include cost per unit or group of units, discounts, performance, test results, expansion capabilities, cost of potential service, trade in value, warranty terms and aesthetic value.

It is mutually accepted that the quantities defined in this document reflect the approximate District requirements. Actual quantities ordered may be adjusted. Therefore, it is necessary to indicate a unit price for each item bid on the bid form even if bidding group prices. Bids on groups are alternate bids and will be considered only if discount value warrants. "ALL OR NOTHING" BIDS WILL BE CONSIDERED NON-RESPONSIVE.

Prices quoted shall include set-up and installation in place as directed by the District. Supplier shall dispose of all trash and packing materials off campus and repair, at its own expense, damage caused to new or existing materials, structures, equipment or fixtures in the execution of this contract. **Do NOT include any pricing in Step One of the Two-Step Sealed Formal Bid.**

Prices shall be guaranteed for ninety (90) days. The offer shall be automatically extended to the District under terms and conditions herein, until canceled by the supplier. The District may order additional amounts of any item at any time during life of contract after initial order at the unit prices quoted herein which shall be delivered FOB Destination within 18 weeks A.R.O. **Do NOT include any pricing in Step One of the Two-Step Sealed Formal Bid.**

Time is of the essence for this contract.

To coordinate and organize delivery and installation schedule, it is understood and agreed by the supplier(s) that delivery and complete installation of all materials and equipment is preferred by **April 1, 2014**. District shall provide a minimum of 7-calendar days notice prior to delivery requirements. It shall be the supplier's responsibility to safely hold all items until authorized to begin delivery. District may require proof to the satisfaction of the District that purchase orders have been placed in a timely manner and that the bidder intends to honor the contract. Failure to provide such proof may be considered prima facie evidence that the bidder has failed to perform or refused to enter into the agreement.

Supplier warrants all equipment against manufacturing defects for a period of not less than one (1) year covering parts and labor, unless otherwise indicated. This warranty includes all costs of repair during the warranty period.

including transportation costs. The supplier will pass along to the District all manufacturer warranties available. Date of acceptance shall be applied for the commencement of the warranty period(s).

Unless otherwise specified on the bid form, this offer is further extended to other public entities within Los Angeles, Orange, San Bernardino, Riverside, San Diego, San Luis Obispo, Santa Barbara, Imperial and Ventura counties until cancelled. Any order placed against this offer is the responsibility of the entity placing the order and shall in no way constitute an obligation against the District.

Supplier agrees to provide adequate training of District personnel to efficiently operate and maintain any units installed.

The number of executed copies of the Contract or Agreement is 4, if required.

All articles, supplies or equipment bid herein shall be new. No rebuilt, demo or used units are acceptable.

All labor shall be performed by employees of the supplier, working under the direct supervision thereof.

Contractor shall at all times enforce strict discipline and good order among its employees and shall not employ on work any unfit person or anyone not fully skilled and all conduct shall conform to the highest professional standard. Any person in the employ of the Contractor whom the District may deem incompetent or unfit shall be dismissed from work and shall not again be employed on this site except with written consent of the District.

It shall be the responsibility of the Contractor to ascertain from the District, and to comply with, the rules and regulations pertaining to safety, security and driving on District property, particularly when students are present.

Any complaint or dispute lodged by a bidder, or awarded vendor, will initially be addressed by the Buyer for the District. Often, an issue may be resolved simply by providing clarification of bid documents, terms, pricing, payment, scope and/or deliverables. If you have a complaint or dispute regarding a bid, proposal solicitation, or award first discuss it with the Buyer. The Buyer's contact information is located on the Purchasing Departments website, <http://www.avc.edu/administration/busserv/PurchasingContact.html>.

If your complaint or dispute cannot be resolved informally, then you must either drop the issue at hand or notify the Buyer of your intent to protest. Notification of intent to protest must be received within seven (7) days from the date you were notified that your proposal was not selected to move forward with step two of the two-step sealed formal bid. You will then be given five (5) business days to submit a full and complete written statement specifying the grounds of the protest and the facts in support thereof. Once statement is received, the protest will be elevated to the Director of Business Services. Authority to protest may be limited to participating bidders. After all factors have been analyzed, a final decision shall be issued in a timely fashion by the District. The decision shall be in writing and shall be emailed/mailed or otherwise furnished to the bidder, vendor or contractor in such a manner as to ensure receipt. The decision of the District on a protest is final as the District has the final authority to resolve complaints, protests and disputes arising from the solicitation, award or performance of a contract.

# **BID FORMS**

**Appendix A – Intent to Respond Form**

Please complete and fax this form to Angela Musial before **2:00 p.m. PST January 2, 2014.**

**To: Angela Musial**

Antelope Valley Cmty. College

From: \_\_\_\_\_

Company  
Name: \_\_\_\_\_

Date: \_\_\_\_\_

Telephone: (661) 722-6310

Telephone: \_\_\_\_\_

FAX No. (661) 722-6320

FAX No. \_\_\_\_\_

E-mail address: [amusial1@avc.edu](mailto:amusial1@avc.edu)

E-mail address: \_\_\_\_\_

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**Re: HEALTH & SCIENCE MICROSCOPES, AVC2013/2014 -2**

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Please indicate your intent to respond to the RFP by placing an "X" in one of the following boxes

We intend to respond to this RFP by 10:00 a.m. PST      January 6, 2014

We will not be responding to this RFP.

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Contact Person

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Signature of Contact Person

By signing this intent to respond, you and your company are bound by the confidentiality terms of the RFP.

**This form is to be submitted during step one of two-step formal bid if submitting a proposal**



**FAX: Appendix B – Questions on RFP**

Use copies of the following form to submit questions of the RFP. Submit only one question per page and indicate the section of the RFP that relates to the question, if applicable. Fax the question form(s) to Angela Musial by **2:00 p.m. PST January 2, 2014**. All significant questions will be answered and shared with all participants who have indicated their intent to respond to this RFP.

**To: Angela Musial**

Antelope Valley Cmty. College

From: \_\_\_\_\_

Company Name: \_\_\_\_\_  
\_\_\_\_\_

Date: \_\_\_\_\_

Telephone: (661) 722-6310

Telephone: \_\_\_\_\_

FAX No. (661) 722-6320

FAX No. \_\_\_\_\_

E-mail address: [amusial1@avc.edu](mailto:amusial1@avc.edu)

E-mail address: \_\_\_\_\_

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Re: **HEALTH & SCIENCE MICROSCOPES, AVC2013/2014 -2**

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This Question is regarding the following section of the RFP: \_\_\_\_\_

Question:

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Contact Person: \_\_\_\_\_

Telephone No: \_\_\_\_\_ Fax No: \_\_\_\_\_

This form is to be submitted during step one of two-step formal bid as necessary

**Antelope Valley Community College District**  
3041 West Avenue K  
Lancaster, CA 93536-5426

DATE: December 14, 2013  
SUBJECT: BID NO. AVC2013/2014 -2

**FOR: Health & Science Microscopes**

Bid Opening Date: **TBD**                      Time: **TBD**

Please bid your **lowest prices** for the items and services on the attached sheets. Before bidding please read the **Instructions and Conditions** and **Specifications**, which are attached.

Submit all bids in a sealed envelope showing the Bid Number, opening date, and opening time. Bid **must** reach the Purchasing Office at the address listed above one hour prior to the time and date shown above.

If further information is desired call the Purchasing Department at (661) 722-6310.

The undersigned hereby proposes and agrees to furnish and deliver the goods or services as quoted in accordance with the terms, conditions, specifications, and prices herein quoted.

Bid is subject to cash discount of \_\_\_\_\_% \_\_\_\_\_ days.

FIRM NAME: \_\_\_\_\_

SIGNED BY: \_\_\_\_\_

(Manual signature- unsigned bids will be rejected)

TITLE: \_\_\_\_\_ DATE: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

PHONE NO: \_\_\_\_\_ FAX NO: \_\_\_\_\_

**NOTE: BIDS SUBMITTED BY FAX ARE NOT ACCEPTABLE.**

**This form is to be submitted during step two of two-step formal bid.**

BID PROPOSAL

**Health & Science Microscopes  
Bid Number AVC2013/2014 -2**

TO: **Antelope Valley College**, a California Community College, acting by and through its Board of Trustees (“the Owner”), 3041 West Avenue K, Lancaster, California 93536-5426.

FROM:

\_\_\_\_\_

(Name of Bidder)

\_\_\_\_\_

(Address)

\_\_\_\_\_

(City, State, Zip Code)

\_\_\_\_\_

(Telephone and FAX Number)

\_\_\_\_\_

(Name(s) of Bidder’s Authorized Representative(s))

\_\_\_\_\_

**1. Bid Proposal**

1.1 **Acknowledgement of Bid addenda.** In submitting this Bid Proposal, the undersigned Bidder acknowledges receipt of all Bid Addenda issued by or on behalf of the Owner, as set forth below. The Bidder confirms that this Bid Proposal incorporates and is inclusive of, all items or other matters contained in Bid Addenda.

\_\_\_\_\_ **No Addenda Issued**  
(initial)

\_\_\_\_\_ **Addenda Nos.** \_\_\_\_\_ received, acknowledged and  
(initial) incorporated into this Bid Proposal.

1.2 **Rejection of Bid; Holding Open of Bid Proposal.** It is understood that the Owner reserves the right to reject this Bid Proposal and that this Bid Proposal shall remain open and not be withdrawn for the period of time specified in the Call for Bids.

1.3 **Documents Accompanying Bid Proposal.** The undersigned Bidder has submitted with this Bid Proposal the following:

- Company Identification Form
- Itemized list and explanation of all Required License and Access/  
Activation fees on a separate sheet

1.4 **Award of Contract.** It is understood and agreed that if written notice of the acceptance of this Bid Proposal and award of the Contract thereon is mailed or delivered by the Owner to the undersigned after the opening of Bid Proposals and within the time this Bid Proposal is required to

**This form is to be submitted during step one of two-step formal bid.**

remain open or at any time thereafter before this Bid Proposal is withdrawn, the undersigned will execute and deliver to the Owner the Agreement in the form attached hereto in accordance with the Bid Proposal as accepted within five (5) working days after notification of acceptance and award. Failure of the Bidder awarded the Contract to strictly comply with the proceeding may result in the Owner's recession of the award of the Contracts. In such event, the Owner may, in its sole and exclusive discretion elect to award the Contract to the responsible Bidder submitting the next lowest Bid Proposal, or to reject all Bid Proposals. The Work under the Contract Documents shall be commenced by the undersigned Bidder, if awarded the Contract, on the date stated in the Owner's Notice to Proceed issued pursuant to the Contract Documents and Completion of the Work shall be achieved within the Contract Time specified in the Contract Documents.

1.5 **Notices.** All notices or other correspondence shall be addressed to the Owner and the Bidder at their respective addresses set forth herein. Notices shall be effective only if in writing and in conformity with the requirements for service of notices set forth in the Contract Documents.

1.6 **Acknowledgement and Confirmation.** The undersigned Bidder acknowledges its receipt, review and understanding of the Specifications and other Contract Documents pertaining to the proposed Work. The undersigned Bidder certifies that the Contract Documents are, in its opinion, adequate, feasible and complete for providing and performing the Work in a sound and suitable manner for the use specified and intended by the Contract Documents. The undersigned Bidder certifies that it has, or has available, all necessary equipment, personnel, materials, facilities and technical and financial ability to complete the Work for the amount bid herein with the Contract Time and in accordance with the Contract Documents.

By: \_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Typed or Printed Name)

\_\_\_\_\_  
(Title)

(Corporate Seal)

This form is to be submitted during step one of two-step formal bid.

**BID PROPOSAL**

**Health & Science Microscopes  
Bid Number AVC2013/2014 -2**

TO: **Antelope Valley College**, a California Community College, acting by and through its Board of Trustees (“the Owner”), 3041 West Avenue K, Lancaster, California 93536-5426.

FROM:

\_\_\_\_\_

(Name of Bidder)

\_\_\_\_\_

(Address)

\_\_\_\_\_

(City, State, Zip Code)

\_\_\_\_\_

(Telephone and FAX Number)

\_\_\_\_\_

(Name(s) of Bidder’s Authorized Representative(s))

\_\_\_\_\_

**1. Bid Proposal continued**

**1.1 Bid Proposal Amount.** Pursuant to and in compliance with the Call for Bids, the Instructions for Bidders and the other documents relating thereto, the undersigned Bidder having reviewed the Instructions for Bidders and all other Contract Documents and upon compliance with all requirements therein with reference to the submittal of this Bid Proposal, hereby proposes and agrees to perform the Contract including, without limitation, all of its component parts; to perform everything required to be performed; to provide and furnish any and all of the labor, materials and services necessary to perform the Contract and complete in a workmanlike manner all of the Work required for the Project described as:

Health & Science Microscopes, Bid Number AVC2013/2014 -2

all in strict conformity with the Specifications and other Contract Documents on file at the office of the Owner’s Purchasing Department for the sum of:

**Total Bid (including Sales Tax and Delivery Charges): Health & Science Microscopes**

\_\_\_\_\_ Dollars

(\$ \_\_\_\_\_)

The undersigned Bidder agrees to achieve Completion of the Work within the Contract Time set forth in the Contract Documents.

This form is to be submitted during step two of two-step formal bid.

1.2 **Confirmation of Figures.** By submitting this Bid Proposal, the Bidder confirms that it has checked all of the above figures and understands that neither the Owner nor any of its agents, employees or representatives shall be responsible for any errors or omissions on the part of the undersigned Bidder in preparing and submitting this Bid Proposal.

By: \_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Typed or Printed Name)

\_\_\_\_\_  
(Title)

(Corporate Seal)

This form is to be submitted during step two of two-step formal bid.

# **CONTRACT FORMS**

# AGREEMENT

THIS AGREEMENT, made the \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_ in the County of Los Angeles, State of California, by and between **ANTELOPE VALLEY COLLEGE**, hereinafter called the **DISTRICT** and

hereinafter called the **CONTRACTOR**, WITNESSETH that the District and the Contractor for the consideration stated herein agree as follows:

## ARTICLE 1 – SCOPE OF WORK

The CONTRACTOR shall provide, within the time stipulated, the Contract as herein defined and shall provide all labor, materials, and distribution to complete in a workmanlike manner all of the work required in connection with the following titled project:

**BID # AVC2013/2014 - 2**

**HEALTH & SCIENCE MICROSCOPES**

## ARTICLE 2 – TIME FOR COMPLETION

The work shall be commenced on the date stated in the DISTRICT'S notice to proceed as specified therein, and shall be completed not later than \_\_\_\_\_.

## ARTICLE 3 – CONTRACT PRICE

The DISTRICT shall pay the CONTRACTOR as full compensation for the faithful performance of the contract, subject to any additions or deductions as provided in the contract documents, the sum of \_\_\_\_\_ dollars (\$ \_\_\_\_\_) said sum being the total amount of the amounts stipulated in the bid.

## ARTICLE 4-COMPONENT PARTS OF THE CONTRACT

The contract entered into by this Agreement consists of the following contract documents, all of which are component parts of the contract as if herein set out in full attached hereto:

- General Conditions and special Conditions (if any)
- Information for Bidders
- Invitation to Bid
- Plans and Specifications
- Addenda (if any)

All of the above-named contract documents are intended to be complementary. Work required by one of the above-named contract documents and not by others shall be done as if required by all.

In WITNESS WHEREOF, the Agreement has been duly executed by the above-named parties, on the day and year first above written.



**CONTRACTOR**

**DISTRICT**

\_\_\_\_\_

License No.: \_\_\_\_\_

Expiration Date: \_\_\_\_\_

By: \_\_\_\_\_  
Printed Name

By: \_\_\_\_\_  
Signature

“The undersigned declares under penalty of perjury Title \_\_\_\_\_

Under the laws of the State of California that the  
Representations made on this bid are true and correct”

By: \_\_\_\_\_  
Printed Name

By: \_\_\_\_\_  
Signature

Title: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

Phone: \_\_\_\_\_

Fax: \_\_\_\_\_

NOTE: If bidder is a corporation, the legal name of the corporations(s) shall be set forth above together with the signatures of authorized officers or agents and the document shall bear the corporate seal; if bidder is a partnership, the true name shall be set forth above together with the signature of the partner or partners authorized to sign the contract on behalf of the partnership; and if the bidder is an individual, his/her signature shall be placed above.

# **RUBRICS FOR EVALUATION**

## Rubric for Best Value Evaluation

Biology Stereomicroscope for General Biology, General Molecular Cell Biology, General Organismal, Ecological, and Evolutionary Biology\*

### Item 1.1, Quantity: 24

Criterion	Performance Indicator	Rating Scale
Stability on Bench	Strong rigid stand with stable base	0-30
Quality of Moving Parts	Material Quality, Feel and Performance, Durability	0-50
Zoom ratio	Minimum: 6.7:1	0-50
Binocular	Tube inclination 45°	0-30
Optical Components	Greenough, lead free	0-30
Focusable Eyepieces	Wide field, 10x, 22 mm: eyepiece guards, sharpened pointers	0-50
Quality of Magnification	Image Sharpness/Resolution	0-50
Illumination:LED transmitted and reflected	White balance, uniformity, lack of artifacts	0-50
Convenience Features	Carrying handle, power cord stowing, bulb replacement, dust cover, etc.	0-50
Zoom capability	Degree of focus and position retention when changing magnification	0-50
References	Past performance (3 minimum reference checks)	0-50
Warranty	Standard 5 year mechanical and optical, 1 year electrical	0-50
<b>Best Value Rating</b>	<b>Sum of all ratings: Maximum possible</b>	<b>540</b>

#### Rating Scales:

<p><b>0-50</b> 0 = Lowest rating, 50 = Highest rating increments of 10</p> <p>50 = Fully exceeds the Performance Indicator 40 = Somewhat exceeds the Performance Indicator 30 = Meets the Performance Indicator 20 = Meets most of the Performance Indicator 10 = Meets part of the Performance Indicator 0 = Does not meet any of the Performance Indicator</p>	<p><b>0-30</b> 0 = Lowest rating, 30 = Highest rating increments of 30</p> <p>30 = Meets the Performance Indicator 0 = Does not meet the Performance Indicator</p>
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\*See Course Outline of Record (COR) in attached section

## Rubric for Best Value Evaluation

### Microbiology Microscopes for General Microbiology\*

#### Item 1.2 Quantity: 25

Criterion	Performance Indicator	Rating Scale
Stability on Bench	Tipping Threshold Angle	0-30
Quality of Moving Parts including revolving nosepiece	Material Quality, Feel and Performance, Durability	0-50
Binocular	Tube inclination 30°, field number 20 mm	0-30
Eyepieces	Wide field 10X, lead free, eyepiece guards, sharpened pointer and micrometer reticule 10mm/100 units	0-50
Objectives	Infinity corrected Plan Achromats 4x, 10x, 40x and 100x, lead free, flat field	0-50
Condenser	Fixed Abbe' NA 1.25 with oil immersion, blue filter	0-50
Student Proof	Eyepieces, objectives and condenser	0-50
Illumination	Koehler, transmitted light, variable control	0-30
Quality of 40-400x Images	Sharpness/Resolution	0-50
Quality of 1000x Images	Oil immersion Sharpness/Resolution	0-50
Mechanical Stage	Stable: focus drift or vibrations	0-30
Illumination: image	White balance, uniformity, lack of artifacts, ability to distinguish gram + from gram - bacteria	0-50
Parfocality and Parcentricity	Degree of focus and position retention when changing objectives	0-50
Frame	Compact and stable	0-50
Convenience Features	Carrying handle, power cord stowing, bulb replacement, dust cover, etc.	0-50
References	Past performance (3 minimum reference checks)	0-50
Warranty	Standard 5 year mechanical and optical, 1 year electrical	0-50
<b>Best Value Rating</b>	<b>Sum of all ratings: Maximum possible</b>	<b>770</b>

#### Rating Scales:

<p><b>0-50</b> 0 = Lowest rating, 50 = Highest rating increments of 10</p> <p>50 = Fully exceeds the Performance Indicator 40 = Somewhat exceeds the Performance Indicator 30 = Meets the Performance Indicator 20 = Meets most of the Performance Indicator 10 = Meets part of the Performance Indicator 0 = Does not meet any of the Performance Indicator</p>	<p><b>0-30</b> 0 = Lowest rating, 30 = Highest rating increments of 30</p> <p>30 = Meets the Performance Indicator 0 = Does not meet the Performance Indicator</p>
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\*See Course Outline of Record (COR) in attached section

## Rubric for Best Value Evaluation

Compound Microscopes for General & Majors Biology, Human Biology, Elementary Human Anatomy & Physiology, General Human Anatomy, General Human Physiology and Physical Anthropology Laboratories\*

### Item 1.3 Quantity: 87

Criterion	Performance Indicator	Rating Scale
Stability on Bench	Tipping Threshold Angle	0-30
Quality of Moving Parts including revolving nosepiece	Material Quality, Feel and Performance, Durability	0-50
Binocular	Tube inclination 30°, field number 20 mm	0-30
Eyepieces	Wide field 10X, lead free, eyepiece guards, sharpened pointer and micrometer reticule 10mm/100 units	0-50
Objectives	Infinity corrected Plan Achromats 4x, 10x, and 40x, lead free, flat field	0-50
Condenser	Fixed Abbe' NA 1.25, blue filter	0-50
Student Proof	Eyepieces, objectives and condenser	0-50
Illumination	Koehler, transmitted light, variable control	0-30
Quality of 40-400x Images	Sharpness/Resolution	0-50
Mechanical Stage	Stable: focus drift or vibrations	0-30
Illumination: image	White balance, uniformity, lack of artifacts, ability to distinguish gram + from gram - bacteria without oil immersion	0-50
Parfocality and Parcentricity	Degree of focus and position retention when changing objectives	0-50
Frame	Compact and stable	0-50
Convenience Features	Carrying handle, power cord stowing, bulb replacement, dust cover, etc.	0-50
References	Past performance (3 minimum reference checks)	0-50
Warranty	Standard 5 year mechanical and optical, 1 year electrical	0-50
<b>Best Value Rating</b>	<b>Sum of all ratings: Maximum possible</b>	<b>720</b>

#### Rating Scales:

<p><b>0-50</b> 0 = Lowest rating, 50 = Highest rating increments of 10</p> <p>50 = Fully exceeds the Performance Indicator 40 = Somewhat exceeds the Performance Indicator 30 = Meets the Performance Indicator 20 = Meets most of the Performance Indicator 10 = Meets part of the Performance Indicator 0 = Does not meet any of the Performance Indicator</p>	<p><b>0-30</b> 0 = Lowest rating, 30 = Highest rating increments of 30</p> <p>30 = Meets the Performance Indicator 0 = Does not meet the Performance Indicator</p>
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\*See Course Outline of Record (COR) in attached section

## Rubric for Best Value Evaluation

Instructors Compound Microscopes and 5 Megapixel Digital Cameras for  
General Human Anatomy and Microbiology\*

### Item 1.4 Quantity: 2

Criterion	Performance Indicator	Rating Scale
Stability on Bench	Tipping Threshold Angle	0-30
Quality of Moving Parts including revolving nosepiece	Material Quality, Feel and Performance, Durability	0-50
Trinocular	Tube inclination 30°, field number 20 mm, C-mount	0-30
Eyepieces	Wide field 10X, lead free, eyepiece guards, sharpened pointer and micrometer reticule 10mm/100 units	0-50
Objectives	Infinity corrected Plan Achromats 4x, 10x, 40x and 100x, lead free, flat field	0-50
Condenser	Fixed Abbe' NA 1.25 with oil immersion, blue filter	0-50
Student Proof	Eyepieces, objectives and condenser	0-50
Illumination	Koehler, transmitted light, variable control	0-30
Quality of 40-400x Images	Sharpness/Resolution	0-50
Quality of 1000x Images	Oil immersion Sharpness/Resolution	0-50
Mechanical Stage	Stable: focus drift or vibrations	0-30
Illumination: image	White balance, uniformity, lack of artifacts, ability to distinguish gram + from gram - bacteria	0-50
Parfocality & Parcentricity	Degree of focus and position retention when changing objectives	0-50
Frame	Compact and stable	0-50
Convenience Features	Carrying handle, power cord stowing, bulb replacement, dust cover, etc.	0-50
5 Megapixel Digital Camera	Intuitive, easy to use, quality images, Mac compatible, software	0-50
References	Past performance (3 minimum reference checks)	0-50
Warranty	Standard 5 year mechanical and optical, 1 year electrical	0-50
	Digital camera: 1 year manufactures	0-50
<b>Best Value Rating</b>	<b>Sum of all ratings: Maximum possible</b>	<b>870</b>

#### Rating Scales:

<p><b>0-50</b> 0 = Lowest rating, 50 = Highest rating increments of 10</p> <p>50 = Fully exceeds the Performance Indicator 40 = Somewhat exceeds the Performance Indicator 30 = Meets the Performance Indicator 20 = Meets most of the Performance Indicator 10 = Meets part of the Performance Indicator 0 = Does not meet any of the Performance Indicator</p>	<p><b>0-30</b> 0 = Lowest rating, 30 = Highest rating increments of 30</p> <p>30 = Meets the Performance Indicator 0 = Does not meet the Performance Indicator</p>
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\*See Course Outline of Record (COR) in attached section

## Rubric for Best Value Evaluation

Instructors Compound Microscopes and 2 Megapixel Digital Cameras for  
General & Majors Biology, Human Biology, Elementary Human Anatomy &  
Physiology and General Human Physiology Laboratories\*

### Item 1.5 Quantity: 4

Criterion	Performance Indicator	Rating Scale
Stability on Bench	Tipping Threshold Angle	0-30
Quality of Moving Parts including revolving nosepiece	Material Quality, Feel and Performance, Durability	0-50
Trinocular	Tube inclination 30°, field number 20 mm, C-mount	0-30
Eyepieces	Wide field 10X, lead free, eyepiece guards, sharpened pointer and micrometer reticule 10mm/100 units	0-50
Objectives	Infinity corrected Plan Achromats 4x, 10x, 40x and 100x, lead free, flat field	0-50
Condenser	Fixed Abbe' NA 1.25 with oil immersion, blue filter	0-50
Student Proof	Eyepieces, objectives and condenser	0-50
Illumination	Koehler, transmitted light, variable control	0-30
Quality of 40-400x Images	Sharpness/Resolution	0-50
Quality of 1000x Images	Oil immersion Sharpness/Resolution	0-50
Mechanical Stage	Stable: focus drift or vibrations	0-30
Illumination: image	White balance, uniformity, lack of artifacts, ability to distinguish gram + from gram - bacteria	0-50
Parfocality and Parcentricity	Degree of focus and position retention when changing objectives	0-50
Frame	Compact and stable	0-50
Convenience Features	Carrying handle, power cord stowing, bulb replacement, dust cover, etc.	0-50
2 Megapixel Digital Camera	Intuitive, easy to use, quality images, Mac compatible, software	0-50
References	Past performance (3 minimum reference checks)	0-50
Warranty	Standard 5 year mechanical and optical, 1 year electrical	0-50
	Digital camera: 1 year manufactures	0-50
<b>Best Value Rating</b>	<b>Sum of all ratings: Maximum possible</b>	<b>870</b>

#### Rating Scales:

<p><b>0-50</b> 0 = Lowest rating, 50 = Highest rating increments of 10</p> <p>50 = Fully exceeds the Performance Indicator 40 = Somewhat exceeds the Performance Indicator 30 = Meets the Performance Indicator 20 = Meets most of the Performance Indicator 10 = Meets part of the Performance Indicator 0 = Does not meet any of the Performance Indicator</p>	<p><b>0-30</b> 0 = Lowest rating, 30 = Highest rating increments of 30</p> <p>30 = Meets the Performance Indicator 0 = Does not meet the Performance Indicator</p>
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\*See Course Outline of Record (COR) in attached section

## Rubric for Best Value Evaluation

### Instructors Polarizing Trinocular Microscopes & 2 Megapixel Digital Cameras for Geology, Materials Science & Strength of Materials Laboratories\*

#### Item 1.6 Quantity: 2

Criterion	Performance Indicator	Rating Scale
Stability on Bench	Tipping Threshold Angle	0-30
Quality of Moving Parts including revolving nosepiece	Material Quality, Feel and Performance, Durability	0-50
Trinocular	Tube inclination 30°, field number 20 mm, light split ratio 50/50, C-mount	0-30
Eyepieces	Wide field 10X, lead free, eyepiece guards, sharpened pointer and micrometer reticule 10mm/100 units	0-50
Objectives	Achromats for polarized light 10x, 20x, 40x and 100x, lead free, flat field	0-50
Intermediate tube	Conoscopic, Bertrand lens, detachable, focusable, Analyzer	0-50
Stage	Polarizing, rotatable 360°, centering function	0-50
Condenser	Condensor for polarized light, NA 1.25 with oil immersion, blue filter	0-50
Illumination	Koehler, transmitted light, variable control	0-30
Quality of 40-400x Images	Sharpness/Resolution	0-50
Quality of 1000x Images	Oil immersion Sharpness/Resolution	0-50
Illumination: image	White balance, uniformity, lack of artifacts, ability to distinguish gram + from gram - bacteria	0-50
Parfocality & Parcentricity	Degree of focus and position retention when changing objectives	0-50
Frame	Compact and stable	0-50
Convenience Features	Carrying handle, power cord stowing, bulb replacement, dust cover, etc.	0-50
2 Megapixel Digital Camera	Intuitive, easy to use, quality images, Mac compatible, software	0-50
References	Past performance (3 minimum reference checks)	0-50
Warranty	Standard 5 year mechanical and optical, 1 year electrical	0-50
	Digital camera: 1 year manufactures	0-50
<b>Best Value Rating</b>	<b>Sum of all ratings: Maximum possible</b>	<b>890</b>

#### Rating Scales:

<p><b>0-50</b> 0 = Lowest rating, 50 = Highest rating increments of 10</p> <p>50 = Fully exceeds the Performance Indicator 40 = Somewhat exceeds the Performance Indicator 30 = Meets the Performance Indicator 20 = Meets most of the Performance Indicator 10 = Meets part of the Performance Indicator 0 = Does not meet any of the Performance Indicator</p>	<p><b>0-30</b> 0 = Lowest rating, 30 = Highest rating increments of 30</p> <p>30 = Meets the Performance Indicator 0 = Does not meet the Performance Indicator</p>
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\*See Course Outline of Record (COR) in attached section



**Rubric for Best Value Evaluation**  
**Cool Light Illuminator**  
**Item 1.7 Quantity 6 units**

<b>Criterion</b>	<b>Performance Indicator</b>	<b>Ranking Scale</b>
Quality of Moving Parts	Material Quality, Feel and Performance, Durability	0-50
Illumination	White balance, uniformity of field	0-50
Convenience Features	Carrying handle, power cord stowing, bulb replacement, etc.	0-50
Warranty	Standard warranty	0-50
<b>Best Value Rating</b>	<b>Sum of all ratings: Maximum possible</b>	<b>200</b>

**Rating Scale:**

<p><b>0-50</b>  0 = Lowest rating, 50 = Highest rating  increments of 10</p> <p>50 = Fully exceeds the Performance Indicator  40 = Somewhat exceeds the Performance Indicator  30 = Meets the Performance Indicator  20 = Meets most of the Performance Indicator  10 = Meets part of the Performance Indicator  0 = Does not meet any of the Performance Indicator</p>
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## Rubric for Best Value Evaluation

Anthropology Stereomicroscope for Physical Anthropology Laboratory\*

**Item 1.8, Quantity: 12**

Criterion	Performance Indicator	Rating Scale
Stability on Bench	Strong rigid stand with stable base	0-30
Quality of Moving Parts	Material Quality, Feel and Performance, Durability	0-50
Zoom ratio	Minimum: 5.0:1	0-50
Binocular	Tube inclination 45°	0-30
Optical Components	Greenough, lead free	0-30
Focusable Eyepieces	Wide field, 10x, 22 mm: eyepiece guards, sharpened pointers	0-50
Quality of Magnification	Image Sharpness/Resolution	0-50
Illumination:LED transmitted and reflected	White balance, uniformity, lack of artifacts	0-50
Convenience Features	Carrying handle, power cord stowing, bulb replacement, dust cover, etc.	0-50
Zoom capability	Degree of focus and position retention when changing magnification	0-50
References	Past performance (3 minimum reference checks)	0-50
Warranty	Standard 5 year mechanical and optical, 1year electrical	0-50
<b>Best Value Rating</b>	<b>Sum of all ratings: Maximum possible</b>	<b>540</b>

### Rating Scales:

<p><b>0-50</b></p> <p>0 = Lowest rating, 50 = Highest rating increments of 10</p> <p>50 = Fully exceeds the Performance Indicator 40 = Somewhat exceeds the Performance Indicator 30 = Meets the Performance Indicator 20 = Meets most of the Performance Indicator 10 = Meets part of the Performance Indicator 0 = Does not meet any of the Performance Indicator</p>	<p><b>0-30</b></p> <p>0 = Lowest rating, 30 = Highest rating increments of 30</p> <p>30 = Meets the Performance Indicator 0 = Does not meet the Performance Indicator</p>
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\*See Course Outline of Record (COR) in attached section

# **COURSE OUTLINE OF RECORDS (COR'S)**



ANTELOPE VALLEY COLLEGE

## Academic Affairs Course Outline of Record

Approval Dates  
COR: 09/13/2012  
SLO: 04/10/2008

- **COURSE SUBJECT & NUMBER:** GEOL 101L
- **COURSE NAME:** \*Physical Geology Lab
- **COURSE UNITS:** 1
- COURSE HOURS:** Lab: 3.00 hours weekly (54 Hours Total)
- **COURSE REQUISITES: (Follow format of similar courses found in the college catalog.)**

Corequisite: Concurrent enrollment in GEOL 101 or completion of ,

Advisory: Eligibility for College Level Reading , Eligibility for ENGL 101 and Eligibility for MATH 102

- **COURSE DESCRIPTION: (Write a short paragraph providing an overview of topics covered. Be sure to identify target audience—transfer, major, GE, degree/certificate, etc. If repeatable, state the number of times at end of description as (R# ).**

Physical Geology Laboratory provides students with hands-on introduction to the analysis and identification of common minerals and rocks, the analysis and interpretation of topographic and geologic maps, and recognition of characteristic landforms associated with surface processes and tectonic activity. The students will learn basic analytical and geologic skills that will enable them to interpret geologic histories based on fundamental geologic principles and processes. (CSU, UC, AVC)

- **COURSE OBJECTIVES: ( Title 5 requires that courses show evidence of critical thinking skills. Use Bloom's taxonomy to formulate concise, performance-based measurable objectives common to all students. Objectives must be closely aligned with course content, assignments, and methods of evaluation)**

**Upon completion of course, the successful student will be able to**

1. Apply the principles of the scientific method in the evaluation and assessment of Earth materials and processes.
2. Demonstrate an understanding of Earth processes by categorizing and identifying common rock-forming minerals through their appearance, and physical properties.
3. Demonstrate an understanding of Earth processes by categorizing and identifying common igneous, sedimentary, and metamorphic rocks through their appearance, textures, and mineral assemblages.
4. Recognize, analyze, and interpret major geologic features associated with surface and tectonic processes.
5. Examine and evaluate geologic maps and cross sections to construct a geologic history.
6. Interpret and appraise relative ages of geologic strata by applying and comparing fundamental geologic principles.
7. Calculate the age of geologic materials using established radiometric age dating techniques.
8. Analyze and interpret information presented on topographic maps, and locate areas or map features using standard map grid systems.
9. Demonstrate an ability to communicate complex course concepts effectively through writing and diagrams.
10. Apply the principles of the scientific method in the evaluation and assessment of Earth's history and the development of life.

- **COURSE CONTENT:**

### I. Mineral and rock identification:

- A. Physical properties to identify minerals.
- B. Physical characteristics of igneous, sedimentary, and metamorphic rocks.
- C. Classification of igneous and metamorphic rocks via mineral assemblages and textures.
- D. Classification of sedimentary rocks by grain size distribution and sedimentary features.

### II. Topographic maps:

- A. Relief and surface features on topographic maps.
- B. Elevation contours, slope angles, and profiles.

C. Latitude and longitude, and township and range grid systems.

III. **Geologic maps and geologic data:**

A. Geologic maps and cross sections.

B. Geologic histories based on geologic time and geologic principles.

C. Relative age relationships and geologic histories based on fossil assemblages.

IV. **Surface processes**

A. Fluvial systems and characteristic landforms

B. Groundwater occurrence and associated landforms

C. Desert processes and associated landforms

D. Glacial processes and associated erosional and depositional landforms

E. Coastal processes, wave development, and associated landforms

V. **Geologic time and age dating**

A. Relative time

B. Absolute/radiometric time

C. Development of the Geologic Time Scale

VI. **Plate Tectonics**

A. Plate boundaries and associated geological structures

B. Distribution and types of volcanism associated with plate tectonics

C. Distribution and types of earthquakes associated with plate tectonics

o **TYPICAL HOMEWORK ASSIGNMENTS: (Do not include in-class work, quizzes, or tests)**

This information is necessary for all credit courses. Assignments should be closely related to course objectives, content, and methods of evaluation. (See sample of a "Model Outline" in the AP&P Standards & Practices Handbook.) Include a range of assignments (minimum of three) from which faculty may choose when designing their syllabus.

1. Describe nature and frequency of typical reading assignments if applicable; note if any are required:

Students will be assigned weekly reading assignments from Historical Geology laboratory manual in prepare for upcoming lab activities.

2. Describe nature and frequency of typical writing assignments if applicable; note if any are required:

N/A

3. Describe nature and frequency of typical computational assignments if applicable; note if any are required:

N/A

4. Describe other types of homework assignments that students may be asked to complete (oral presentations; special projects; visual/performing arts; etc); note if any are required:

N/A

For categories 1-4 above, list the estimated hours per week it would take a student to complete assignments. Title 5 (section 55002) requires that each unit must be shown to require three hours of work per week by the student either in or out of class. Homework formula: 3 hours of class work times each unit of credit minus classroom hours equals required homework hours.

Reading Assignments:  $\frac{1}{0}$

Writing Assignments:  $\frac{0}{0}$

Computational Assignments:  $\frac{0}{0}$

Other Assignments:  $\frac{0}{0}$

o **METHODS OF INSTRUCTION: (Methods must be consistent with content and appropriate to objectives; state in terms of what instructor will be doing in order to present course content to students: for example, lecture, demonstration, present audio/visual materials; facilitate group work, etc. Do not list specific instructional equipment.)**

o Individualized Instruction

o Instructor led Discussion

o Instructor led Problem Solving

o Lab

o Observation and Demonstration

o Other: Students will be continually monitored and questioned to determine their comprehension as they are guided through the hands-on lab activities.

o **METHODS OF EVALUATION: (These must be clearly related to course objectives and reflect course content and assignments in order to comply with Title 5 requirements. Describe what instructor will be looking for when evaluating**

various assignments and tests in order to determine whether students have met course objectives. Grades must be based on demonstrated proficiency in subject matter and determined, where appropriate, by essays, objective and essay tests, research papers or projects, problem solving exercises, or skills' demonstrations.)

1. Observation of student comprehension and understanding during in-class lab assignments in conjunction with student performance on tests will be used to evaluate student proficiency. (Objectives: 1, 2, 3, 4, 5, 6, 7, 8, 9)

◦ **SUGGESTED TEXTS OR OTHER INSTRUCTIONAL MATERIALS**

(List several when possible; include title, author, publisher, date, and latest edition. If older than five years, provide brief rationale.)

- Allan Ludman and Stephen Marshak (2011). *Laboratory Manual for Introductory Geology* (2nd /e). W.W. Norton.
- Robert Rutherford and James Carter (2011). *Zumberge's Laboratory Manual for Physical Geology* (15th /e). McGraw Hill.
- Richard Busch, Ed. (2012). *Laboratory Manual in Physical Geology, American Geological Institute, National Association of Geoscience Teachers* (8th /e). Prentice Hall.
- The above are standard geology laboratory manuals and others may be substituted at the discretion of the instructor.



ANTELOPE VALLEY COLLEGE

Academic Affairs  
Course Outline of Record

Approval Dates  
COR: 10/25/2012  
SLO: 05/27/2008

- **COURSE SUBJECT & NUMBER:** ENGR 220L
- **COURSE NAME:** \*Strength of Materials Lab
- **COURSE UNITS:** 1
- **COURSE HOURS:** Lab: 3.00 hours total (3 Hours Total)
- **COURSE REQUISITES:** (Follow format of similar courses found in the college catalog.)  
Corequisite: Concurrent enrollment in ENGR 220 Concurrent enrollment
- **COURSE DESCRIPTION:** (Write a short paragraph providing an overview of topics covered. Be sure to identify target audience—transfer, major, GE, degree/certificate, etc. If repeatable, state the number of times at end of description as (R# ).  
A laboratory course designed to accompany ENGR 220 lecture. (CSU, AVC)
- **COURSE OBJECTIVES:** ( Title 5 requires that courses show evidence of critical thinking skills. Use Bloom's taxonomy to formulate concise, performance-based measurable objectives common to all students. Objectives must be closely aligned with course content, assignments, and methods of evaluation)

Upon completion of course, the successful student will be able to

1. Conduct and interpret data of the following material tests: a. Tensile and hardness of steel and aluminum. b. Torsion of steel. c. Strain gauge of metals. d. Wood shear e. Column f. Flexure test - bending stresses g. Experimental stress analysis (pressure vessels)
2. Write short technical reports as a follow up to the above tests.
3. Read and apply stress analysis literature to the analysis of the structural tests.
4. Listen to technical lectures and apply these lectures to the analysis of the structural tests.
5. Increase the ability to understand technical literature and apply these concepts to actual structural tests.

- **COURSE CONTENT:**

- I. Tensile Test
- II. Torsion Tests
- III. Strain Gauges
- IV. Wood Shear
- V. Column Cement
- VI. Fatigue Experiment
- VII. Column Buckling
- VIII. Flexure Test
- IX. Experimental Pressure
- X. Report Writing Techniques

- **TYPICAL HOMEWORK ASSIGNMENTS:** (Do not include in-class work, quizzes, or tests)  
This information is necessary for all credit courses. Assignments should be closely related to course objectives, content, and methods of evaluation. (See sample of a "Model Outline" in the AP&P Standards & Practices Handbook.) Include a range of assignments (minimum of three) from which faculty may choose when designing their syllabus.

1. Describe nature and frequency of typical reading assignments if applicable; note if any are required:

Readings may include, but are not limited to Internet sites, periodicals, magazines, American Society of Testing Materials (ASTM) articles, instructor written materials, and textbooks.

2. Describe nature and frequency of typical writing assignments if applicable; note if any are required:

Writing assignments may include, but are not limited to, keeping a journal of lab tests and data, plus writing summary lab reports with conclusions.

3. Describe nature and frequency of typical **computational** assignments if applicable; note if any are required:

Routine math computations necessary to interpreting the raw data.

4. Describe other types of homework assignments that students may be asked to complete (oral presentations; special projects; visual/performing arts; etc); note if any are required:

N/A

For categories 1-4 above, list the estimated hours per week it would take a student to complete assignments. Title 5 (section 55002) requires that each unit must be shown to require three hours of work per week by the student either in or out of class. Homework formula: 3 hours of class work times each unit of credit minus classroom hours equals required homework hours.

Reading Assignments: 2

Writing Assignments: 1

Computational Assignments: 2

Other Assignments: 0

- **METHODS OF INSTRUCTION:** (Methods must be consistent with content and appropriate to objectives; state in terms of what instructor will be doing in order to present course content to students: for example, lecture, demonstration, present audio/visual materials; facilitate group work, etc. Do not list specific instructional equipment.)
  - Lab
  - Lecture
- **METHODS OF EVALUATION:** (These must be clearly related to course objectives and reflect course content and assignments in order to comply with Title 5 requirements. Describe what instructor will be looking for when evaluating various assignments and tests in order to determine whether students have met course objectives. Grades must be based on demonstrated proficiency in subject matter and determined, where appropriate, by essays, objective and essay tests, research papers or projects, problem solving exercises, or skills' demonstrations.)
  1. Written reports summarizing the lab tests will be evaluated based on the accuracy of the data interpretation, conclusions drawn from data interpretation, conciseness and quality of the written presentation. (Objectives: 1, 2, 3, 4, 5)
  2. Quizzes will be used to verify independent mastery of the learning objectives. (Objectives: 1, 2, 3, 4, 5)
- **SUGGESTED TEXTS OR OTHER INSTRUCTIONAL MATERIALS**  
(List several when possible; include title, author, publisher, date, and latest edition. If older than five years, provide brief rationale.)
  - Hibbeler (2008). *Mechanics of Materials* (7th/e). Prentice Hall.





ANTELOPE VALLEY COLLEGE

## Academic Affairs Course Outline of Record

Approval Dates  
COR: 05/13/2010  
SLO: 05/27/2008

- **COURSE SUBJECT & NUMBER:** ENGR 130L
- **COURSE NAME:** Materials Science Lab
- **COURSE UNITS:** 1  
**COURSE HOURS:** Lab: 3.00 hours weekly (54 Hours Total)
- **COURSE REQUISITES:** (Follow format of similar courses found in the college catalog.)  
Corequisite: Concurrent enrollment in ENGR 130
- **COURSE DESCRIPTION:** (Write a short paragraph providing an overview of topics covered. Be sure to identify target audience—transfer, major, GE, degree/certificate, etc. If repeatable, state the number of times at end of description as (R#).  
A laboratory course designed to accompany ENGR 130 Materials Science. (CSU, AVC)
- **COURSE OBJECTIVES:** ( Title 5 requires that courses show evidence of critical thinking skills. Use Bloom's taxonomy to formulate concise, performance-based measurable objectives common to all students. Objectives must be closely aligned with course content, assignments, and methods of evaluation)

Upon completion of course, the successful student will be able to

1. Conduct and interpret data of the following material tests: Steel and aluminum in tensile and rockwell hardness tests.
2. Conduct and interpret data of the following material tests: Steel, aluminum and wood using metallographic and Charpy impact tests
3. Predict the effects of cold working and recrystallization on steel and aluminum
4. Create a phase diagram for steel and other materials using heat treatments.
5. Conduct heat treatment of steel and influencing tensile properties effecting semiconductor property.
6. Conduct specialized testing and fabrication of plastic, ceramics and composite materials.
7. Write short technical reports.
8. \*Read and apply technical literature to analysis of technical problems.
9. \*Listen to technical lectures and apply these lectures to technical problems.

- **COURSE CONTENT:**

- I. Tensile test of steel
- II. Charpy impact tests
- III. Cold working
- IV. Recrystallization
- V. Creating phase diagrams
- VI. TTT Curves
- VII. Hardenability Jominy test
- VIII. Heat treatments of steel
- IX. Semiconductors
- X. Corrosion of metals
- XI. Plastics, composites
- XII. Wood
- XIII. Precipitation hardening in aluminum
- XIV. Report writing techniques

- **TYPICAL HOMEWORK ASSIGNMENTS:** (Do not include in-class work, quizzes, or tests)  
This information is necessary for all credit courses. Assignments should be closely related to course objectives, content, and methods of evaluation. (See sample of a "Model Outline" in the AP&P Standards & Practices Handbook.) Include a range of

assignments (minimum of three) from which faculty may choose when designing their syllabus.

1. Describe nature and frequency of typical reading assignments if applicable; note if any are required:

Reading may include approximately 30 pages from the textbook and technical journals.

2. Describe nature and frequency of typical writing assignments if applicable; note if any are required:

Writing assignments may include, but are not limited to, keeping a journal of lab tests and data, plus writing summary lab reports with conclusions.

3. Describe nature and frequency of typical computational assignments if applicable; note if any are required:

Most of the assignments involve calculations utilizing algebra, trigonometry and elementary calculus.

4. Describe other types of homework assignments that students may be asked to complete (oral presentations; special projects; visual/performing arts; etc); note if any are required:

N/A

For categories 1-4 above, list the estimated hours per week it would take a student to complete assignments. Title 5 (section 55002) requires that each unit must be shown to require three hours of work per week by the student either in or out of class. Homework formula: 3 hours of class work times each unit of credit minus classroom hours equals required homework hours.

Reading Assignments: 3

Writing Assignments: 5

Computational Assignments: 2

Other Assignments: 0

- o **METHODS OF INSTRUCTION:** (Methods must be consistent with content and appropriate to objectives; state in terms of what instructor will be doing in order to present course content to students: for example, lecture, demonstration, present audio/visual materials; facilitate group work, etc. Do not list specific instructional equipment.)
  - o Lab
  - o Lecture
  - o Other: Some lecture with laboratory experimentation and work. The latter may involve group work.
- o **METHODS OF EVALUATION:** (These must be clearly related to course objectives and reflect course content and assignments in order to comply with Title 5 requirements. Describe what instructor will be looking for when evaluating various assignments and tests in order to determine whether students have met course objectives. Grades must be based on demonstrated proficiency in subject matter and determined, where appropriate, by essays, objective and essay tests, research papers or projects, problem solving exercises, or skills' demonstrations.)
  1. Written reports summarizing the lab tests will be evaluated based on the accuracy of the data interpretation, conclusions drawn from data interpretation. Conciseness and quality of the written reports (Objectives: 1, 2, 3, 4, 5, 6, 7, 8, 9)
  2. Quizzes will be used to verify independent mastery of the learning objectives (Objectives: 1, 2, 3, 4, 5, 6, 7, 8, 9)
- o **SUGGESTED TEXTS OR OTHER INSTRUCTIONAL MATERIALS**  
(List several when possible; include title, author, publisher, date, and latest edition. If older than five years, provide brief rationale.)
  - o Callister and Rethwisch (2010). *Materials Science & Engineering-An Introduction* (8th ed/e). Wiley & Sons .



ANTELOPE VALLEY COLLEGE

## Academic Affairs Course Outline of Record

- **COURSE SUBJECT & NUMBER:** BIOL: 204, 204L
- **COURSE NAME:** General Microbiology
- **COURSE UNITS:** 5
- COURSE HOURS:** Lecture: 3.00 hours weekly / Lab: 6.00 hours weekly; 162 Hours Total
- **COURSE REQUISITES: (Follow format of similar courses found in the college catalog.)**
  - Prerequisite: Completion of CHEM 101, 101L , Completion of BIOL 110 or Completion of BIOL 101, 101L or Completion of BIOL 120 and
  - Advisory: Completion of ENGL 101 , Completion of BIOL 201, 201L , Completion of COMM 103 , Completion of CHEM 102, 102L , Completion of BIOL 202, 202L
- **COURSE DESCRIPTION: (Write a short paragraph providing an overview of topics covered. Be sure to identify target audience--transfer, major, GE, degree/certificate, etc. If repeatable, state the number of times at end of description as (R#).**

This course is designed to present an overview of the biology of microorganisms including bacteria, viruses, protozoa, fungi and helminths. Information is directed towards students in preprofessional programs for nursing, dental hygiene, surgical technology, physicians assistant, food science, environmental monitoring, animal and crop sciences as well as biological science majors. Wherever possible, new development in Biotechnology, Virology and Immunology are discussed to provide students with current knowledge in this important field of science. The laboratory introduces a broad spectrum of microorganisms and the concepts and techniques required to identify and classify unknown bacteria. (CSU, UC, AVC)
- **COURSE OBJECTIVES: ( Title 5 requires that courses show evidence of critical thinking skills. Use Bloom's taxonomy to formulate concise, performance-based measurable objectives common to all students. Objectives must be closely aligned with course content, assignments, and methods of evaluation)**

**Upon completion of course, the successful student will be able to**

  1. Define microbial morphology, physiology, behavior and ecology.
  2. Discuss microbial metabolism and compare cellular processes to those of the human host.
  3. Describe, analyze and evaluate interactions that operate between microbes and the host organism in disease and in health.
  4. Describe the bacteria, viruses, protozoa, fungi and helminths responsible for common diseases.
  5. Understand the role of microorganisms in food production, water contamination and sewage treatment.
  6. Define terms necessary to understand human-microbe interaction and epidemiology.
  7. Describe the common sources of infection, pertinent routes of entry and communicability of disease producing microbes.
  8. Describe microbial pathogenesis of specific invasive factors, toxins and other mechanisms by which microbes cause diseases.
  9. Evaluate the role of blood and tissue processes in protecting the host during non-specific defense, the cell-mediated and humoral immunity during specific defense. Appreciate the role of vaccines in disease prevention.
  10. Demonstrate an understanding of microbial genetics, specifically gene expression, genetic transfer and recombination in bacteria, mutations and mutagens and their effects on a microbe.
  11. Develop familiarity with several techniques commonly used in Biotechnology.
  12. Understand and comply with laboratory safety rules and the use of aseptic techniques and methodologies throughout the course.
  13. Demonstrate the ability to identify common bacteria by recognition of cell shape, colony morphology, and physiological characteristics.
- **COURSE CONTENT:**

- I. The Microbial World
  - A. History and Philosophy of Microbiology
  - B. Taxonomy: Organizing, Classifying and Naming Microorganisms
- II. An Overview of the Chemistry of Life
- III. Anatomy of the Prokaryotic Cell
  - A. Cell Structure in Detail
  - B. Bacterial Shapes
  - C. Bacteria with Unusual Characteristics: Rickettsias, Chlamydias and Mycoplasmas
- IV. An Introduction to the Viruses
  - A. Structure, Classification and Life Cycles
- V. Eukaryotic Cells and Microorganisms
  - A. The Protista, the Fungi and the Parasitic Helminths
- VI. Elements of Microbial Nutrition, Ecology and Growth
  - A. Environmental Factors that Influence Microbes
  - B. Binary Fission and the Bacterial Growth Curve
  - C. Ecological Associations Among Microorganisms
- VII. Microbial Metabolism
  - A. An Overview of Enzymes, Aerobic and Anaerobic Cellular Respiration.
- VIII. Microbial Genetics
  - A. An Overview of Bacterial DNA Structure and Replication
  - B. Transcription and Translation
  - C. The Regulation of Bacterial Gene Expression
  - D. Mutations: Changes in the Genetic Material
  - E. Genetic Recombination and Transfer
- IX. Gene Technology
  - A. Tools and Techniques of Biotechnology
  - B. Methods in Recombinant DNA Technology
  - C. Applications of Genetic Engineering
- X. Microbe-Human Interactions
  - A. Portals of Entry
  - B. Attaching to the Host
  - C. Surviving Host Defenses
  - D. Causing Disease: Virulence Factors
  - E. Epidemiology: The Study of Diseases in Populations
- XI. Nonspecific Host Defenses
  - A. Defense Mechanisms of the Host
  - B. Phagocytosis
  - C. Inflammation
  - D. Antimicrobial Substances
- XII. Specific Immunity and Immunization
  - A. Cell-Mediated Immunity
  - B. Humoral Immunity
- XIII. Environmental and Applied Microbiology
  - A. The Natural Recycling of Bioelements
- XIV. Microorganisms and Human Diseases
  - A. Survey of Pathogens
- XV. Students may be asked to prepare and deliver an oral presentation on an advanced topic of microbiology not covered in the previous topics

○ **TYPICAL HOMEWORK ASSIGNMENTS: (Do not include in-class work, quizzes, or tests)**

This information is necessary for all credit courses. Assignments should be closely related to course objectives, content, and methods of evaluation. (See sample of a "Model Outline" in the AP&P Standards & Practices Handbook.) Include a range of assignments (minimum of three) from which faculty may choose when designing their syllabus.

1. Describe nature and frequency of typical reading assignments if applicable; note if any are required:

Students will read a minimum of forty pages weekly. Assignments will include reading in the textbook(s), and reading biweekly laboratory assignments.

2. **Describe nature and frequency of typical writing assignments if applicable; note if any are required:**

Each student will prepare a report describing the methods and explaining all procedures used in the identification of the unknown Gram-positive and Gram-negative bacteria. Students will be required to write brief answers to questions asked in their laboratory manuals. These will include reporting growth characteristics of particular bacteria, describing the rationale for techniques employed in the laboratory and explaining any erroneous results they may encounter. An average of three laboratory reports per week will be required.

3. **Describe nature and frequency of typical computational assignments if applicable; note if any are required:**

Biweekly laboratory sessions will require consistent use of basic arithmetic and algebra calculations, with basic math and chemistry being reviewed in addition to concepts in microbiology. The student needs to multiply, divide, solve fractions and compute ratios. Typical assignments include calculating volumes of media to be prepared, concentrations of media, counting colonies, calculating serial dilutions.

4. **Describe other types of homework assignments that students may be asked to complete (oral presentations; special projects; visual/performing arts; etc); note if any are required:**

Upon the completion of all laboratory exercises the student may conduct an independent investigation of two unknown bacteria from a mixed culture. The student will demonstrate the mastery of all techniques and concepts presented throughout the course. In addition to the identification of unknown bacteria, students may be asked to prepare and deliver an oral presentation on an advanced topic of microbiology.

For categories 1-4 above, list the estimated hours per week it would take a student to complete assignments. Title 5 (section 55002) requires that each unit must be shown to require three hours of work per week by the student either in or out of class. Homework formula: 3 hours of class work times each unit of credit minus classroom hours equals required homework hours.

Reading Assignments: 7

Writing Assignments: 1

Computational Assignments: 1

Other Assignments: 1

o **METHODS OF INSTRUCTION: (Methods must be consistent with content and appropriate to objectives; state in terms of what instructor will be doing in order to present course content to students: for example, lecture, demonstration, present audio/visual materials; facilitate group work, etc. Do not list specific instructional equipment.)**

- o Lab
- o Lecture
- o Other: Boardwork; notes projected from transparencies or presentation software supplemented with multimedia. Laboratory modules are introduced by the instructor, who provides essential background material in lecture/demonstration format. Laboratory modules then are completed by the students, working in groups or individually, and may involve preparation, inoculation of culture media and reading results of their experiments, preparing and staining bacterial smears and observation of microscopic slides. An independent identification of unknown bacteria is given during and at the end of the semester, where accumulated knowledge of techniques and interpretation of results is evaluated.

o **METHODS OF EVALUATION: (These must be clearly related to course objectives and reflect course content and assignments in order to comply with Title 5 requirements. Describe what instructor will be looking for when evaluating various assignments and tests in order to determine whether students have met course objectives. Grades must be based on demonstrated proficiency in subject matter and determined, where appropriate, by essays, objective and essay tests, research papers or projects, problem solving exercises, or skills' demonstrations.)**

1. A minimum of three midterm examinations. (Objectives: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11)
2. Final examination. (Objectives: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11)
3. Essay items (Objectives: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11)
4. Multiple choice questions (Objectives: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11)
5. Bacterial Identification (Objectives: 12, 13)
6. Preparing a report about the methods, techniques and interpretation used in the identification of unknown bacteria (Objectives: 12, 13)

7. Evaluating the oral presentation if required. (Objectives: 4, 5, 8, 10, 11)

o **SUGGESTED TEXTS OR OTHER INSTRUCTIONAL MATERIALS**

(List several when possible; include title, author, publisher, date, and latest edition. If older than five years, provide brief rationale.)

- o Black Jacqueline. (2008). *MICROBIOLOGY: PRINCIPLES AND EXPLORATIONS* (7th/e). Wiley Press.
- o Bauman Robert (2011). *MICROBIOLOGY: With Diseases by Taxonomy* (3rd/e). -.
- o Cowan M.K., Talaro K. (2009). *MICROBIOLOGY: A SYSTEMS APPROACH* (2nd/e). McGraw-Hill.
- o -. *SYMBIOSIS MICRBIOLGY LAB MANUAL*. Pearson Custom publishing, .
- o Microbiology Laboratory Exercises (Downloadable) (2010) Dr. B. Salameh and Dr. G. Shahla
- o CLASS STUDY GUIDE (2011) Dr. Anne Hemsley (Downloadable Notes)
- o Leboffe M., Pierce B. A Photographic Atlas for the Microbiology Laboratory, 2005

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ANTELOPE VALLEY COLLEGE

## Academic Affairs Course Outline of Record

- o **COURSE SUBJECT & NUMBER:** BIOL: 202, 202L
- o **COURSE NAME:** General Human Physiology
- o **COURSE UNITS:** 4
- COURSE HOURS:** Lecture: 3.00 hours weekly / Lab: 3.00 hours weekly; 108 Hours Total
- o **COURSE REQUISITES: (Follow format of similar courses found in the college catalog.)**
  - Prerequisite: Completion of CHEM 101, 101L , Completion of BIOL 201, 201L and
  - Advisory: Eligibility for ENGL 101 and Eligibility for MATH 070 , Eligibility for College Level Reading (CLR)
- o **COURSE DESCRIPTION: (Write a short paragraph providing an overview of topics covered. Be sure to identify target audience--transfer, major, GE, degree/certificate, etc. If repeatable, state the number of times at end of description as (R# ).**

An analysis of basic processes of the human body, emphasizing the coordinated physical and chemical mechanisms of cell biology, neuromuscular, cardiovascular, respiratory, digestive, immune, renal, endocrine and reproductive systems. Includes work with computerized instrumentation and living animals. Completion of this course requires full participation and use of all laboratory material. NOTE: This course is necessary for students entering many healthcare professions including the Associate Degree Nursing Program. It is also applicable for transfer students in the biological sciences. [CAN BIOL 12] (CSU, UC, AVC)

- o **COURSE OBJECTIVES: ( Title 5 requires that courses show evidence of critical thinking skills. Use Bloom's taxonomy to formulate concise, performance-based measurable objectives common to all students. Objectives must be closely aligned with course content, assignments, and methods of evaluation)**

**Upon completion of course, the successful student will be able to**

1. Define, discuss, use and analyze concepts and principles relating to basic cellular and biochemical processes, including membrane transport, enzyme activity, energy transfer and metabolism, protein synthesis and the replication and expression of genetic information.
2. Discuss and apply basic mechanisms of membrane potentials and explain or differentiate the factors influencing the generation, propagation and synaptic transmission of nerve impulses and explain how sensory information is coded and processed by the brain.
3. Describe the physiology of motor activity by comparing and explaining the mechanisms of skeletal muscle excitability, contractility, metabolism and mechanics.
4. Discuss, integrate and assemble the concepts of heart and circulatory dynamics, blood reactions, immunological responses, respiratory mechanics, gas exchange and transport, digestion, absorption, gastrointestinal secretion and regulation of motility.
5. Explain and differentiate between renal and endocrine mechanisms that help maintain fluid, electrolyte and pH homeostasis in the body.
6. Describe the principles of hormonal control and discuss and analyze the involvement of the endocrine in metabolic regulation and reproductive physiology.
7. In the lab, students will demonstrate and test physiological concepts using computerized instrumentation, living animals, and their own bodies. They will analyze data, make computations, formulate conclusions and be able to compose laboratory reports in accordance with the scientific method.

- o **COURSE CONTENT:**

- I. Cell and Molecular Physiology
  - A. Atoms, molecular bonding, cell membranes and enzymes
  - B. Metabolic pathways

- C. Protein synthesis, gene expression and mutation
- D. Lab activities to include:
  1. Diffusion, osmosis and hemolysis
  2. Enzyme kinetics
  3. Cellular respiration
  4. DNA extraction
- II. Neuromuscular Physiology
  - A. The neuron and action potentials
  - B. Receptors, spinal reflexes and processing of sensation
  - C. Muscle physiology and mechanics
  - D. Lab activities to include:
    1. Use of data recording devices
    2. Recording of nerve APs or EMGs
    3. Skeletal muscle mechanics
- III. Cardiovascular, Respiratory, Digestive and Immune Physiology
  - A. Heart and peripheral circulation
  - B. Blood and blood reactions
  - C. Immunology
  - D. Respiratory physiology
  - E. Lab activities to include:
    1. Cardiac activity and ECG
    2. Blood cell parameters and typing
    3. Respiratory regulation
- IV. Renal, Endocrine and Reproductive Physiology
  - A. Renal physiology
  - B. Endocrine and metabolic physiology
  - C. Reproductive physiology
  - D. Lab activities to include:
    1. Urinalysis
    2. Projects in Endocrinology

o **TYPICAL HOMEWORK ASSIGNMENTS: (Do not include in-class work, quizzes, or tests)**

**This information is necessary for all credit courses. Assignments should be closely related to course objectives, content, and methods of evaluation. (See sample of a "Model Outline" in the AP&P Standards & Practices Handbook.) Include a range of assignments (minimum of three) from which faculty may choose when designing their syllabus.**

**1. Describe nature and frequency of typical reading assignments if applicable; note if any are required:**

Students will read a minimum of 50 pages weekly. Assignments will include applicable chapters in the textbook, weekly laboratory exercises in the lab manual and other handouts or study materials.

**2. Describe nature and frequency of typical writing assignments if applicable; note if any are required:**

Students will be required to write brief answers to questions in their laboratory manual or answer similar questions on weekly lab reports and/or quizzes.

In small groups, students will design and execute a two-week laboratory experiment in mammalian endocrinology. The data will be collected and analyzed on an individual basis to write a formal research paper in scientific style.

**3. Describe nature and frequency of typical computational assignments if applicable; note if any are required:**

Weekly laboratory exercises require the use of basic arithmetic and algebraic skills. Students will multiply, divide, solve fractions, compute percentages, manipulate linear equations and use formulate to calculate physiological measurements.

**4. Describe other types of homework assignments that students may be asked to complete (oral presentations; special projects; visual/performing arts; etc); note if any are required:**

In preparation for some exams or lab work, students may use the library or internet resources to research relevant topics.

**For categories 1-4 above, list the estimated hours per week it would take a student to complete assignments. Title 5**



(section 55002) requires that each unit must be shown to require three hours of work per week by the student either in or out of class. Homework formula: 3 hours of class work times each unit of credit minus classroom hours equals required homework hours.

Reading Assignments:	<u>12</u>
Writing Assignments:	<u>3</u>
Computational Assignments:	<u>1</u>
Other Assignments:	<u>1</u>

- **METHODS OF INSTRUCTION:** (Methods must be consistent with content and appropriate to objectives; state in terms of what instructor will be doing in order to present course content to students: for example, lecture, demonstration, present audio/visual materials; facilitate group work, etc. Do not list specific instructional equipment.)
  - Lab
  - Lecture
  - Observation and Demonstration
  - Other: Multimedia software or transparencies, printed lecture guides, computer animations and/or other audiovisual media. Laboratory exercises or lab demonstrations utilizing live animals or human subjects and analog and digital instrumentation to illustrate physiological principles considered in lecture.
- **METHODS OF EVALUATION:** (These must be clearly related to course objectives and reflect course content and assignments in order to comply with Title 5 requirements. Describe what instructor will be looking for when evaluating various assignments and tests in order to determine whether students have met course objectives. Grades must be based on demonstrated proficiency in subject matter and determined, where appropriate, by essays, objective and essay tests, research papers or projects, problem solving exercises, or skills' demonstrations.)
  1. Three midterm lecture examinations and one final examination will be given to cover the objectives of each study area. Their format will include a true/false or multiple-choice section, a portion devoted to comprehension of terminology, and short answer questions and/or essay questions, some requiring critical interpretation of practical or clinical scenarios. (Objectives: )
  2. A laboratory quiz will be given or a report assigned each week when a lecture exam is not scheduled. These will cover the objectives and outcomes of each week's lab work. (Objectives: )
  3. A written report of a group laboratory project in endocrinology will be evaluated to its conformity with scientific format and how well the project's hypothesis is achieved and evaluated. (Objectives: )
- **SUGGESTED TEXTS OR OTHER INSTRUCTIONAL MATERIALS**  
(List several when possible; include title, author, publisher, date, and latest edition. If older than five years, provide brief rationale.)
  - Weidmaier, Raffand Strang (2006). *Human Physiology - The Mechanisms of Body Function* (10th/e). McGraw-Hill, Inc..
  - Stephen Langjahr (2006). *Lab Exercises for Biology 202 - Human Physiology* (4th/e). -.



ANTELOPE VALLEY COLLEGE

## Academic Affairs Course Outline of Record

- **COURSE SUBJECT & NUMBER:** BIOL: 201, 201L
- **COURSE NAME:** General Human Anatomy
- **COURSE UNITS:** 4
- **COURSE HOURS:** Lecture: 2.00 hours weekly / Lab: 6.00 hours weekly; 144 Hours Total
- **COURSE REQUISITES: (Follow format of similar courses found in the college catalog.)**  
 Prerequisite: Completion of BIOL 120 , Completion of BIOL 100, 100L or Completion of BIOL 101, 101L or Completion of BIOL 110 or  
 Advisory: Eligibility for College Level Reading (CLR) and Eligibility for MATH 070
- **COURSE DESCRIPTION: (Write a short paragraph providing an overview of topics covered. Be sure to identify target audience--transfer, major, GE, degree/certificate, etc. If repeatable, state the number of times at end of description as (R# ).**  

Introduction to the structure and function of the human body. Included are lectures and demonstrations using models, isolated specimens and multimedia images of human anatomy. Laboratory study includes demonstrations and dissections of a cat and other animal and human material, including the cadaver. Completion of this class requires full participation and use of all lab materials. NOTE: This course is taken by students who wish to enter the Associate Degree Nursing Program, students who plan to combine their education in various healthcare fields, and students who plan to transfer to four-year institutions to major in biology. (CSU, UC, AVC)
- **COURSE OBJECTIVES: ( Title 5 requires that courses show evidence of critical thinking skills. Use Bloom's taxonomy to formulate concise, performance-based measurable objectives common to all students. Objectives must be closely aligned with course content, assignments, and methods of evaluation)**  
**Upon completion of course, the successful student will be able to**
  1. Define and describe anatomical directional terms and cavities.
  2. List, explain and diagram the parts of a typical human cell.
  3. Distinguish, differentiate and categorize tissue types and describe their body locations.
  4. Name and recognize the layers of skin and describe their functions.
  5. Distinguish the gross and microscopic characteristics of a typical bone.
  6. Identify all of the bones of the body and their markings.
  7. Explain the methods of ossification.
  8. Compare and contrast the axial and appendicular skeletons.
  9. Distinguish and describe the types of skeletal articulations.
  10. Recognize and compare the muscle types and recall the name and actions of the major muscles of the body.
  11. Identify the components of blood and their functions. Describe the heart. Formulate and apply circulation plans around the body. Recall and describe the lymphatic system.
  12. Describe the organization of the nervous system. Describe the structural and functional nerve cell types. Recall the parts of the brain and relate their functions. List the cranial and major spinal nerves and their functions. Differentiate between and describe the subdivisions of the autonomic nervous system and explain their function. Identify and demonstrate the parts of the eye and ear, and their functions.
  13. Distinguish between the endocrine glands and explain the functions of their related hormones.
  14. Name, describe and recognize the organs and tissues of the respiratory, digestive and urinary systems and describe the function and relative location of each.
  15. Recognize and explain the reproductive structures and distinguish between the male and female elements.
  16. Recognize and correctly identify gross and microscopic specimens of animal or human material made available for study

in the laboratory.

o **COURSE CONTENT:**

- I. Introduction
  - A. Terminology
  - B. Body Cavities
  - C. Cytology
  - D. Histology
- II. Integument and Skeletal System
  - A. Skin
  - B. Osseous tissue
    - 1. Axial Division
    - 2. Appendicular Division
- III. Articular System
- IV. Muscular Systems
  - A. Skeletal muscle
  - B. Smooth muscle
  - C. Cardiac muscle
- V. Nervous system
  - A. Neural tissue
  - B. Central Nervous System
    - 1. Brain
    - 2. Spinal cord
  - C. Peripheral Nervous System
    - 1. Cranial nerves
    - 2. Spinal nerves
  - D. Autonomic Nervous System
    - 1. Sympathetic Division
    - 2. Parasympathetic Division
  - E. Special Senses
    - 1. Eye
    - 2. Ear
- VI. Cardiovascular System
  - A. Blood
  - B. Heart
  - C. Vessels and Circulation
- VII. Lymphatic System
- VIII. Respiratory System
- IX. Digestive System
- X. Urinary System
- XI. Endocrine System
- XII. Reproductive System
  - A. Male
  - B. Female

o **TYPICAL HOMEWORK ASSIGNMENTS: (Do not include in-class work, quizzes, or tests)**

**This information is necessary for all credit courses. Assignments should be closely related to course objectives, content, and methods of evaluation. (See sample of a "Model Outline" in the AP&P Standards & Practices Handbook.) Include a range of assignments (minimum of three) from which faculty may choose when designing their syllabus.**

**1. Describe nature and frequency of typical reading assignments if applicable; note if any are required:**

Students will read a minimum of 30 pages a week. Readings will include their text, lecture guide and laboratory manual.

**2. Describe nature and frequency of typical writing assignments if applicable; note if any are required:**

Students will be required to write brief answers and label diagrams in their laboratory manual. Students will be required to name and describe the actions of major human skeletal muscles.

3. Describe nature and frequency of typical **computational** assignments if applicable; note if any are required:

An understanding of mathematical concepts will be required to appreciate size relationships involved in microscopic anatomy and gross anatomy.

4. Describe other types of homework assignments that students may be asked to complete (oral presentations; special projects; visual/performing arts; etc); note if any are required:

Using texts, lab manuals, atlases and other home resources, students will be required to

1. Distinguish between bones and identify their features and articulations.
2. Analyze, recall and categorize major body muscles, and their primary actions.
3. Differentiate between and describe the tissues that comprise organs and systems.
4. Relate the structure of organs and parts of each body system to their functions.

For categories 1-4 above, list the estimated hours per week it would take a student to complete assignments. Title 5 (section 55002) requires that each unit must be shown to require three hours of work per week by the student either in or out of class. Homework formula: 3 hours of class work times each unit of credit minus classroom hours equals required homework hours.

Reading Assignments: 8  
 Writing Assignments: 0.5  
 Computational Assignments: 0.5  
 Other Assignments: 2

- **METHODS OF INSTRUCTION:** (Methods must be consistent with content and appropriate to objectives; state in terms of what instructor will be doing in order to present course content to students: for example, lecture, demonstration, present audio/visual materials; facilitate group work, etc. Do not list specific instructional equipment.)
  - Instructor led Discussion
  - Lab
  - Lecture
- **METHODS OF EVALUATION:** (These must be clearly related to course objectives and reflect course content and assignments in order to comply with Title 5 requirements. Describe what instructor will be looking for when evaluating various assignments and tests in order to determine whether students have met course objectives. Grades must be based on demonstrated proficiency in subject matter and determined, where appropriate, by essays, objective and essay tests, research papers or projects, problem solving exercises, or skills' demonstrations.)
  1. Grading of lecture examinations and one final examination. Examinations will include completion, description, and application questions. (objectives 1-15) Completion questions require one word to a few sentence responses. Description questions require descriptions of terms or simple diagrams or elaboration of structural or functional relationships. Application questions are problem solving, critical thinking questions that involve evaluation, assessment, comparison, etc. (Objectives: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15)
  2. Grading in laboratory includes three laboratory practical examinations. In these exams, students have to identify, differentiate, interpret and relate material presented during lab demonstrations, microscopy, and dissections. (Objectives: 16)
- **SUGGESTED TEXTS OR OTHER INSTRUCTIONAL MATERIALS**  
 (List several when possible; include title, author, publisher, date, and latest edition. If older than five years, provide brief rationale.)
  - McKinley and Dean O'Loughlin (2008). *Human Anatomy* (2nd/e). McGraw Hill Publishers.
  - Laboratory Exercises for General Human Anatomy, edited by Stephen Langjahr, et al, revised annually.



ANTELOPE VALLEY COLLEGE

## Academic Affairs Course Outline of Record

- o **COURSE SUBJECT & NUMBER:** BIOL: 120
- o **COURSE NAME:** General Organismal, Ecological, and Evolutionary Biology
- o **COURSE UNITS:** 5
- o **COURSE HOURS:** Lecture: 4.00 hours weekly / Lab: 3.00 hours weekly; 126 Hours Total
- o **COURSE REQUISITES: (Follow format of similar courses found in the college catalog.)**  
 Prerequisite: Completion of MATH 102 ,  
 Advisory: Completion of a general biology course and/or Eligibility for College Level Reading (CLR) and Eligibility for ENGL 101 , Completion of BIOL 110
- o **COURSE DESCRIPTION: (Write a short paragraph providing an overview of topics covered. Be sure to identify target audience--transfer, major, GE, degree/certificate, etc. If repeatable, state the number of times at end of description as (R#).**

A comprehensive, in-depth course designed for Biology majors to compliment the cell-molecular perspective presented in Biology 110. A survey of multicellular organisms, emphasizing morphology, systematics, evolution, physiology, heredity, development, behavior and ecology. Laboratories consist of dissection and analyses of representative taxa and student projects. Data analysis and preparation of scientific reports are taught and applied to individual research projects.

- o **COURSE OBJECTIVES: ( Title 5 requires that courses show evidence of critical thinking skills. Use Bloom's taxonomy to formulate concise, performance-based measurable objectives common to all students. Objectives must be closely aligned with course content, assignments, and methods of evaluation)**

**Upon completion of course, the successful student will be able to**

1. Categorize representative plants and animals to the levels of phylum, subphylum, and class; explain the rationale behind the systematics and taxonomy in current usage.
2. Examine the concept of evolution by natural selection by application to identifiable morphology found in a series of plants (i.e. bryophytes through angiosperms) and animals (i.e. poriferans through chordates).
3. Compare and contrast significant morphological, physiological and ecological aspects of a phylogenetic series of plants (i.e. bryophytes through angiosperms) and animals (poriferans through chordates).
4. Use a college or university library to find scientific articles related to particular research projects. Apply simple descriptive statistics to data for term projects. Organize observations, hypotheses, data collection, analyses and conclusions into standard format of modern scientific journals of the life sciences.
5. Prepare and present a formal scientific talk (about 15 minutes in duration) about a particular research project.

- o **COURSE CONTENT:**

- I. Principles of Evolution
  - A. Darwinian theory
  - B. Evidence for evolution
  - C. Mechanisms of evolution
- II. Principles of Speciation
  - A. Definition of a species
  - B. Geographical speciation
  - C. Sympatric speciation
  - D. Temporal speciation
- III. Principles of Systematics and Phylogeny
  - A. definition of systematics

- B. definition of taxonomy
- C. How organisms are classified and named
- D. Evolution and systematics
- E. Problems in systematics
- IV. Principles of Population Biology
  - A. Gene pool and population genetics
  - B. Hardy-Weinberg Equilibrium
  - C. Population bottlenecks
  - D. Founder effect
  - E. Extinction
- V. Principles of descriptive Embryology
  - A. Fertilization through cleavage: Sea Urchin and Frog
  - B. Cleavage through gastrulation: Sea Urchin and Frog
  - C. Neurulation: Sea Urchin, Frog and Chick
  - D. Tissue interactions and development
- VI. Survey of Diversity
  - A. Non-vascular Plants (Bryophytes)
  - B. Vascular Plants (Ferns through Angiosperms)
  - C. Porifera
  - D. Cnidaria
  - E. Platyhelminthes
  - F. Nematoda
  - G. Annelida
  - H. Mollusca
  - I. Arthropoda
  - J. Echinodermata
  - K. Chordata
- VII. Principles of Reproduction
  - A. Meiosis
  - B. Mitosis
  - C. Reproduction in Flowering Plants
  - D. Reproduction in Animals
  - E. Evolution of Sex
  - F. Consequences of Sex
- VIII. Principles of Animal Excretion
  - A. Osmosis and Diffusion
  - B. Mammalian Kidney Function
- IX. Vertebrate Circulatory Physiology
  - A. Functions of Blood
  - B. Comparisons of Vertebrate Circulatory Systems
  - C. Oxygen Disassociation Curves Compared
- X. Homeostasis
  - A. Thermoregulation in reptiles and mammals
  - B. Vertebrate Endocrine System: Form and Function
- XI. Sociobiology
  - A. Overview of animal social systems
  - B. Central Principle of Sociobiology
  - C. Human Sociobiology
- XII. Principles of Ecology and Biogeography
  - A. Biogeographic Regions
  - B. Desert and Chaparral Communities
  - C. Keystone Species: The Joshua Tree
  - D. Conservation of Natural Resources

o **TYPICAL HOMEWORK ASSIGNMENTS: (Do not include in-class work, quizzes, or tests)**

This information is necessary for all credit courses. Assignments should be closely related to course objectives, content, and methods of evaluation. (See sample of a "Model Outline" in the AP&P Standards & Practices Handbook.) Include a range of assignments (minimum of three) from which faculty may choose when designing their syllabus.

1. Describe nature and frequency of typical reading assignments if applicable; note if any are required:

1. Describe nature and frequency of typical reading assignments if applicable; note if any are required:
  1. Weekly chapter assignments ( e.g. Sadava et. al) following material in lecture syllabus.
  2. Weekly chapter assignments ( e.g. Ambrose & Ambrose) following subject material in lab syllabus.
  3. Library research: Journals with articles pertaining to student's research topic; minimum of 10 refereed journals for the term report- required.
  4. Assigned readings from selected articles.

2. Describe nature and frequency of typical writing assignments if applicable; note if any are required:

1. Weekly Lab question/answers or reports to problems and demonstrations in Lab - required.
2. Term Report: 10-20 pages of scientific writing on an approved research topic- required.
3. Keep a well annotated, accurate journal of all field and lab work.

3. Describe nature and frequency of typical computational assignments if applicable; note if any are required:

1. Calculating Hardy-Weinberg equilibrium equations (lab/lecture )--required
2. Calculating gene frequencies (lab)- required.
3. Calculating and analyzing Life-tables.
4. Estimating population by Mark-Recapture calculations.
5. Calculating & Interpreting population growth rate.
6. Calculating & Interpreting Shannon Diversity Index.

4. Describe other types of homework assignments that students may be asked to complete (oral presentations; special projects; visual/performing arts; etc); note if any are required:

1. Conduct computer -data base and internet search for articles related to individual projects.

For categories 1-4 above, list the estimated hours per week it would take a student to complete assignments. Title 5 (section 55002) requires that each unit must be shown to require three hours of work per week by the student either in or out of class. Homework formula: 3 hours of class work times each unit of credit minus classroom hours equals required homework hours.

Reading Assignments:	<u>5</u>
Writing Assignments:	<u>4</u>
Computational Assignments:	<u>1.5</u>
Other Assignments:	<u>1</u>

o **METHODS OF INSTRUCTION: (Methods must be consistent with content and appropriate to objectives; state in terms of what instructor will be doing in order to present course content to students: for example, lecture, demonstration, present audio/visual materials; facilitate group work, etc. Do not list specific instructional equipment.)**

- o Instructor led Discussion
- o Instructor led Problem Solving
- o Lab
- o Lecture
- o Other: visual aids (ORT; videos; internet; slides) showing diagrams, charts, photos. One hour per week answering discussion questions at the end of the chapters in the lecture text (e.g. Sadava, et. al). Three hours per week in laboratory: examining specimens; making measurements; demonstrating dissections and making comparisons of plant and animal taxa. Instructor may provide approval of term project and guidance throughout the course.

o **METHODS OF EVALUATION: (These must be clearly related to course objectives and reflect course content and assignments in order to comply with Title 5 requirements. Describe what instructor will be looking for when evaluating various assignments and tests in order to determine whether students have met course objectives. Grades must be based on demonstrated proficiency in subject matter and determined, where appropriate, by essays, objective and essay tests, research papers or projects, problem solving exercises, or skills' demonstrations.)**

1. Assessment of written responses on periodic exams for comprehension of concepts presented in class and their application to current theories in biology. (Objectives: 1, 2, 3)
2. Assessment of laboratory multiple choice test questions or lab reports relating to the current and previous week's

assignments. (Objectives: 1, 2, 3)

3. Assessment of laboratory and field notebook, including evaluation of accuracy of drawings, diagrams and descriptions of materials and concepts presented in laboratory. (Objectives: 1, 3)
4. Evaluation of oral presentations of student term projects, following standard scientific protocol and guidelines given for oral presentations. (Objectives: 4, 5)
5. Evaluation of written scientific term reports, following standard scientific protocol and guidelines given for term reports. (Objectives: 4, 5)
6. Assessment of written responses and comprehension of text chapter questions about concepts presented in class. (Objectives: 1, 2, 3)

o **SUGGESTED TEXTS OR OTHER INSTRUCTIONAL MATERIALS**

**(List several when possible; include title, author, publisher, date, and latest edition. If older than five years, provide brief rationale.)**

- o Sadava, D., Hillis, D.M. Heller, H.C ., & Berenbaum, M.R (2011). *Life: The Science of Biology* (9th/e). Sinauer Freeman.
- o Ambrose, H.W. III, K.P. Ambrose, Emlen, D.J., Bright, K.L. (2007). *A Handbook of Biological Investigation* (7th/e). Hunter Textbook Inc..
- o An optional biology Photoatlas to aid students with materiel seen in lab.  
Van De Graaf, K.M. & Crawley, J.L. 2009. *A Photographic Atlas for Biology* (6th edition). Morton Publishing Company.





ANTELOPE VALLEY COLLEGE

## Academic Affairs Course Outline of Record

- o **COURSE SUBJECT & NUMBER:** BIOL: 110
- o **COURSE NAME:** General Molecular Cell Biology
- o **COURSE UNITS:** 5
- o **COURSE HOURS:** Lecture: 4.00 hours weekly / Lab: 3.00 hours weekly; 126 Hours Total
- o **COURSE REQUISITES: (Follow format of similar courses found in the college catalog.)**  
 Prerequisite: Completion of MATH 102 and Completion of CHEM 110 or concurrent enrollment ,  
 Advisory: Eligibility for ENGL 101 , Eligibility for College Level Reading (CLR) and Completion of a general biology course is recommended.
- o **COURSE DESCRIPTION: (Write a short paragraph providing an overview of topics covered. Be sure to identify target audience--transfer, major, GE, degree/certificate, etc. If repeatable, state the number of times at end of description as (R# ).**

A comprehensive and in-depth introduction for all biology majors (as well as physics, chemistry, engineering, computer science, and math majors who will concern themselves with biology) to the unifying principles of modern cellular biology, molecular biology, and biochemistry. Topics include the structure of the atom, quantum mechanics, the nature of the chemical bond, general principles of thermodynamics and equilibrium, prokaryotic and eukaryotic cell structure, lipid chemistry and membrane biology, protein structure and function, photosynthesis and cellular respiration, nucleic acids (DNA and RNA) and their role in protein synthesis, principles of classical and molecular genetics, the control of gene expression, cell signaling systems, molecular embryology, evolutionary developmental biology, and biotechnology. Lab work includes investigations with live bacteria, protists, flowering plants and fruit flies as model organisms, and includes experiments in photosynthesis, enzymology, gel-electrophoresis, genetics, and biotechnology. The course stresses evolutionary mechanisms.

- o **COURSE OBJECTIVES: ( Title 5 requires that courses show evidence of critical thinking skills. Use Bloom's taxonomy to formulate concise, performance-based measurable objectives common to all students. Objectives must be closely aligned with course content, assignments, and methods of evaluation)**

**Upon completion of course, the successful student will be able to**

1. Describe the nuclear and electronic structure of any atom given its atomic number and mass.
2. Define in wave and quantum mechanical terms what atomic and molecular electron orbitals are, and what conditions must be met for an orbital to gain or emit light.
3. Explain with a labeled diagram of a Morse potential function the nature of a chemical bond, and list the energies of covalent, ionic, hydrogen and Van der Waals bonds.
4. Construct a complete structural diagram of any organic molecule given its simplified line diagram, and predict what regions of the molecule would be flexible as opposed to rigid, and hydrophobic as opposed to hydrophilic.
5. Draw from memory the structures of glucose, ATP, a membrane phospholipid, an amino acid, a polypeptide chain, and an A-T and G-C base pair of a DNA double helix.
6. State from memory, define the variables of, describe the intuitive meaning of, and solve simple problems with four key equations from thermodynamics.
7. Illustrate with a labeled diagram the primary, secondary, tertiary and quaternary structure of a protein.
8. Construct a diagram showing the internal structure of a bacteria, a plant cell, and an animal cell.
9. Construct a diagram showing in broad outline the presumed evolutionary lines of descent which have allowed living cells to give rise to all the kingdoms of life on earth.
10. Sketch a diagram showing how a plant cell uses the energy of sunlight to generate ATP through the reactions of photosynthesis, glycolysis, and cellular respiration.

11. Describe with a labeled diagram the central dogma of biology, including the roles of DNA, RNA polymerase, messenger RNA, the ribosome, and transfer RNA.
12. Describe with labeled diagrams the process of DNA replication in both prokaryotes and eukaryotes, including the key enzymes, and discuss the ramifications of the error rates of DNA polymerase and the DNA repair system for disease, aging, and evolution.
13. Transcribe on paper a sequence of base-pairs in DNA into mRNA, use the genetic code to translate the mRNA into a protein, and predict the effect of various mutations to the DNA on the functionality of the resulting protein.
14. Describe with a labeled diagram the biochemistry of the lactose operon, and predict how various mutations to genes in the operon would affect a bacteria's ability to grow on lactose as a sole carbon source.
15. Design a diagram showing how looped DNA domains containing genes are organized in a eukaryotic chromosome, and describe the mechanisms which control gene expression in eukaryotes.
16. Describe the major themes of classical animal embryology, including cleavage, blastulation, gastrulation, cell junctions, extracellular matrix material, cell-signaling systems, and the role of morphogens and selector genes in development.
17. Appraise the ability of the new field of evolutionary-developmental biology ("Evo-Devo") to explain macroevolutionary events.
18. Demonstrate an ability to formulate meaningful research questions in molecular-cell biology, design controlled scientific experiments to investigate those questions, perform those experiments, and write up the results in publishable format.
19. Conduct laboratory investigations which include: identification under the optical microscope of bacteria, protists, and plant and animal tissues; culture and classic genetics of fruit flies; measurement of a diffusion coefficient of a molecule in agar; performance of color titrations on dilutions of acids and bases; culture of bacteria and performance of a DNA transformation experiment; simple enzyme assays; culture of a photosynthetic protist; performance of a restriction enzyme digest of DNA and agarose gel electrophoresis of the fragments; isolation and ethanol precipitation of DNA from a tissue; isolation of photosynthetic pigments using paper chromatography and analysis of their absorption spectra with a visible spectrophotometer; and isolation of a protein using column chromatography.

o **COURSE CONTENT:**

- I. Key Concepts of General Chemistry
  - A. Nuclear and electronic structure of atoms
  - B. Absorption and emission of light
  - C. The nature of the chemical bond
  - D. Thermodynamics, free energy, entropy, equilibria
  - E. Acid-base chemistry
- II. Key Concepts of Organic Chemistry
  - A. Structural diagrams of organic molecules
  - B. Functional groups in organic molecules
  - C. Bond rotation and the flexibility of organic molecules
  - D. Hydrophobic and hydrophilic structures
- III. Biological Macromolecules
  - A. Protein chemistry and proteins as molecular machines
  - B. Lipids and membrane biochemistry
  - C. Carbohydrates
  - D. Nucleotides and Nucleic acids: DNA and RNA
- IV. Cells as the Basic Units of Life
  - A. Prokaryotic Cells: Eubacteria and Archaea
  - B. Eukaryotic Cells: Protists and the Dawn of Eukaryotes
    1. The nucleus
    2. The endomembrane system
    3. Energy-processing organelles
    4. Other subcellular organelles
    5. The cell cytoskeleton
    6. Extracellular matrix and cell junctions
- V. Enzymes and the Regulation of Metabolism
- VI. Bioenergetics
  - A. General principles of bioenergetics

1. Driving uphill reactions with bigger downhill reactions
  2. Charge separation and the power of falling electrons
  3. How ATP powers protein machines
  4. Glucose as a storer of high energy electrons
  5. ATP synthase and the power of proton gradients
- B. Storing energy from the sun: photosynthesis
1. Chlorophyll and light-harvesting photosystems
  2. The light-reactions of photosynthesis
  3. Synthesizing glucose: The Calvin-Benson cycle
- C. Energy-Harvesting Processes
1. Glycolysis
  2. Pyruvate oxidation
  3. The Citric Acid Cycle
  4. Oxidative Phosphorylation
  5. Fermentation
- VII. The Central Dogma of Biology
- A. The chemistry of DNA and the concept of the gene
  - B. Messenger RNA, the genetic code and transcription
  - C. Ribosome structure, tRNA, and protein synthesis.
- VIII. The Control of Gene Expression
- A. Gene expression in bacteria using the lactose operon as an example
  - B. Eukaryotic gene expression
    1. Eukaryotic chromosomes and looped domains
    2. Nucleosomes, histone modifications, enhancers, transcription factors, and the mediator
    3. General transcription factors
    4. Supercoiling
    5. Antisense RNA and RNA interference
    6. RNA processing
    7. Post-translational control
- IX. DNA Replication and Repair
- A. Enzymology of Replication and Repair
  - B. Mutation rates and implications for disease, aging, and evolution.
- X. Cell Division
- A. Mitosis and control of the cell division cycle
  - B. Meiosis and the production of gametes
- XI. Principles of Genetics
- A. Mendel's Laws
  - B. Sex-Determination and Sex-linked Inheritance
  - C. Non-nuclear Inheritance
- XII. Cell Signalling Systems
- A. Receptors and their ligands
  - B. Signal amplification and transduction
  - C. Second messengers
- XIII. Developmental Biology
- A. Animal Embryology
    1. Morphogens, selector genes, and pattern formation
    2. Cleavage, blastulation, gastrulation, organogenesis
  - B. Plant Development
    1. General mechanisms of plant embryology
    2. The genetics of flower development
- XIV. Molecular Medicine and Biotechnology
- A. Genetic Disease and Gene Therapy
  - B. Stem cell therapy

- C. Expression systems
  - D. Ethical aspects of Modern Biotechnology
- XV. Mechanisms of Evolution
- A. Ways to mutate DNA
  - B. Protein evolution, functional domains and introns
  - C. Regulatory DNA, altered embryology and principles of evolutionary-developmental biology
  - D. Natural selection and how the environment shapes the genomes of organisms

o **TYPICAL HOMEWORK ASSIGNMENTS: (Do not include in-class work, quizzes, or tests)**

This information is necessary for all credit courses. Assignments should be closely related to course objectives, content, and methods of evaluation. (See sample of a "Model Outline" in the AP&P Standards & Practices Handbook.) Include a range of assignments (minimum of three) from which faculty may choose when designing their syllabus.

1. **Describe nature and frequency of typical reading assignments if applicable; note if any are required:**

Required weekly reading assignments from the textbook.

Required weekly reading assignments from the class study packet.

Once in the semester students will read a primary research article from a leading cell and molecular biology journal.

2. **Describe nature and frequency of typical writing assignments if applicable; note if any are required:**

Required weekly student-made summaries of concepts covered in the lecture.

Required weekly laboratory write-ups.

Once in the semester students will write up the results of a major laboratory project in publishable primary research form.

Once in the semester students may have the opportunity to write a research paper on a topic in molecular cell biology.

3. **Describe nature and frequency of typical computational assignments if applicable; note if any are required:**

About ten required computational assignments during the semester will be carried out on problems including molarity, the preparation of solutions, dilution problems, the laws of diffusion and the calculation of diffusion coefficients, osmotic pressure, and the rates of growth, rate constants and doubling times of cell cultures that are in exponential growth.

4. **Describe other types of homework assignments that students may be asked to complete (oral presentations; special projects; visual/performing arts; etc); note if any are required:**

Other types of assignments may include, but are not limited to, researching and preparing an oral presentation on a current topic in cell and molecular biology.

For categories 1-4 above, list the estimated hours per week it would take a student to complete assignments. Title 5 (section 55002) requires that each unit must be shown to require three hours of work per week by the student either in or out of class. Homework formula: 3 hours of class work times each unit of credit minus classroom hours equals required homework hours.

Reading Assignments: 6

Writing Assignments: 3

Computational Assignments: 1

Other Assignments: 1

o **METHODS OF INSTRUCTION: (Methods must be consistent with content and appropriate to objectives; state in terms of what instructor will be doing in order to present course content to students: for example, lecture, demonstration, present audio/visual materials; facilitate group work, etc. Do not list specific instructional equipment.)**

- o Experiments
- o Individualized Instruction
- o Instructor led Discussion
- o Instructor led Problem Solving
- o Lab
- o Lecture
- o Mediated Learning
- o Observation and Demonstration
- o Projects

- Other: Lecture with intensive graphic support, which may include 35 mm slides, transparencies, presentation software, digitized video clips of organisms, animations of biological processes, and molecular and genetic models. The instructor will supervise laboratory activities and experiments with living organisms including fruit flies, protists, bacteria and plants, as well as prepared microscopic slides and specimens.
- **METHODS OF EVALUATION: (These must be clearly related to course objectives and reflect course content and assignments in order to comply with Title 5 requirements. Describe what instructor will be looking for when evaluating various assignments and tests in order to determine whether students have met course objectives. Grades must be based on demonstrated proficiency in subject matter and determined, where appropriate, by essays, objective and essay tests, research papers or projects, problem solving exercises, or skills' demonstrations.)**
  1. Essay tests, especially on topics requiring critical thinking, such as evolutionary theory and the ethics of biotechnology. (Objectives: 16, 17)
  2. Short answer, multiple choice and true-false tests which rapidly and efficiently test the student's command of large numbers of important facts on topics such as metabolism, genetics, and bioenergetics. (Objectives: 1, 2, 6, 13)
  3. Drawing and diagrammatic tests requiring students to construct and label diagrams explaining complex three-dimensional biological structures and processes, including cell structure, the control of gene expression in chromosomes, and embryology. (Objectives: 3, 4, 5, 7, 8, 9, 10, 11, 12, 14, 15)
  4. Laboratory write-ups, including production of publication-quality research report on a major laboratory experiment. (Objectives: 8, 18, 19)
  5. Worksheets which evaluate the student's mastery of technical concepts such as how DNA is transcribed into mRNA and translated into protein, or how the structure of a biomolecule governs its chemical behaviour. (Objectives: 4, 5, 6, 11, 12, 13, 14, 15)
  6. Written mathematical calculations. (Objectives: 6)
  7. Laboratory practical examinations. (Objectives: 19)

- **SUGGESTED TEXTS OR OTHER INSTRUCTIONAL MATERIALS**

**(List several when possible; include title, author, publisher, date, and latest edition. If older than five years, provide brief rationale.)**

- Alberts, B., et. al. (2010). *Essential Cell Biology* (3rd/e). New York, NY Garland Science.
- Instructor-created Biology 110 Study Packet and Laboratory Manual



ANTELOPE VALLEY COLLEGE

## Academic Affairs Course Outline of Record

- o **COURSE SUBJECT & NUMBER:** BIOL: 102, 102L
- o **COURSE NAME:** \*Human Biology
- o **COURSE UNITS:** 4  
**COURSE HOURS:** Lecture: 3.00 hours weekly / Lab: 3.00 hours weekly; 108 Hours Total
- o **COURSE REQUISITES:** (Follow format of similar courses found in the college catalog.)  
Advisory: Eligibility for ENGL 101 and Eligibility for College Level Reading (CLR) , Eligibility for MATH 070
- o **COURSE DESCRIPTION:** (Write a short paragraph providing an overview of topics covered. Be sure to identify target audience--transfer, major, GE, degree/certificate, etc. If repeatable, state the number of times at end of description as (R#).

This course explores the principles of biology using the human species as its primary tool. It is an introductory level, transfer course designed for non-science majors, students who want to further their professional development, or to enrich their knowledge of biology in general and their bodies in particular. Topics discussed include the scientific method, cell biology, genetics, evolution, aging, major concepts of structure, function and pathology of most organ systems, as well as how humans interact with their internal and external environment. (CSU, UC, AVC)

- o **COURSE OBJECTIVES:** ( Title 5 requires that courses show evidence of critical thinking skills. Use Bloom's taxonomy to formulate concise, performance-based measurable objectives common to all students. Objectives must be closely aligned with course content, assignments, and methods of evaluation)

Upon completion of course, the successful student will be able to

1. Identify, compare and contrast anatomical structures from each of the major body systems.
2. Arrange in proper sequence and explain the steps of basic physiological processes.
3. Formulate and analyze a simple scientific experiment.
4. Look for and evaluate scientific and unscientific evidence.
5. Understand the difference between scientific and unscientific thinking.
6. Logically evaluate current health trends.
7. Describe and assess different sides of current bioethical issues.
8. Use models to be able to name and demonstrate structures within major organ systems.
9. Define appropriate scientific, biological, anatomical, and physiological terms.
10. Explain current thinking about evolution of the primate species HOMO SAPIENS, and place humans taxonomically.
11. Evaluate the design of scientific research projects with emphasis on the hypothesis, methodology, and analysis of data.

- o **COURSE CONTENT:**

### I. Unit 1

A. Topic: Cellular Biology:

B. Subtopics:

1. Introduction to the Human Body and Terminology
2. Scientific Method
3. Basic Chemistry of Biology
4. Cytology
5. Cellular Movement
6. Homeostasis

### II. Unit 2:

A. Topic: Control and Locomotion:

## B. Subtopics:

1. Skeletal System
2. Muscular System
3. Locomotion
4. Nervous System
5. Nervous System and Integration
6. Senses
7. Endocrine System
8. Endocrine System and Integration

## III. Unit 3:

## A. Topic: Oxygen Transport and Delivery

## B. Subtopics:

1. Hematology
2. Anatomy of the Cardiovascular System
3. Physiology of the Cardiovascular System
4. Lymphatic System
5. Immune System
6. Respiratory System
7. Exercise Physiology

## IV. Unit 4:

## A. Topic: Metabolism, Excretion, and Reproduction:

## B. Subtopics:

1. Anatomy of the Digestive System
2. Physiology of the Digestive System
3. Nutrition
4. Urinary System
5. Metabolic Balance
6. Male Reproductive System
7. Female Reproductive System
8. Sexually Transmitted Diseases
9. Human Development
10. Aging

## V. Unit 5:

## A. Topic: Genetics and Evolution:

## B. Subtopics:

1. Chromosomal Inheritance
2. Genes and Genetics
3. DNA
4. Biotechnology and the Human Genome Project
5. Cancer
6. Evolution and HOMO SAPIENS
7. Ecosystems
8. Population Concerns

o **TYPICAL HOMEWORK ASSIGNMENTS: (Do not include in-class work, quizzes, or tests)**

This information is necessary for all credit courses. Assignments should be closely related to course objectives, content, and methods of evaluation. (See sample of a "Model Outline" in the AP&P Standards & Practices Handbook.) Include a range of assignments (minimum of three) from which faculty may choose when designing their syllabus.

1. Describe nature and frequency of typical reading assignments if applicable; note if any are required:

Students will read a minimum of 2 to 3 chapters, covering 30 to 50 pages in the textbook(s) weekly. Additional assignments will include weekly laboratory readings and occasional outside reading for short research reports.

2. Describe nature and frequency of typical writing assignments if applicable; note if any are required:

Students will be required to write 14 weekly laboratory reports, including fill-in, labeling, diagramming, and analyzing test results. In addition, students will be expected to prepare 2 short research reports covering a current health-related, scientific, environmental, or bioethical issue, using appropriate references.

3. Describe nature and frequency of typical **computational** assignments if applicable; note if any are required:

In some laboratory sessions, use of basic arithmetic and algebra calculations will be required. Students will need to multiply, divide, add, subtract, solve fractions, and complete ratios.

4. Describe other types of homework assignments that students may be asked to complete (oral presentations; special projects; visual/performing arts; etc); note if any are required:

Students will present to the class for discussion one of their research reports (see item #2 writing assignments) in lab. The research can be conducted using library resources of journal articles.

For categories 1-4 above, list the estimated hours per week it would take a student to complete assignments. Title 5 (section 55002) requires that each unit must be shown to require three hours of work per week by the student either in or out of class. Homework formula: 3 hours of class work times each unit of credit minus classroom hours equals required homework hours.

Reading Assignments: 6

Writing Assignments: 6

Computational Assignments: 1

Other Assignments: 1

- o **METHODS OF INSTRUCTION:** (Methods must be consistent with content and appropriate to objectives; state in terms of what instructor will be doing in order to present course content to students: for example, lecture, demonstration, present audio/visual materials; facilitate group work, etc. Do not list specific instructional equipment.)
  - o Lab
  - o Lecture
  - o Observation and Demonstration
- o **METHODS OF EVALUATION:** (These must be clearly related to course objectives and reflect course content and assignments in order to comply with Title 5 requirements. Describe what instructor will be looking for when evaluating various assignments and tests in order to determine whether students have met course objectives. Grades must be based on demonstrated proficiency in subject matter and determined, where appropriate, by essays, objective and essay tests, research papers or projects, problem solving exercises, or skills' demonstrations.)
  1. Assessment of multiple choice and written responses for application questions for theories presented in lecture. All examinations and quizzes will be of similar format and may include any of the following: short answer, description, multiple choice, matching true/false, clinical scenarios requiring critical thinking, fill-in-the blank answers in sentences, or matching vocabulary against definition statements. These assessments tie to (Objectives: 1, 2, 4, 5, 6, 7, 10)
  2. Assessment of descriptive responses on lab practical ties to (Objectives: 1, 3, 8, 9)
  3. Evaluation of laboratory reports for accuracy of reported results obtained and analysis of data to demonstrate understanding of concepts presented in the laboratory. This will tie to (Objectives: 1, 3, 8, 9)
  4. Evaluation of written papers, summaries of readings, and oral presentations related to assignments outside of textbook. This will tie to (Objectives: 10, 11)
- o **SUGGESTED TEXTS OR OTHER INSTRUCTIONAL MATERIALS**  
(List several when possible; include title, author, publisher, date, and latest edition. If older than five years, provide brief rationale.)
  - o Michael Johnson (2006). *Human Biology: Concepts and Current Issues* (3rd/e). Pearson Education Publishing.
  - o -. *Laboratory Manual for Human Biology*. Pearson Education Publishing , .





ANTELOPE VALLEY COLLEGE

## Academic Affairs Course Outline of Record

- **COURSE SUBJECT & NUMBER:** BIOL: 101, 101L
- **COURSE NAME:** General Biology
- **COURSE UNITS:** 4
- **COURSE HOURS:** Lecture: 3.00 hours weekly / Lab: 3.00 hours weekly
- **COURSE REQUISITES:** (Follow format of similar courses found in the college catalog.)  
Advisory: Eligibility for College Level Reading (CLR) and Eligibility for ENGL 101
- **COURSE DESCRIPTION:** (Write a short paragraph providing an overview of topics covered. Be sure to identify target audience--transfer, major, GE, degree/certificate, etc. If repeatable, state the number of times at end of description as (R#).

A general education non-major biology course designed to acquaint the students with the nature of science, the unity of life processes, the diversity of living things, the interdependence of organisms in the biosphere. the mechanisms that have shaped life on Earth, and with humans as biological entities. The laboratory focuses on the kinds of living organisms. NOTE: Biology majors should take BIOL 110 and BIOL 120 instead of this course.

- **COURSE OBJECTIVES:** ( Title 5 requires that courses show evidence of critical thinking skills. Use Bloom's taxonomy to formulate concise, performance-based measurable objectives common to all students. Objectives must be closely aligned with course content, assignments, and methods of evaluation)

Upon completion of course, the successful student will be able to

1. Demonstrate an understanding of the nature, applications, and limitations of scientific inquiry.
2. Describe features common to all living things.
3. Recognize and account for differences in organisms based on their structure and function.
4. Recount the taxonomic hierarchy into which all organisms are placed, and describe the general bases upon which the hierarchy is organized; apply these ideas to a variety of taxonomic groups.
5. Describe ecological roles of organisms and provide examples of organisms that exhibit these roles.
6. Understand evolution as a major theme of biology and recount the evidence for biological evolution; describe the central mechanisms of evolution including mutation, altered embryological development, and natural selection.
7. Demonstrate an understanding of DNA as genetic material and the principles of heredity; apply ideas to problems in biotechnology, medicine, and agriculture.
8. Demonstrate knowledge of essential molecular biological mechanisms including photosynthesis, cellular respiration, protein synthesis, and the control of gene expression.
9. Apply biological concepts to the description and solution of problems in the real world.
10. Become familiar with the names and uses of common laboratory equipments, and procedures.
11. Practice the scientific method by conducting laboratory experiments. carrying them to completion, interpreting the results, and writing appropriate reports.
12. Demonstrate an understanding of several major organ systems of the human body; compare human systems with analogous or homologous systems of other organisms.

- **COURSE CONTENT:**

### LECTURE TOPICS

- I. The science of biology
  - A. Introduction to biology
  - B. Characteristics of life
  - C. Levels of classification
  - D. The scientific method

- E. Evolution
- II. The chemistry of life
  - A. The chemical basis of life
  - B. Basic units of life (organic compounds)
- III. Cell structure and function
- IV. Bioenergetics
  - A. Energy and life
  - B. Chemical reactions of life
  - C. Enzyme structure and function
  - D. Cellular respiration: how cells release energy
  - E. Photosynthesis: how cells acquire energy
- V. The cellular basis of reproduction
  - A. Binary fission
  - B. The cell cycle and mitosis
  - C. Meiosis
- VI. The origin and evolution of life
- VII. The diversity of life
  - A. Prokaryotes (bacteria)
  - B. Viruses
  - C. Protista
  - D. Fungi
  - E. Plants
  - F. Animals: invertebrates and vertebrates
- VIII. Foundations of genetics
  - A. Mendelian genetics
  - B. Chromosomes
  - C. Human genetics
- IX. Molecular biology
  - A. DNA Structure
  - B. How genes work (from DNA to proteins)
- X. Biotechnology
- XI. Ecology

#### LABORATORY TOPICS

- I. Observation and Gathering Data
- II. The Microscope
- III. Mitotic Cell Division.
- IV. Prokaryotes: Bacteria and Cyanobacteria
- V. Protists
- VI. Fungi
- VII. Plants
- VIII. Animals
- IX. Enzymes, Photosynthesis, Cellular Respiration
- X. Internal Transport, Gas Exchange
- XI. Excretory and Nervous Systems
- XII. Skeletal, Muscle and Reproductive Systems
- XIII. DNA and Human Genetics
- XIV. Frog Dissection

- **TYPICAL HOMEWORK ASSIGNMENTS: (Do not include in-class work, quizzes, or tests)**

**This information is necessary for all credit courses. Assignments should be closely related to course objectives, content, and methods of evaluation. (See sample of a "Model Outline" in the AP&P Standards & Practices Handbook.) Include a range of assignments (minimum of three) from which faculty may choose when designing their syllabus.**

1. Describe nature and frequency of typical reading assignments if applicable; note if any are required:

Students will read from the textbook, and the lab manual (laboratory exercises), approximately 30 pages each week.

2. Describe nature and frequency of typical writing assignments if applicable; note if any are required:

Written homework assignments, consisting of study questions from selected chapters of the text, or other items as assigned by the instructor, may also be used to fulfill the essay requirement. Students also are required to complete preliminary reports designed to prepare them for the work in lab and quizzes, and lab reports during the lab session.

3. Describe nature and frequency of typical computational assignments if applicable; note if any are required:

N/A

4. Describe other types of homework assignments that students may be asked to complete (oral presentations; special projects; visual/performing arts; etc); note if any are required:

Students may be required to use computer software or course management system to reinforce concepts and skills presented in the lecture and the lab.

For categories 1-4 above, list the estimated hours per week it would take a student to complete assignments. Title 5 (section 55002) requires that each unit must be shown to require three hours of work per week by the student either in or out of class. Homework formula: 3 hours of class work times each unit of credit minus classroom hours equals required homework hours.

Reading Assignments:	<u>3</u>
Writing Assignments:	<u>3</u>
Computational Assignments:	<u>0</u>
Other Assignments:	<u>1</u>

- **METHODS OF INSTRUCTION:** (Methods must be consistent with content and appropriate to objectives; state in terms of what instructor will be doing in order to present course content to students: for example, lecture, demonstration, present audio/visual materials; facilitate group work, etc. Do not list specific instructional equipment.)
  - Experiments
  - Instructor led Discussion
  - Lab
  - Lecture
  - Observation and Demonstration
  - Other: notes projected from multimedia.
- **METHODS OF EVALUATION:** (These must be clearly related to course objectives and reflect course content and assignments in order to comply with Title 5 requirements. Describe what instructor will be looking for when evaluating various assignments and tests in order to determine whether students have met course objectives. Grades must be based on demonstrated proficiency in subject matter and determined, where appropriate, by essays, objective and essay tests, research papers or projects, problem solving exercises, or skills' demonstrations.)
  1. Midterm and final examinations. (Objectives: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12)
  2. Essay items may be included in each test. (Objectives: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12)
  3. Approximate 1/2 of the Lab grade is derived from weekly quizzes covering the principles of the previous week's work, as well as a review of the current week's exercises. (Objectives: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12)
  4. Weekly reports, which include numerous essay questions, are also considered in the determination of this portion of the grade. (Objectives: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12)
  5. 1/4 of the lab grade is derived from each of two lab practical exams, that is, a midterm and a final. (Objectives: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12)
- **SUGGESTED TEXTS OR OTHER INSTRUCTIONAL MATERIALS**  
(List several when possible; include title, author, publisher, date, and latest edition. If older than five years, provide brief rationale.)
  - George B. Johnson (2011). *The Living World* (7th/e). McGraw-Hill.
  - Laboratory Exercises are published by the biology department and made available to students through the bookstore.



ANTELOPE VALLEY COLLEGE

## Academic Affairs Course Outline of Record

- o **COURSE SUBJECT & NUMBER:** BIOL: 100, 100L
- o **COURSE NAME:** Elementary Human Anatomy and Physiology
- o **COURSE UNITS:** 3
- o **COURSE HOURS:** Lecture: 2.00 hours weekly / Lab: 3.00 hours weekly; 90 Hours Total
- o **COURSE REQUISITES:** (Follow format of similar courses found in the college catalog.)  
Advisory: Eligibility for MATH 070 , Eligibility for READ 099 and Eligibility for ENGL 099
- o **COURSE DESCRIPTION:** (Write a short paragraph providing an overview of topics covered. Be sure to identify target audience--transfer, major, GE, degree/certificate, etc. If repeatable, state the number of times at end of description as (R# ).

This course covers the basic structure and function of the human body. Knowledge obtained may be used by students entering either an allied health science or non-transfer level field. (AVC)

- o **COURSE OBJECTIVES:** ( Title 5 requires that courses show evidence of critical thinking skills. Use Bloom's taxonomy to formulate concise, performance-based measurable objectives common to all students. Objectives must be closely aligned with course content, assignments, and methods of evaluation)

**Upon completion of course, the successful student will be able to**

1. Explain the relationship between the structure & function of the human body.
  2. Define and use examples to explain basic anatomical directional terms & body regions.
  3. Identify major body cavities & the organs located in each.
  4. Distinguish between the varying types of tissue and give a primary function for each major category.
  5. Differentiate among the composition and function of the layers of the skin.
  6. Identify the major bones of the skeleton & some of their markings, including whether they belong to the axial or appendicular skeleton.
  7. Identify descriptions of and examples of different types of articulations.
  8. Identify superficial skeletal muscles and list their primary actions.
  9. Identify the major components of the nervous system relative to their function &/or location.
  10. Identify the major components of the eye & the ear.
  11. Identify, describe and give the function of components of the circulatory system.
  12. Explain the importance of blood flow and the effect of cardiac output, blood pressure, blood volume and peripheral resistance on it.
  13. List the components of blood and describe the primary function of each. Explain the components & functions of the lymphatic system.
  14. Identify, describe & give the function of components of the respiratory system.
  15. Describe the steps involved in inhalation & exhalation.
  16. Describe the effect of partial pressures on the exchange of gases.
  17. Identify, describe and give the function & location of components of the digestive system.
  18. List the factors necessary for and pathways taken in the digestion & absorption of foods.
  19. Identify, describe and give the function & location of components of the urinary system.
  20. Describe the formation of urine and the influence of aldosterone and ADH.
  21. Identify, describe & give the function & location of components of the reproductive systems (male & female).
  22. List & describe the major endocrine glands and provide the primary function(s) of each hormone released.
- o **COURSE CONTENT:**
    - I. Unit 1: Body as a Whole

- A. Body Orientation
  - B. Basic Chemistry
  - C. Molecular Transport
  - D. Cellular Structure
  - E. Histology
  - F. Metabolic Processes
  - II. Unit 2: Integument & Skeletomuscular Systems
    - A. Integument
    - B. Skeletal System
    - C. Articulation
    - D. Muscular System
    - E. Neuromuscular Junction & Muscle Properties
  - III. Unit 3: Integration
    - A. Nervous System Cells & Impulse Generation
    - B. Central Nervous System
    - C. Peripheral Nervous System
    - D. Special and General Senses
  - IV. Unit 4: Cardiovascular & Respiratory Systems
    - A. Hematology
    - B. Cardiac Anatomy & Physiology
    - C. Circulation
    - D. Immunology & Lymphatics
    - E. Respiratory System
  - V. Unit 5: Body System Function & Maintenance & Reproduction
    - A. Digestive System
    - B. Urinary System
    - C. Reproductive Systems
    - D. Fertilization & Development
    - E. Endocrine System
- o **TYPICAL HOMEWORK ASSIGNMENTS: (Do not include in-class work, quizzes, or tests)**  
**This information is necessary for all credit courses. Assignments should be closely related to course objectives, content, and methods of evaluation. (See sample of a "Model Outline" in the AP&P Standards & Practices Handbook.) Include a range of assignments (minimum of three) from which faculty may choose when designing their syllabus.**
1. **Describe nature and frequency of typical reading assignments if applicable; note if any are required:**
    - Lab syllabus -- Weekly reading of the lab activities and introductory information.
    - Lecture Textbook -- Four to five times weekly to further understand material covered in lecture. Each lecture topic is assigned a chapter or a portion of a chapter.
  2. **Describe nature and frequency of typical writing assignments if applicable; note if any are required:**
    - Assigned homework questions and portions of the lab reports require written responses to be completed at home.
    - 4X / semester -- Practice answering short answer and essay type questions to prepare for lecture exams.
  3. **Describe nature and frequency of typical computational assignments if applicable; note if any are required:**
    - 1X / semester -- Computation of averages (urine vol. and chloride content).
  4. **Describe other types of homework assignments that students may be asked to complete (oral presentations; special projects; visual/performing arts; etc); note if any are required:**
    - Use of the computer to locate & utilize study tools available on the Internet along with the lecture textbook DVD.

For categories 1-4 above, list the estimated hours per week it would take a student to complete assignments. Title 5 (section 55002) requires that each unit must be shown to require three hours of work per week by the student either in or out of class. Homework formula: 3 hours of class work times each unit of credit minus classroom hours equals required homework hours.

<b>Reading Assignments:</b>	<u>3</u>
<b>Writing Assignments:</b>	<u>2.5</u>
<b>Computational Assignments:</b>	<u>0.25</u>
<b>Other Assignments:</b>	<u>0.5</u>

- o **METHODS OF INSTRUCTION:** (Methods must be consistent with content and appropriate to objectives; state in terms of what instructor will be doing in order to present course content to students: for example, lecture, demonstration, present audio/visual materials; facilitate group work, etc. Do not list specific instructional equipment.)
  - o Experiments
  - o Individualized Instruction
  - o Instructor led Discussion
  - o Lab
  - o Lecture
  - o Observation and Demonstration
  - o Other: 1. Use of multimedia presentations with animations. 2. Laboratory exercises stress identification of anatomical structure and/or illustration of physiological principles presented in lecture.
- o **METHODS OF EVALUATION:** (These must be clearly related to course objectives and reflect course content and assignments in order to comply with Title 5 requirements. Describe what instructor will be looking for when evaluating various assignments and tests in order to determine whether students have met course objectives. Grades must be based on demonstrated proficiency in subject matter and determined, where appropriate, by essays, objective and essay tests, research papers or projects, problem solving exercises, or skills' demonstrations.)
  1. Weekly lab reports covering lab work and related lecture material. Each lab report includes information collected during the lab and assignment/questions to be completed outside of class time. (Objectives: 1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 18, 19, 20, 21)
  2. Four lecture exams covering specified material (Units 1-4) and a final exam covering the remaining lecture material. Each exam includes multiple choice, true/false, a section of short answer identification and a section of short essay description questions. (Objectives: 1, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22)
  3. Two lab practical exams composed of recall questions requiring identification of models and specimen. (Objectives: 1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 18, 19, 20, 21)
- o **SUGGESTED TEXTS OR OTHER INSTRUCTIONAL MATERIALS**  
(List several when possible; include title, author, publisher, date, and latest edition. If older than five years, provide brief rationale.)
  - o Marieb, E.N., Hoehn, K. (2010). *Human Anatomy & Physiology* (8th/e). Benjamin Cummings.
  - o Smith, D.G., Schenk, M.P.. Dissection Guide and Atlas to the Fetal Pig. Morton Publishing Company



ANTELOPE VALLEY COLLEGE

## Academic Affairs Course Outline of Record

Approval Dates  
COR: 03/14/2013  
SLO: 02/25/2013

- **COURSE SUBJECT & NUMBER:** ANTH 101L
- **COURSE NAME:** Physical Anthropology Laboratory
- **COURSE UNITS:** 1
- **COURSE HOURS:** Lab: 3.00 hours weekly (54 Hours Total)
- **COURSE REQUISITES: (Follow format of similar courses found in the college catalog.)**

Corequisite: Concurrent enrollment in ANTH 101 or prior completion ,

Advisory: Eligibility for ENGL 099 , Eligibility for ENGL 101

- **COURSE DESCRIPTION: (Write a short paragraph providing an overview of topics covered. Be sure to identify target audience—transfer, major, GE, degree/certificate, etc. If repeatable, state the number of times at end of description as (R# ).**

This is an introductory laboratory course that investigates human evolution and human biological diversity from a scientific perspective. This includes human genetics, principles of natural selection, physical and behavioral characteristics of primates, fossil evidence of human evolutionary change, and modern human variation. The course is designed for students who study anthropology, biology, ethnic studies and all other disciplines. A field trip may be required. (CSU, UC, AVC)

- **COURSE OBJECTIVES: ( Title 5 requires that courses show evidence of critical thinking skills. Use Bloom's taxonomy to formulate concise, performance-based measurable objectives common to all students. Objectives must be closely aligned with course content, assignments, and methods of evaluation)**

Upon completion of course, the successful student will be able to

1. Explain the scientific method and how Anthropologists use it in the field and laboratory.
2. Explain the major mechanisms of evolution and their impact on human evolution.
3. Demonstrate the role of DNA within an organism.
4. Demonstrate Mendelian inheritance principles.
5. Demonstrate an understanding and an ability to utilize proper laboratory techniques in order to interpret evolutionary trends resulting in the hominin phylogeny.
6. Recognize, manipulate, and measure primate taxa and fossil evidence such as hominin skulls and dentition.
7. Identify anatomical differences in various primate taxa, especially hominins.
8. Identify parts and characteristics of the primate taxa, hominins, and human skeletons, and apply to the use of anthropometry.
9. Explain the functions of forensic anthropology.

- **COURSE CONTENT:**

### I. Scientific Method

### II. Human Skeleton

- A. Identification of the bones
- B. Identification of bone features
- C. Basic Anthropometry/osteometry
- D. Human growth and development

### III. Genetics

- A. DNA and the Cell
- B. Mitosis and Meiosis
- C. Mendelian Inheritance
- D. Pedigree Analysis

- IV. Mechanisms of Evolution
  - A. Hardy-Weinberg Analysis
  - B. Effects of Natural Selection, Mutation, Genetic Drift and Gene Flow on humans
- V. Biological Classifications
  - A. Comparison of phylogenetic methodologies
  - B. Definition of species and other taxonomic units
- VI. Living Primates
  - A. Comparative anatomy of Primates
  - B. Analysis of primate locomotion patterns
  - C. Comparison of living primate behavior
  - D. Evaluation of Primate fossil record
- VII. Hominin Fossil Record
  - A. What is a fossil?
  - B. Examination of early hominin fossils (pre genus Homo)
  - C. Examination of recent hominin fossils (genus Homo)
- VIII. Modern Human Variation
  - A. Evolutionary explanations for human biological diversity
  - B. Analysis of human skeletal pathologies and anomalies
  - C. An anthropological view of "race".
- IX. The use of Forensic Anthropology
  - A. Determination of Sex, Age, Ancestry, and Stature
  - B. Examination of Antemortem and Perimortem trauma and Postmortem damage.

◦ **TYPICAL HOMEWORK ASSIGNMENTS: (Do not include in-class work, quizzes, or tests)**

**This information is necessary for all credit courses. Assignments should be closely related to course objectives, content, and methods of evaluation. (See sample of a "Model Outline" in the AP&P Standards & Practices Handbook.) Include a range of assignments (minimum of three) from which faculty may choose when designing their syllabus.**

**1. Describe nature and frequency of typical reading assignments if applicable; note if any are required:**

Students will read from textbooks and handouts, approximately 25 to 35 pages each week.

Additional assignments will include weekly laboratory readings and supplemental material such as internet based articles, journal articles, and/or websites as assigned by the instructor.

**2. Describe nature and frequency of typical writing assignments if applicable; note if any are required:**

Writing assignments might include, but are not limited to, lab reports, response/reaction papers, article reviews, and research papers.

**3. Describe nature and frequency of typical computational assignments if applicable; note if any are required:**

Laboratory sessions may require the use of basic arithmetic and algebra calculations will be required. Students will need to multiply, divide, add, subtract, solve fractions, and complete ratios.

**4. Describe other types of homework assignments that students may be asked to complete (oral presentations; special projects; visual/performing arts; etc); note if any are required:**

N/A

**For categories 1-4 above, list the estimated hours per week it would take a student to complete assignments. Title 5 (section 55002) requires that each unit must be shown to require three hours of work per week by the student either in or out of class. Homework formula: 3 hours of class work times each unit of credit minus classroom hours equals required homework hours.**

Reading Assignments: 2  
 Writing Assignments: 2  
 Computational Assignments: 0.5  
 Other Assignments: 0

◦ **METHODS OF INSTRUCTION: (Methods must be consistent with content and appropriate to objectives; state in terms of what instructor will be doing in order to present course content to students: for example, lecture, demonstration, present audio/visual materials; facilitate group work, etc. Do not list specific instructional equipment.)**

- Experiments
- Individualized Instruction



- Instructor led Discussion
- Instructor led Problem Solving
- Lab
- Lecture
- Observation and Demonstration
- Projects
- Visiting Lecturers
- Other: Group exercises and use of skeletal and reproduction fossil collections.
- **METHODS OF EVALUATION: (These must be clearly related to course objectives and reflect course content and assignments in order to comply with Title 5 requirements. Describe what instructor will be looking for when evaluating various assignments and tests in order to determine whether students have met course objectives. Grades must be based on demonstrated proficiency in subject matter and determined, where appropriate, by essays, objective and essay tests, research papers or projects, problem solving exercises, or skills' demonstrations.)**
  1. Students will be evaluated through lab quizzes and exams containing both objective and essay questions. (Objectives: 1, 2, 3, 4, 5, 6, 7, 8, 9)
  2. Students will be evaluated through hands-on practical exams requiring identification of models and specimens. (Objectives: 3, 5, 6, 7, 8)
  3. Students will be evaluated through written assignments related to the major topics. (Objectives: 2, 3, 4, 5, 6, 7, 8, 9)
  4. Students will be evaluated on laboratory exercises and problems to determine students' ability to apply anthropological techniques. (Objectives: 1, 3, 4, 5, 6, 7, 8, 9)
- **SUGGESTED TEXTS OR OTHER INSTRUCTIONAL MATERIALS**  
**(List several when possible; include title, author, publisher, date, and latest edition. If older than five years, provide brief rationale.)**
  - France, Diane L. (2010). *Lab Manual and Workbook for Physical Anthropology* (7th/e). Wadsworth Publishing.
  - Angeloni, Elvio, editor (2012). *Annual Editions: Physical Anthropology* (2012-2013/e). McGraw-Hill/Dushkin.
  - Zillman, Adrienne (2001). *The Human Evolution Coloring Book* (2nd/e). Harper Collins. Rationale: This is the only book of its kind.
  - Erhart, Beth (2008). *Physical Anthropology Lab Book* Kendall Hunt .