THE EXERCISE BIOLOGY MAJOR

IN 1958, the Exercise Biology program began as an academic major in Physical Education in the Physical Education Department. An addition to Hickey Gym completed in 1964 included a research and teaching laboratory complex, the Human Performance Laboratory, the first such space designed for the purposes of conducting research in physical education and exercise science in the UC system. The laboratory's academic focus and technical development were predominantly in the areas of exercise physiology and biomechanics, with some work in the newly developing area of sport psychology. The research emphasis was on humans rather than the animal models commonly utilized in most other research labs on the Davis campus.

In 1988 with the introduction of a B.S. degree and academic tracks in physiology, biomechanics and clinical exercise. This eventually led to a change in the name of the department and major to Exercise Science. In 1999, the Exercise Science academic program was separated from the Physical Education activity program, which eventually became a part of the Division of Social Sciences. The Exercise Science major was reorganized into a form consistent with other majors in the Division of Biological Sciences (DBS), now the College of Biological Sciences (CBS). In 2000 the program was officially transferred to DBS, with the revised major renamed Exercise Biology. In 2005 the Exercise Biology program and associated faculty were merged into the Department of Neurobiology, Physiology and Behavior in CBS.
IN 1993, the reorganization of the Division of Biological Sciences was completed. Faculty from several different campus units, including Animal Physiology, Animal Science, Biochemistry, Chemistry, Psychology, and Zoology joined together to form the Section of Neurobiology, Physiology, and Behavior (NPB). The Physiology major, with its emphasis on cellular, systemic, comparative and environmental physiology, expanded to include neurobiology and behavior. To reflect the integration of the three sub-disciplines, effective fall 1996, the major changed its name to NPB. Human as well as other animal systems are examined.

The NPB major is designed to provide students with an understanding of vital functions common to all animals -- growth, reproduction, movement, response to stimuli, and maintenance of homeostasis. The physiological mechanisms upon which these functions depend are precisely regulated and highly integrated. An organism's behavior is determined by the coordinated actions of all physiological systems within the organism's physical and social environments. Students in this major will study functional mechanisms, as well as the control, regulation, integration, and behavior that relate to these mechanisms at the level of the cell, organ system, and organism.

The major provides the foundations for a challenging career. It serves as a basis for further training in schools of human and veterinary medicine, medical technology, physical therapy, pharmacy, dentistry, optometry, and other health sciences. The major also provides the scientific foundation for employment in health care, pharmaceutical and biotechnology industries. Students interested in high school teaching, college level teaching, or research may use the program as preparation for advanced degrees.
DECLARING THE
EXERCISE BIOLOGY MAJOR

Students may be admitted to the University of California, Davis in the Exercise Biology (EXB) major if they indicate it on their applications. However, enrolled students who wish to change their major to EXB will have to file a Change of Major form.

INSTRUCTIONS FOR CHANGING THE MAJOR:

• Make a preliminary study plan listing all the necessary courses for obtaining a B.S. or A.B. in EXB.
  
  o **Freshman and Sophomores**: design a 2-year program that focuses on the preparatory courses and provides opportunities for a breadth of educational experiences.
  
  o **Juniors and Seniors**: design a 2-year study plan that focuses on the Upper Division core courses and the required Depth Subject Matter and provides time to pursue research and/or internship opportunities.
  
• If you are having difficulty selecting courses and creating a study plan, visit the EXB Advising Office in 188 Briggs and talk with the EXB Peer Advisor.

• If you are planning to attend a health professional school, visit the Health Sciences Advising (HSA) office in South Hall for information on health professional school requirements.

• Stop by during drop in advising hours in 188 Briggs to see Dianna Smith, the Academic Advisor, or see the EXB Master Advisor, by appointment, to review your study plan and have your Change of Major form signed.

Your study plan is **not a contract**.

It may and most likely will change as you develop your interests.

We encourage all students to explore and find the program that works best for them.
Declaring the Neurobiology, Physiology, & Behavior Major

Students may be admitted to the University of California, Davis in the Neurobiology, Physiology, and Behavior (NPB) major if they indicate it on their applications. However, enrolled students who wish to change their major to NPB will have to file a Change of Major form.

**INSTRUCTIONS FOR DECLARING THE MAJOR:**

- Make a preliminary study plan listing all the necessary courses for obtaining a B.S. in NPB.
  - **Freshman and Sophomores:** design a 2-year program that focuses on the preparatory courses and provides opportunities for a breadth of educational experiences.
  - **Juniors and Seniors:** after completion of NPB 100 or 101 or 102, design a 2 year study plan that focuses on the required Depth Subject Matter and provides time to pursue research and/or internship opportunities.

- If you are having difficulty selecting courses and creating a study plan, visit the NPB Advising Office in 188 Briggs and talk with the NPB Peer Advisor.

- If you are planning to attend a health professional school, visit the Health Sciences Advising (HSA) office in South Hall for information on health professional school requirements.

- Make an appointment in 188 Briggs to see Dr. Will DeBello, the Master Advisor, or Debbie Abbott-Poarch, the Academic Advisor, to review your study plan and have your Change of Major form signed.

Your study plan is **not a contract**.

It may and most likely will change as you develop your interests.

We encourage all students to explore and find the program that works best for them.
Academic Advisors are valuable resources for all students. Students majoring in Exercise Biology (EXB) or Neurobiology, Physiology, & Behavior (NPB) may receive help from the Peer Advisor, Academic Advisor, and/or Master Advisor.

**Peer Advisor:**

The EXB and NPB Peer Advisors will provide a student’s perspective on specific courses and study plans in addition to offering valuable current information about the EXB and NPB majors, internships, and application to post-graduate schools. The Peer Advisors are located in 188 Briggs and hold office hours each week. Drop by, call the EXB and NPB Advising Services (754-9406), or visit the website (www.npb.ucdavis.edu) for their current office hours.

**Academic Advisor:**

Dianna Smith, the EXB Academic Advisor and Debbie Abbott-Poarch, the NPB Academic Advisor, will help with academic and non-academic problems that include tailoring your program to meet your needs and career aspirations, changing your major, performing degree checks, and providing major certifications. Dianna and Debbie can provide information on petitions and administrative procedures, scholarships and aid, honor societies, activities and clubs, and career options. In addition, they can direct you to campus service units for help with specific problems. (Dianna (dbsmith@ucdavis.edu) and Debbie (dsabbott@ucdavis.edu) are located in 188 Briggs. Check npb.ucdavis.edu web site for current advising hours.

**Faculty Advisor:**

All faculty members in the Department of NPB are faculty advisors. While you are not assigned a faculty advisor, you are encouraged to see a faculty advisor with specific subject area expertise concerning course options for postgraduate programs and research opportunities. E-mail or phone any faculty member with whom you wish to schedule an appointment (see page 24). However, you are strongly encouraged to meet with the EXB Master Advisor or Dr. Will DeBello, the NPB Master Advisor, or Debbie Abbott-Poarch or Dianna Smith for planning strategies to ensure your academic success.
PLANNING YOUR PROGRAM FOR THE A.B. IN EXERCISE BIOLOGY

Students majoring in the Bachelor of Arts in Exercise Biology (EXB) must fulfill the general college and university requirements in addition to two categories of specific major requirements. The major requirements include:

- **Preparatory Subject Matter**
  - One year of lower division courses in biology
  - Two quarters of general chemistry
  - Two quarters of physics
  - One course in psychology
  - One course in statistics

- **Depth Subject Matter**
  - Upper Division Core
    - EXB 101 Exercise Physiology
    - EXB 102 Motor Learning & The Psychology of Sport & Exercise
    - EXB 103 Analysis & Control of Human Movement
    - EXB 104L Exercise Biology Laboratory
    - EXB 106, 106L Human Anatomy, Lab
    - BIS 101 Genes and Gene Expression
    - NPB 101 Systemic Physiology
  - Areas of Emphasis

  EXB students are required to complete one additional EXB course (not including P/NP courses). Students also must select one additional course from two of the three areas listed below:

  Sociology & Culture:  AAS 100; ANT 101; CMN 165; CRD 176; EXB 120; HIS 178B; SAS 105, 120; STS 150; SOC 122, 154, 159, 172

  History & Philosophy:  DRA 141; HIS 135A, 135B, 136, 139A, 139B, 185A; PHI 108; STS 130A, 130B, 131

  Psychology & Communication:  ARE 112; CMN 134, 136; ESP 126; EXB 121, 122; HDE 100C; PSC 101, 121, 126, 140

The College of Biological Sciences has additional requirements for students completing the AB degree (15 unit level proficiency in a foreign language, completion of a mini minor, minor, or double major). Students should meet with an advisor in the College to go over the additional requirements.
PLANNING YOUR PROGRAM FOR THE
B.S. IN EXERCISE BIOLOGY

Students majoring in the Bachelor of Science in Exercise Biology (EXB) must fulfill the general college and university requirements in addition to two categories of specific major requirements. The major requirements include:

- **Preparatory Subject Matter**
  - One year each of lower division courses in biology, general chemistry, organic chemistry, physics, & mathematics

- **Depth Subject Matter**
  - College of Biological Sciences Common Upper Division Curriculum
    - BIS 101  Genes and Gene Expression
    - BIS 102 & 103 or  Biochemistry
    - BIS 105  Biomolecules and Metabolism
    - BIS 104  Regulation of Cell Function
  - Upper Division Core
    - EXB 101  Exercise Physiology
    - EXB 102  Motor Learning & The Psychology of Sport & Exercise
    - EXB 103  Analysis & Control of Human Movement
    - EXB 104L  Exercise Biology Laboratory
    - EXB 106, 106L  Human Anatomy, Lab
    - NPB 101  Systemic Physiology
    - STA 100 or 102  Applied Statistics
  - Areas of Emphasis
    - EXB students are required to complete three courses for their depth of subject matter:
      - 1 course from Group A (3-4 units)
      - 1 additional course from Group A or Group B (3-4 units)
      - 1 additional course from Groups A, B or C (3-4 units)

**Group A:** EXB 111 (3; II), 112 (4; II), 115 (3; I), 126 (3; II)
**Group B:** EXB 110 (3; III), 113 (3; ), 117 (3; III), 124 (4; II),125 (3), 179 (3), or from Group A
**Group C:** EXB 122 (3; III); EAD 115 (4; I, II, III); ENG 102 (4; I, II, III); NPB 112 (3; ), 113 (4; I), 140 (3; II); NUT 111AV (3; III) or from Group A or B.
PLANNING YOUR NPB PROGRAM

Students majoring in Neurobiology, Physiology, & Behavior (NPB) must fulfill the general college and university requirements in addition to two categories of specific major requirements. The major requirements include:

- **Preparatory Subject Matter**
  - One year each of lower division courses in biology, general chemistry, organic chemistry, physics, & mathematics
  - One course in statistics

- **Depth Subject Matter**
  - College of Biological Sciences Common Upper Division Curriculum
    - BIS 101: Genes and Gene Expression
    - BIS 102 & 103 or BIS 105: Biochemistry
    - BIS 104: Biomolecules and Metabolism
    - BIS 104: Regulation of Cell Function
  - Core Courses in NPB
    - NPB 100: Neurobiology
    - NPB 101: Systemic Physiology
    - NPB 101L: Systemic Physiology Laboratory
    - NPB 102: Animal Behavior
    - NPB 104L or 106: Cellular Physio/Neurobiology Laboratory or Experiments in NPB
      or 111L or 160L or Advanced Systemic Physiology Laboratory or Advanced
      or 194HC: Cellular Neurobiology Laboratory or NPB Honors
    - STA 100 or 102: Statistics

  Note: NPB 100 is not open for credit to students who have completed NPB 112, 160, 161, 162 or NSC 221, 222.
  NPB 101L, 104L, 111L, and 160L involve animal experiments.

- NPB Upper Division Depth Units
  NPB majors are required to take **12 additional units** of upper division NPB courses. This requirement may be met by any upper division NPB course not used to satisfy another NPB major requirement.
  In addition, **ANT 154A, B; ENT 104; EXB 101, 102, 111, 125** may also be used to fulfill the Upper Division Depth Unit requirement.

  Note: NPB 192, 197T, and 199 may not be used to satisfy the NPB Upper Division Depth Unit requirement.

- Evolution Requirement: One course in evolution: ANT 151, Primate Evolution; EVE 100, Introduction to Evolution, or GEL 107, Paleobiology.
**PLANNING YOUR PROGRAM**

Students are required to design a study plan detailing how they intend to fulfill the major requirements. You should plan your program by noting all of your requirements (major, college, university). Be sure to schedule your courses in the appropriate quarters as **not all courses are offered every quarter or academic year** and upper division courses have different prerequisites (see page 7 and verify by checking the NPB web site, npb.ucdavis.edu).

**HINTS FOR DESIGNING A STUDY PLAN**

- While **fifteen (15) units per quarter** is the expected workload, you should adjust your quarterly load based on course aptitude, work schedule, internships, research, and other nonacademic responsibilities. You must complete at least **39 units per academic year**.

- Strive to take two to three required lower division courses each quarter until you finish the lower division requirements. This will enable you to spend your junior and senior years taking upper division courses.

- Explore lower-division EXB or NPB Courses to see if the major is a good fit for you (consult chart below).

- **Balance science with non-science courses.** Most students enjoy the greatest academic success by taking two science courses with two non-science GE or breadth courses (see page 12 for Breadth requirements).

- Evenly distribute your required upper division science courses. Take only two or three of these courses each quarter to provide time to explore your academic and professional interests.

<table>
<thead>
<tr>
<th>Lower-Division Courses</th>
<th>Units</th>
<th>Quarters Offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXB 10 Exercise &amp; Fitness: Principles &amp; Practice</td>
<td>3</td>
<td>Fall Winter</td>
</tr>
<tr>
<td>NPB 10 Elementary Human Physiology</td>
<td>4</td>
<td>Winter SS</td>
</tr>
<tr>
<td>NPB 12 Human Nervous System</td>
<td>3</td>
<td>Fall</td>
</tr>
<tr>
<td>NPB 14 Illusions and the Brain</td>
<td>3</td>
<td>Winter</td>
</tr>
<tr>
<td>*NPB 15 Physiology of Human Aging</td>
<td>3</td>
<td>Fall</td>
</tr>
<tr>
<td>*NPB 68 Physiology of Addictive Drugs</td>
<td>3</td>
<td>Spring</td>
</tr>
<tr>
<td>*NPB 90A Body Weight Regulation</td>
<td>2</td>
<td>Winter</td>
</tr>
<tr>
<td>*NPB 90B Color Perception</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>NPB 90C Issues in Animal Behavior</td>
<td>2</td>
<td>Spring</td>
</tr>
<tr>
<td>*NPB 90D Issues in Reproductive Endocrinology</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>*NPB 90E Biology of Aging</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>* NPB 90F Visual Impairment and Blindness</td>
<td>2</td>
<td>Fall</td>
</tr>
</tbody>
</table>

* Denotes a course will not be offered.
### Upper Division EXB Courses Offered

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
<th>Quarters Offered</th>
<th>Prerequisite Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercise Physiology</td>
<td>4</td>
<td>Fall, Spring</td>
<td>NPB 101</td>
</tr>
<tr>
<td>Intro to Motor Learning</td>
<td>4</td>
<td>Fall, Winter</td>
<td>PSC 1 highly recommended</td>
</tr>
<tr>
<td>Analysis of Movement</td>
<td>4</td>
<td>Spring</td>
<td>PHY 7AB; CHA 101, 101L</td>
</tr>
<tr>
<td>Exercise Biology Laboratory</td>
<td>3</td>
<td>Fall, Spring</td>
<td>EXB 101, 102, 103 (last can be concurrent)</td>
</tr>
<tr>
<td>Exercise Metabolism</td>
<td>3</td>
<td>Fall, Spring</td>
<td>EXB 101</td>
</tr>
<tr>
<td>Environ Effects on Phys Perf</td>
<td>3</td>
<td>Winter</td>
<td>EXB 101 or COI</td>
</tr>
<tr>
<td>Clinical Exercise Physiology</td>
<td>4</td>
<td>Winter</td>
<td>EXB 101 or COI</td>
</tr>
<tr>
<td>Growth &amp; Development</td>
<td>3</td>
<td></td>
<td>CHA 101, 101L; NPB 101</td>
</tr>
<tr>
<td>Biomech Basis of Movement</td>
<td>3</td>
<td>Fall</td>
<td>EXB 103 or COI</td>
</tr>
<tr>
<td>Nutrition for Phys Active</td>
<td>3</td>
<td></td>
<td>NPB 101</td>
</tr>
<tr>
<td>Exercise &amp; Aging</td>
<td>3</td>
<td>Spring</td>
<td>EXB 101 or 113 (concurrently)</td>
</tr>
<tr>
<td>Sports in American Society</td>
<td>3</td>
<td>Check</td>
<td>EXB 102</td>
</tr>
<tr>
<td>Sport Psychology</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psych Effects of Phys Activity</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physio of Max Human Perf.</td>
<td>4</td>
<td>Winter</td>
<td>PSC 1; UD standing</td>
</tr>
<tr>
<td>Neuromuscular &amp; Behavioral</td>
<td>3</td>
<td></td>
<td>EXB 101</td>
</tr>
<tr>
<td>Tissue Mechanics</td>
<td>3</td>
<td>Winter</td>
<td>EXB 103 or ENG 45 or COI</td>
</tr>
<tr>
<td>Theory &amp; Pract of Exer Test</td>
<td>1</td>
<td></td>
<td>EXB 101, 112 (or concurrent); current CPR</td>
</tr>
<tr>
<td>Adult Fitness Testing Lab</td>
<td>1</td>
<td></td>
<td>EXB 148 (concurrently); current CPR</td>
</tr>
<tr>
<td>Frontiers in Exercise Biology</td>
<td>3</td>
<td>Every fourth</td>
<td>EXB 101, 102, 103 (or concurrently) 104L rec.</td>
</tr>
</tbody>
</table>

* Denotes a course not currently offered
## Upper Division NPB Courses Offered

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
<th>Quarters Offered</th>
<th>Prerequisite Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 Neurobiology</td>
<td>4</td>
<td>Fall Winter Spring</td>
<td>BIS 2ABC. PHY 7ABC</td>
</tr>
<tr>
<td>100L Neurobiology Laboratory</td>
<td>3</td>
<td>Fall</td>
<td>NPB 100 (may be taken concurrently)</td>
</tr>
<tr>
<td>*100Q Quantitative Neurobiology</td>
<td>1</td>
<td>Fall</td>
<td>NPB 100 (maybe completed concurrently)</td>
</tr>
<tr>
<td>101 Systemic Physiology</td>
<td>5</td>
<td>Fall Winter Spring</td>
<td>BIS 2A. CHE 2B (PHY or 7C recommended)</td>
</tr>
<tr>
<td>101L Systemic Physiology Lab</td>
<td>3</td>
<td>Fall Winter Spring</td>
<td>NPB 101</td>
</tr>
<tr>
<td>102 Animal Behavior</td>
<td>3</td>
<td>Fall Winter Spring</td>
<td>BIS 2ABC. NPB 101</td>
</tr>
<tr>
<td>*103 Cellular Physiology/Neurobiology</td>
<td>3</td>
<td></td>
<td>BIS 103, 104. (PHY 7C recommended)</td>
</tr>
<tr>
<td>*104L Cell Physiology/Neurobiology Lab</td>
<td>4</td>
<td></td>
<td>NPB 101 and 101L. BIS 103 or 105.</td>
</tr>
<tr>
<td><strong>105</strong> Intro to Computer Models</td>
<td>4</td>
<td>Fall Winter Spring</td>
<td>MATH16C. PHY17C. CHE2C. NPB100 or 101</td>
</tr>
<tr>
<td>106 Experiments in NPB</td>
<td>3</td>
<td>Fall Winter Spring</td>
<td>NPB 100, 101, 102, and 199</td>
</tr>
<tr>
<td>*107 Cell signaling in Health and Disease</td>
<td>3</td>
<td></td>
<td>BIS 102 or 105</td>
</tr>
<tr>
<td>111L Advanced Physiology Lab</td>
<td>4</td>
<td>Winter</td>
<td>NPB 101, 101L</td>
</tr>
<tr>
<td>*112 Neuroscience</td>
<td>3</td>
<td></td>
<td>NPB 100 or 101</td>
</tr>
<tr>
<td>113 Cardio, Respiratory, Renal</td>
<td>4</td>
<td>Fall</td>
<td>NPB 101. CHE 8B. (PHY 7BC rec.)</td>
</tr>
<tr>
<td>114 Gastrointestinal Physiology</td>
<td>3</td>
<td>Fall</td>
<td>NPB 101. (BIS 103 or 105 recommended)</td>
</tr>
<tr>
<td>117 Avian Physiology</td>
<td>3</td>
<td>Winter Spring</td>
<td>BIS 2A, 2B. CHE 2B. NPB 101</td>
</tr>
<tr>
<td>121 Physiology of Reproduction</td>
<td>4</td>
<td>Winter</td>
<td>NPB 101</td>
</tr>
<tr>
<td>121L Physio of Reproduction Lab</td>
<td>1</td>
<td>Winter</td>
<td>(NPB 121 recommended. Can be concurrent)</td>
</tr>
<tr>
<td>*122 Developmental Endocrinology</td>
<td>3</td>
<td></td>
<td>NPB 101</td>
</tr>
<tr>
<td>123 Comp. Vertebrate Organology</td>
<td>4</td>
<td>Winter</td>
<td>BIS 2AB</td>
</tr>
<tr>
<td>124 Comparative Neuroanatomy</td>
<td>4</td>
<td>Winter</td>
<td>PSC 101 or NPB 100 or 101</td>
</tr>
<tr>
<td>*125 Neurointegrative Mechanisms</td>
<td>3</td>
<td></td>
<td>NPB 101</td>
</tr>
<tr>
<td>*126 Comp. Sensory Systems</td>
<td>3</td>
<td></td>
<td>NPB 100 or 101</td>
</tr>
<tr>
<td>*127 Comp. Circulation</td>
<td>3</td>
<td></td>
<td>NPB 101</td>
</tr>
<tr>
<td>128 Comp. Endocrinology</td>
<td>3</td>
<td>Summer</td>
<td>NPB 101</td>
</tr>
<tr>
<td>*129 Comp. Respiration</td>
<td>3</td>
<td></td>
<td>NPB 101</td>
</tr>
<tr>
<td>130 Physio of Endocrine Glands</td>
<td>4</td>
<td>Fall</td>
<td>NPB 101</td>
</tr>
<tr>
<td>132 Genes Nutrients Health</td>
<td>3</td>
<td>Fall</td>
<td>BIS 1A or 2A</td>
</tr>
<tr>
<td>139 Frontiers in Physiology</td>
<td>3</td>
<td>Fall</td>
<td>NPB 100, 101, (102 can be concurrent)</td>
</tr>
<tr>
<td>140 Environmental Physiology</td>
<td>3</td>
<td>Winter</td>
<td>NPB 101. (BIS 102 recommended)</td>
</tr>
<tr>
<td>141 Physio Adaptations of Marine</td>
<td>3</td>
<td>Winter Spring</td>
<td>Upper division standing. Residence at BML</td>
</tr>
<tr>
<td>141P Advanced Topics in NPB 141</td>
<td>5</td>
<td>Winter Spring</td>
<td>NPB 141 concurrently. Residence at BML</td>
</tr>
<tr>
<td>150 Advanced Animal Behavior</td>
<td>4</td>
<td>Winter</td>
<td>NPB 102 or PSC 101</td>
</tr>
<tr>
<td>152 Hormones and Behavior</td>
<td>3</td>
<td>Spring</td>
<td>NPB 101. NPB 102 or PSC 101</td>
</tr>
<tr>
<td>*159 Frontiers in Behavior</td>
<td>3</td>
<td>Every fourth Spring</td>
<td>NPB 100, 101. 102.</td>
</tr>
<tr>
<td>*160 Molec. and Cell Neurobiology</td>
<td>3</td>
<td>Every other Spring</td>
<td>NPB 100. BIS 101 and consent of instructor</td>
</tr>
<tr>
<td>*160L Advanced Cell Neurobio Lab</td>
<td>4</td>
<td></td>
<td>NPB 160. (PHY 7C recommended)</td>
</tr>
<tr>
<td>161 Developmental Neurobiology</td>
<td>3</td>
<td>Winter</td>
<td>NPB 100 or 101</td>
</tr>
<tr>
<td>162 Neural Mech. of Behavior</td>
<td>3</td>
<td>Spring</td>
<td>NPB 100 or 101</td>
</tr>
<tr>
<td>164 Mammalian Vision</td>
<td>4</td>
<td>Winter</td>
<td>NPB 100, 112, or PSC 101</td>
</tr>
<tr>
<td>*165 Neurobio. of Speech</td>
<td>3</td>
<td></td>
<td>NPB 100 or 101</td>
</tr>
<tr>
<td>*166 Math Tools for Neuroscience</td>
<td>4</td>
<td></td>
<td>NPB 100 or per. of instructor. MAT 16C. PHY 7C</td>
</tr>
<tr>
<td>*167 Computational Neuroscience</td>
<td>5</td>
<td></td>
<td>NPB 100 or per. of instructor. MAT 16C. PHY 7C</td>
</tr>
<tr>
<td>168 Neurobio. of Addictive Drugs</td>
<td>4</td>
<td>Spring</td>
<td>NPB 100 or 101</td>
</tr>
<tr>
<td>*169 Frontiers in Neurobiology</td>
<td>3</td>
<td>Every fourth Spring</td>
<td>NPB 100, 101, (NPB 102 can be concurrent)</td>
</tr>
</tbody>
</table>

* denotes a course not currently offered  
Note: Check with NPB Advisor for courses offered in Summer Session
COLLEGE BREADTH REQUIREMENTS

• **ENGLISH REQUIREMENT**

Students may take either the English Composition Test (upon completion of 70 units), or take two courses as outlined below.

  o College of Biological Sciences
    - Take 8 units, to include 4 upper-division units, in English Composition from the following list:
      - COM 1, 2, 3, or 4; ENL 3; EVE 12, NAS 5, NEM 150; UWP 1, 18, 19, 101, 102, or 104.
    - Students must pass these classes with a C- or higher.

• **CATALOG YEAR**

You may follow any UC Davis General Catalog that is in effect during any time of your enrollment. Once you have chosen the year of the General Catalog under which you wish to be governed, you must satisfy all of the University, College, and major requirements specified within that Catalog.

• **GENERAL EDUCATION (GE2) REQUIREMENT**

The GE requirement has three components:

  o Socio-Cultural Diversity 1 course
  o Writing Experience 3 courses
  o Topical Breadth
    - Arts & Humanities 3 courses
    - Social Sciences 3 courses
    - Science and Engineering

Since the EXB/NPB majors fall in the area of Science and Engineering, you must select your Topical Breadth courses from Arts & Humanities and Social Sciences.

Note: All courses taken to fulfill the GE requirement must be taken for a letter grade (D- or better).

Students should take advantage of the opportunity to broaden their intellectual horizons and become better acquainted with academic areas outside the EXB and NPB majors. A list of GE courses is provided in the UC Davis General Catalog as well as the quarterly Class Schedule and Registration guide. Many courses satisfy multiple components of the GE requirements (i.e. a class may count towards Diversity, Social Science, and Writing credit) – consult the UC Davis General Catalog.

Note: You cannot use a course to satisfy both the English requirement and the Writing GE requirement.

For General Education (GE3) refer to this website -
http://registrar.ucdavis.edu/ucdwebcatalog/ugraded/gereqt.html
92/192 Work Learn Internships

Internships are an important supplement to your regular course work because they offer critical experience in helping you make effective career decisions while also developing a competitive edge in the job market and/or professional/graduate school admission. Internships are available on a part-time or full-time basis and may be based on- or off-campus. Examples include: research experiences at Genentech or the National Institutes of Health; health administration programs such as the American Cancer Society, Sutter Community Hospitals, and State Department of Health Services; clinical experience at the UC Davis Medical Center or Shriner's Hospital for Children. Visit the Internship and Career Center in South Hall for available 92’s and 192’s.

98/198 Directed Group Study

Professors offer 98/198 credit at their own discretion. These are experimental classes which may eventually be added to the Department’s course offerings. Often, these classes have been seminars on a given topic. For information on current 98/198 courses, first check with the Peer Advisors or Debbie and Dianna in 188 Briggs before consulting with the professor offering the class.

99/199 Undergraduate Research

99/199 courses involve supervised independent study and research. Prior completion of 84 units is required to enroll in 199. Independent study opportunities are available in every department in the College of Biological Sciences and departments affiliated with the UC Davis School of Medicine. To begin your search, consult the “NPB 199 Research Opportunities” binder located in 188 Briggs or the “Research Opportunities in the Biological Sciences” on the CBS website. If you have a particular area of research interest, meet with professors in the field to determine if they have or know of any positions that are available. Students are able to set up 99/199 credit through NPB, other Biological Science majors, the UC Davis School of Medicine, or the Internship and Career Center in South Hall.
SO YOU WANT TO GET INTO RESEARCH…

UC Davis has distinguished itself as one of the leading research institutions in the nation, particularly in the Biological Sciences. In addition to the opportunities presented by the UC Davis Medical School, affiliated hospital, and Veterinary School, you can also become involved with research in neurobiology, physiology, animal behavior/science, psychology, exercise physiology, nutrition -- the list goes on and on. Furthermore, researchers are highly interested in having undergraduates in their labs.

So what are you waiting for? Get out there and get involved with research!

Some reasons to get involved as an undergraduate researcher:

- Chance to explore academic fields outside of the classroom.
- Meet faculty in a field that you are interested in.
- Explore research as a career opportunity.
- Gain valuable laboratory, clinical, interpersonal, and writing skills.

How to obtain a research position:

- Do your research -- find out what fields you are interested in and which professors are in those fields.
  - myucdavis.edu is another great tool.
    - Click on “Research.”
    - From there, you can search through research directories in the College of Bio Sci, School of Medicine, Center for Neuroscience, and School of Veterinary Medicine.

- Once you have found a couple labs/projects that interest you, contact the professors.
  - Make sure you are cordial and express sufficient knowledge of not only what he/she is researching, but also why you are interested in pursuing that field of research.
  - Have some flexibility in your time schedule – most labs prefer undergraduates to have a couple 3-4 hour blocks of availability throughout the week.

- Decide on the best fit.
  - It should be a win-win situation for both you and the professor.
    - The professor gets a hard-working, enthusiastic undergrad who will aid the project.
    - You receive valuable research experience in a field that really interests you! The research project you join should be something you look forward to every day.
    - If interested, you can also receive unit credit for your research, and/or get published and present your research in scientific journals and conferences.
AFTER GRADUATION

GRADUATE PROGRAMS

If you are interested in research, you should seriously consider graduate school. Students who obtain a B.S. in Exercise Biology (EXB) or Neurobiology, Physiology, & Behavior (NPB) can apply to graduate programs in many different fields. EXB and NPB majors have been admitted to graduate programs in Physiology, Anatomy, Animal Behavior, Endocrinology, Neuroscience, Nutrition, Pharmacology and Toxicology, Exercise Biology, Biophysics, Biomedical Engineering, and many others. It is up to you to determine what fits your interests.

- Talk with faculty in the Department working in your area of interest about research opportunities, programs, and graduate schools.
- Contact programs that you are interested in and request information.
- Visit Health Sciences Advising and Graduate Advising in South Hall.

You should aim to apply to several different universities but only to programs in which you have a serious interest.

PROFESSIONAL SCHOOLS

If you are planning to attend a health professional school, visit Health Sciences Advising in South Hall. They will provide you with the information necessary for applying to programs in allopathic and osteopathic medicine, veterinary medicine, dentistry, physical therapy, optometry, pharmacy, and other health science professions.

TEACHING CREDENTIALS

If you are considering teaching as a career, consult an advisor at the School of Education located at 106 AOB IV.

CAREER ADVISING

If you are interested in alternative careers, visit the Internship and Career Center (ICC) located in South Hall. The staff are trained to help students find employment and have developed a series of useful services.

Resources at the ICC include:

- Career advising.
- Career resources library.
- Workshop seminars (job search, resume writing, interview skills).
- Job trend information.
**Pass/Not Pass Option**

Students may take courses using the “Pass/ Not Pass” (P/NP) option. However, there are some important restrictions:

- In the **College of Biological Sciences**, students cannot opt to take any major courses with the P/NP option.
- A maximum of one-fourth of the total units applied to graduation may be graded “Pass” at the students discretion.
- If you are on academic probation (< 2.000 GPA for quarter or overall), you cannot use the P/NP option.
- P/NP courses cannot be used to satisfy any GE2 requirements.

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**Suggested Guidelines For Using the P/NP Option**

- **How important is this course to my application to a postgraduate program?**
  
  If the course is required and is used in the admission decision, take the course for letter grade. You are strongly encouraged to check with Health Sciences Advising or a specific graduate program before electing the P/NP option for a course required for admission. Some postgraduate programs do not accept any required course taken P/NP, and many admission and scholarship review committees interpret “Pass” as a “C” and “Not Pass” as an “F.”

- **What will be the impact of taking one course P/NP on your grades for the quarter?**
  
  If you are taking your typical course load, you should not exercise the P/NP option if your GPA is improving as the “Pass” course will be viewed as a C. However, for a heavier than normal course load, exercising the P/NP option on certain courses may be advantageous as it may be a great way to enjoy an elective class, free up study time, and protect graded courses.
For important updates on the majors and upcoming events check the website (http://npb.ucdavis.edu) and the email list-serve. You can join the NPB list-serve by sending an email to sympa. In the subject line of your message, type in subscribe nameofthelist Firstname Name (replace 'nameofthelist' by the name of the list you want to subscribe to and indicate your own first name and name). Leave the message body blank. Contact Dianna Smith, dbsmith@ucdavis.edu, to be placed on the EXB list-serve. In addition to EXB and NPB Advising Services, UC Davis offers numerous advising services on campus:

**College of Biological Sciences Dean’s Office:** Located at 202 Life Sciences (LS) (752-0410), the Dean's office assists all students in the College with a variety of issues including withdrawal, part-time status, change of major, late action, and academic progress. The “Biological Sciences Handbook” lists all professional advising services and compares the requirements of the various biological science majors.

**The First Resort:** Located in South Hall, The First Resort is a student-staffed general advising and referral center. They can assist you with University procedures and academic concerns, as well as help you locate other campus resources. They can be reached by phone (752-2807).

**Health Sciences Advising (HSA):** HSA can provide you with information and advising about health sciences professions, prerequisites, and admissions procedures. The HSA is an essential resource for students considering graduate school, allopathic or osteopathic medicine, veterinary medicine, dentistry, physical therapy, nursing, or any other allied health field. You can schedule an advising appointment by visiting the South Hall or by phone (752-4100).

**Internship and Career Center (ICC):** The ICC offers internship opportunities throughout the school year that can help you gain practical job experience. EXB/NPB students often participate in health sciences internships with the UC Davis Medical Center and the School of Medicine. The ICC can also arrange research internships. Transcript notation is available for all internships. Visit the ICC on the 2nd floor of South Hall (752-2855).

**Student Academic Success Center (SASC):** Located at 2205 Dutton Hall (752-2013), the SASC provides free tutoring and workshops in writing, mathematics, general and organic chemistry, biology, and physics. You also have access to professional assistance in general study skills, test-taking, and ESL-services.
Looking to be active with the university and the community? Looking for fun? Join the Exercise Biology Club! The EXB club focuses on getting students involved with the faculty, the community, and fellow students within the major. This club represents individuals with the drive for success and the interest to get involved through extracurricular activities. Some of these activities include fundraisers, hiking trips, and charity bike rides. In addition, club meetings are also used to educate individuals about career goals and for the opportunity to meet professionals who work in the field.

Want to know more? Want to get involved? Please visit Club website at http://exbclub.weebly.com or find them on Facebook.
When the Physiology Club began in 1983, it accomplished the goal of forming an organization in which students with similar interests and majors could come together to interact with other students and faculty. Many of the activities that the Physiology Club started, along with some new ones, continue to this day. These activities include guest speakers, potlucks with students and faculty, community service projects, and club socials. Following a reconstruction of the major in 1996, the Physiology Club officially changed its name to form the Neurobiology, Physiology, & Behavior (NPB) Club.

**Presidents’ Message**

Greetings! As the NPB Club President, we would like to welcome and congratulate all incoming freshman, transfer, and returning students as we begin another year. The NPB Club has a fun and exciting year planned, but in order to succeed, we need the support of all our members. We intend to have numerous guest speakers, academic events, community service opportunities, and most importantly, time to relax and **GET INVOLVED** with the NPB Major and UC Davis Campus events. Check out the Club website on npb.ucdavis.edu for membership information and past events.

**GET INVOLVED** with community service programs such as Coats for Kids and Davis Community Meals.

**GET INVOLVED** by attending the Stanford Undergraduate Minority Medical Students Open House and the NPB Club’s mock MCAT and Application Workshop.

**GET INVOLVED** by coming to our “Midterm Madness Relaxation Workshops,” better known as: bowling night, movie night, camping trips, and other off-campus events.

**GET INVOLVED** by playing an active role in the club. Get to know the family that will be in your classes and the professors who will be your mentors by attending the Student-Faculty Potluck.

**GET INVOLVED** by participating in the coolest Picnic Day Activities – our Physiology and Veterinary Exhibits.

Sincerely,
Scott Hirsch
President 2012-13
A Winning Combination

Faculty members in the Section of Neurobiology, Physiology, & Behavior (NPB) have a variety of backgrounds and interests. This diversity allows them to excel in their chosen fields with respect to teaching, research, and advising. Students are strongly encouraged to become involved in research to supplement their classroom experiences. Our faculty is pleased to engage in discussions related to research, academic aspects of the NPB major, as well as provide information if students need to make informed decisions on alternatives to the major. Their dedication to teaching, research, and advising has been recognized by their peers and by the administration at UC Davis. The following individuals have been honored:

**ASUCD Excellence in Teaching – College of Biological Sciences**
- James Shaffrath (2010, 2011)
- Andrew Ishida (2012)

**Academic Senate Distinguished Teaching Award:**
- Barbara Horwitz (1982)
- Arnold Sillman (1995)

**Academic Federation Excellence in Teaching Award:**
- Thomas Adamson (1996)
- Michael Guinan (2000)
- Erwin Bautista (2007)
- James Shaffrath (2008)

**College of Biological Sciences Faculty Teaching Award:**
- James Shaffrath (2008)

**Outstanding Teaching Assistant Award:**
- Thomas Adamson (1982)
- Ann Motekaitis (1991)
- Wayne Meyer (1992)
- Carlos Crocker (1996)
- Brant DeFanti (1996)
- Erwin Bautista (1997)
- Shawn Hayes (1998)
- Greg Cunningham (2005)
- Robin Altman (2007)
- Linda Barter (2007)

**Author C. Guyton Teaching Award – American Physiological Society**
- Barbara Horwitz (1996)

**UC Davis Prize for Teaching & Scholarly Achievement**
- Barbara Horwitz (1991)

**Presidential Award for Excellence in Undergraduate Research**
- Barbara Horwitz (1995)

**Excellence in Education, College of Biological Sciences**
- Joseph Antognini (2007)

**Mentorship Award, College of Biological Sciences**
- Samantha Harris (2011)

**New Generation Award – Society for Neuroscience**
- Karen Zito (2008)

**Cal Aggie Hall of Fame**
- Keith Williams (2008)
AFRICAN AMERICAN FAMILY WEEK OUTSTANDING ACHIEVEMENT AWARDS

Nominees for these awards must be in good academic standing

- **ACADEMIC AWARD**
  - Honors a student who has enjoyed a distinguished academic career and maintained a high GPA.

- **CREATIVITY AWARD**
  - Honors students who have been active in student body politics, media, clubs and organizations, or who have worked for the campus community in a service capacity.

- **ATHLETIC ACHIEVEMENT AWARD**
  - Honors students who have participated in athletic competition.

THE GAMMA DELTA CHAPTER OF PHI SIGMA

Phi Sigma is the National Honor Society for Biology. Students elected to membership must have achieved outstanding records. Election to this honorary society is one of the most prestigious awards a student can receive. Undergraduate nominees should have a minimum cumulative GPA of 3.40 and an excellent academic record in the biological sciences. In addition, students should have exhibited research interest (i.e. 194, 199, work-study, or other research activity). Students are nominated for membership by their major.
Prizes & Awards

The requirements for various awards, prizes, and honorary societies for which Exercise Biology (EXB) and Neurobiology, Physiology, & Behavior (NPB) majors are eligible are listed below. To minimize overlooking potential nominees, we encourage you to make an appointment with the Academic Advisor if you feel that you meet the criteria for one or more of the awards and would like to be considered. In general, nominations are requested at the beginning of winter quarter.

Departmental Citations

Citations are awarded to graduating students who have achieved academic excellence in their major and participated in an independent research project. Students should maintain a 3.60 GPA both overall and in their academic major.

In addition, the following awards are offered to celebrate a student's initiative and outstanding contribution of their knowledge, time, energy, and enthusiasm to serve and improve the University and/or community at large:

• Quarterly Honors List & Honors at Graduation
  o The College of Biological Sciences will set grade-point minimum standards at the end of each quarter (for the Quarterly list) and the end of winter quarter (for Honors at Graduation).
  o Students who meet these prescribed GPA standards will be awarded Honors, High Honors, or Highest Honors.

• Mary Jeanne Gilhooly & Veloyce Glenn Winslow Jr. Awards
  o Awarded to the most Outstanding Graduating Woman and Man.
  o Must be a graduating senior who has attended UC Davis for at least 2 academic years.
  o Self-nominations are acceptable.

• Chancellor’s Awards for Merit
  o Awarded to finalists for the Gilhooly and Winslow Awards.

• Margarita Robinson Student Leadership Award
  o Awarded for superior leadership experience in organized student groups and activities.
  o Must be in the 2nd or 3rd year of attendance at UC Davis and have attained junior status at time of selection.
  o Minimum 2.50 GPA both overall and in academic major.
KEITH BAAR
181 Briggs Hall, 752-3367, kbaar@ucdavis.edu
Degrees: B.S. University of Michigan - 1992
M.A. University of California, Berkeley - 1994
Ph.D. University of Illinois - 2000
Primary Research: Understanding how exercise creates bigger, stronger, more fatigue resistant muscles. Engineering functional muscle, tendons and ligaments for clinical applications

ERWIN A. BAUTISTA
1015 Sciences Lab, 752-0214, eabaustista@ucdavis.edu
Degrees: B.S. University of California, Los Angeles -- 1991
Ph.D. University of California, Davis -- 2001
Primary Research Interests: Energy balance, metabolism and glucose regulation, hibernation

SUE C. BODINE
189 Briggs Hall, 752-0694, scbodine@ucdavis.edu
Degrees: B.S. University of California, Los Angeles -- 1981
Ph.D. University of California, Los Angeles -- 1985
Primary Research Interests: Regulation of skeletal muscle size and function. Skeletal muscle adaptation

KENNETH H. BRITTEN
Center for Neuroscience; 754-5080, khbritten@ucdavis.edu
Degrees: B.S. California Institute of Technology -- 1980
Ph.D. State University of New York -- 1987
Primary Research Interests: Physiological mechanisms underlying visual perception
KENNETH H. BRITTEN
Center for Neuroscience; 754-5080, khbritten@ucdavis.edu

Degrees:  
B.S.  California Institute of Technology -- 1980  
Ph.D.  State University of New York -- 1987  

Primary Research Interests:  
Physiological mechanisms underlying visual perception  

EARL E. CARSTENS
193 Briggs Hall, 752-6640/7767, eecarstens@ucdavis.edu

Degrees:  
B.S.  Cornell University -- 1972  
Ph.D.  University of North Carolina -- 1977  

Primary Research Interests:  
Neurophysiological mechanisms of analgesia in the central nervous system; sensorimotor integration  

GRETCHEL A. CASAZZA
UC Davis Sports Medicine Program; (916) 734-5632, gretchen.casazza@ucdmc.ucdavis.edu

Degrees:  
B.S.  University of California, Davis – 1989  
M.S.  University of California, Davis -- 1994  
Ph.D.  University of California, Berkeley -- 2003  

Primary Research Interests:  
Effects of ovarian hormones on musculoskeletal health and metabolism.  
Exercise therapy for disease prevention and sports performance  

ERNEST S. CHANG
Department of Animal Science; Bodega Marine Lab, (707) 875-2061, eschang@ucdavis.edu

Degrees:  
B.A.  University of California, Berkeley -- 1973  
Ph.D.  University of California, Los Angeles -- 1978  

Primary Research Interests:  
Hormonal and pheromonal mechanisms of reproduction, growth, and development of invertebrates
Barbara X. Chapman

Center for Neuroscience; 754-5012, bxchapman@ucdavis.edu

Degrees: B.A. Harvard and Radcliffe Colleges -- 1984
         Ph.D. University of California, San Francisco -- 1991

Primary Research Interests: Development of specific neuronal connections in vertebrate sensory systems

Hwai-Jong Cheng

Center for Neuroscience; Department of Pathology & Laboratory Medicine; 752-5323, hjcheng@ucdavis.edu

Degrees: M.D. National Taiwan University -- 1989
         Ph.D. Harvard University -- 1995

Primary Research Interests: Developmental neurobiology

William De Bello

Center for Neuroscience; 754-7165, wmdebello@ucdavis.edu

Degrees: B.S. Stanford University -- 1990
         Ph.D. Duke University -- 1996

Primary Research Interests: Cellular mechanisms that underlie adaptive plasticity of the central auditory system

Jochen Ditterich

Center for Neuroscience; 754-5084, jditterich@ucdavis.edu

Degrees: Diploma Technical University of Munich, Germany -- 1995
         Ph.D. Technical University of Munich, Germany -- 2000

Primary Research Interests: Neural and computational mechanisms of decision-making, primarily studied in the visual system
NPB Faculty

Charles A. Fuller
CARU, 752-2979, cafuller@ucdavis.edu

Degrees:
- B.S. University of California, Davis -- 1971
- M.S. University of California, Davis – 1973
- Ph.D. University of California, Davis -- 1975

Primary Research Interests:
Physiology and neural control of metabolism, circadian rhythms, and sleep in mammals. Environmental effects (light and gravity) on the regulation of these systems

J. David Furlow
274 Briggs Hall, 754-8609, jdfurlow@ucdavis.edu

Degrees:
- B.S. Pennsylvania State University -- 1985
- Ph.D. University of Wisconsin, Madison -- 1992

Primary Research Interests:
Hormonal control of development and reproduction

Mark S. Goldman
Center of Neuroscience; Department of Ophthalmology and Visual Sciences, 757-8749, msgoldman@ucdavis.edu

Degrees:
- B.A. Stanford University – 1993
- Ph.D. Harvard University -- 2000

Primary Research Interests:
Computational neuroscience

Aldrin V. Gomes
177 Briggs Hall, 752-3207, avgomes@ucdavis.edu

Degrees:
- B.S. University of The West Indies, St. Augustine -- 1992
- Ph.D. University of The West Indies, St. Augustine -- 1998

Primary Research Interests:
Role of Proteasomes and Troponins in cardiac and skeletal muscle diseases. Protein degradation and cardiomyopathies
ALDRIN V. GOMES
177 Briggs Hall, 752-3207, avgomes@ucdavis.edu

Degrees:  
B.S.  University of The West Indies, St. Augustine -- 1992  
Ph.D.  University of The West Indies, St. Augustine -- 1998  

Primary Research Interests:  
Role of Proteasomes and Troponins in cardiac and skeletal muscle diseases. Protein degradation and cardiomyopathies

THOMAS P. HAHN
Animal Communication Lab; 752-8531, tphahn@ucdavis.edu

Degrees:  
B.S.  Stanford University – 1984  
M.S.  Stanford University -- 1985  
Ph.D.  University of Washington -- 1993  

Primary Research Interests:  
Behavior, physiology, ecology, and evolution of songbirds. Neuroendocrine regulation of avian reproduction cycles. Roles of culturally-transmitted traits and experience on songbird behavior

SAMANTHA HARRIS
177 Briggs, 752-0642, samharris@ucdavis.edu

Degrees:  
B.S.  University of Illinois -- 1988  
Ph.D.  University of Michigan -- 1995  

Primary Research Interests:  
Cardiac Muscle Contraction

DAVID A. HAWKINS
275 Hickey Gym, 752-2748, dahawkins@ucdavis.edu

Degrees:  
B.S.  California Polytechnic State University, San Luis Obispo – 1983  
M.S.  University of California, San Diego -- 1985  
Ph.D.  University of California, Davis -- 1990  

Primary Research Interests:  
Musculoskeletal biomechanics; structural integrity and performance of musculoskeletal structures and gross human movement; developing strategies to individualize physical activity dose and movement mechanics that will allow a person to increase their health, quality of life, and physical performance capabilities while minimizing their risk of injury
ANN V. HEDRICK
1011 LS, 754-7611, avhedrick@ucdavis.edu

Degrees: B.S. University of Virginia -- 1977
M.S. University of California, Davis -- 1984
Ph.D. University of California, Davis -- 1987

Primary Research: Sexual selection, female choice of mates, anti-predator behavior,
Interests: consistency of behavioral traits, correlations among behavioral traits

BARBARA A. HORWITZ
Department of Physiology & Membrane Biology; 280A Briggs Hall, 752-0169, bahorwitz@ucdavis.edu

Degrees: B.S. University of Florida -- 1961
M.S. University of Florida -- 1962
Ph.D. Emory University -- 1966

Primary Research: Genetic, neural, and hormonal regulation of metabolism; cellular and
Interests: molecular basis of obesity; mechanisms resulting in neuroprotection

ANDREW T. ISHIDA
Department of Ophthalmology & Vision Science; 1133 LS, 752-3569, atishida@ucdavis.edu

Degrees: Ph.D. University of California, Los Angeles -- 1981

Primary Research: Light adaptation, neuromodulation, spikes, ion channels, and signaling
cascades in adult mammalian retinal ganglion cells

LAUREN C. LIETS
2033A Sciences Lab, 752-3897, lcliets@ucdavis.edu

Degrees: B.A. California State University, Sacramento -- 1989
Ph.D. University of California, Davis -- 1997

Primary Research: Mechanisms of neural development and aging

SECTION OF NEUROBIOLOGY, PHYSIOLOGY, & BEHAVIOR
**KIM MCA LLISTE R**

Department of Neurology; Center for Neuroscience; 752-8114, kmcallister@ucdavis.edu

Degrees:
- B.S. Davidson College -- 1988
- Ph.D. Duke University -- 1996

Primary Research Interests:
- Cellular and molecular mechanisms of synapse formation in the developing cerebral cortex

**LEE MILLER**

Center for Mind & Brain, 297-4474, leemiller@ucdavis.edu

Degrees:
- B.S. Duke University -- 1993
- Ph.D. University of California, San Francisco & University of California Berkeley -- 2001

Primary Research Interests:
- Multi-sensory integration and speech perception. Methods include fMRI, high-density EEG, psychophysics, and neural network analysis

**ALEXANDER MOGILNER**

Department of Mathematics; 178 Briggs; 752-1072; mogilner@math.ucdavis.edu

Degrees:
- M. Eng. Ural Polytechnical Insitute -- 1985
- Ph.D. University of British Columbia -- 1995

Primary Research Interests:
- Cell Biophysics, Cell Motility, Mitosis and cytokinesis motility of fish keratocytes, mitotic spindle assembly, platelets

**BRIAN MULLONEY**

1011 LS, 752-1110, bemulloney@ucdavis.edu

Degrees:
- B.S. McGill University – 1963
- M.A. University of California, Berkeley -- 1966
- Ph.D. University of California, Berkeley -- 1969

Primary Research Interests:
- Neural basis of behavior, dynamics of neural circuits, modulation of neuronal excitability, synaptic transmission, and synaptic integration
NPB Faculty

GABRIELLE A. NEVITT
1131 LS, 752-5929 / 4-9500, ganevitt@ucdavis.edu

Degrees: B.S. Stanford University -- 1982
M.S. Stanford University -- 1983
Ph.D. University of Washington -- 1990

Primary Research Interests: Organism-Environment interaction with an emphasis on Sensory/
Chemical ecology in seabirds (petrels and albatrosses) and fishes

MARILYN RAMENOFSKY
mramenofs@ucdavis.edu

Degrees: B.S. Pomona College -- 1984
M.Sc. University of Texas, Austin -- 1972
Ph.D. University of Washington, Seattle -- 1982

Primary Research Interests: Environmental signals and the physiological and behavioral
expressions of the migration life history stage

GREGG H. RECANZONE
Center of Neuroscience; 754-5086, ghrecanzone@ucdavis.edu

Degrees: B.S. University of California, San Diego -- 1984
Ph.D. University of California, San Francisco -- 1990

Primary Research Interests: Understanding how aging affects our auditory perception at the level of
behavior and single cell activity

GRACE ROSENQUIST
179 Briggs Hall, 752-4973, rosenqui@yahoo.com

Degrees: B.A. Willamette University -- 1954
Ph.D. University of Wisconsin -- 1961

Primary Research Interests: Bioinformatics. Prediction of tertiary protein structure, tyrosine
sulfonation, and tyrosine trafficking motifs
NPB Faculty

Paul B. Salitsky
285 Hickey Gym, 752-3381, pbsalitsky@ucdavis.edu

Degrees:
B.A. The American University – 1977
M.A. University of Maryland, College Park -- 1990
Ph.D. Temple University -- 1994

Primary Research Interests:
Applied sport and exercise psychology, coaching education

James D. Shaffrath
269 Hickey Gym, 752-0704, jdshaffrath@ucdavis.edu

Degrees:
B.S. University of California, Davis -- 1980
M.A. University of California, Davis -- 1983
M.D. University of California, Davis -- 1987

Primary Research Interests:
Environmental effects on human performance, clinical exercise physiology, cardiovascular regulation during prolonged exercise

Mitchell L. Sutter
Center for Neuroscience; 754-5078, mlsutter@ucdavis.edu

Degrees:
B.S. Brown University -- 1985
Ph.D. University of California, San Francisco & University of California, Berkeley -- 1991

Primary Research Interests:
Neural signal processing in the auditory cortex of the vertebrate brain

James S. Trimmer
Department of Physiology and Membrane Biology; 1009 LS; 754-6075/6076, jtrimmer@ucdavis.edu

Degrees:
B.S. University of California, San Diego -- 1981
Ph.D. University of California, San Diego -- 1987

Primary Research Interests:
Cellular and molecular neurobiology
NPB FACULTY

W. MARTIN USREY
Department of Neurology; Center for Neuroscience; 754-5468, wmusrey@ucdavis.edu

Degrees:
- B.A. University of California, San Diego -- 1987
- M.S. San Diego State University -- 1989
- Ph.D. Duke University -- 1994

Primary Research Interests:
Functional properties of neural circuits in the visual system

CRAIG H. WARDEN
Department of Pediatrics; Rowe Genetics; 752-4187, chwarden@ucdavis.edu

Degrees:
- B.S. University of California, Riverside -- 1975
- Ph.D. University of California, San Diego -- 1982

Primary Research Interests:
Discover and understand the biological causes of obesity, physiological impact of mutations in obesity genes, and novel obesity genes

W. JEFFREY WEIDNER
195 Briggs Hall, 752-3208, wjweidner@ucdavis.edu

Degrees:
- B.A. Michigan State University -- 1968
- M.S. Michigan State University -- 1971
- Ph.D. Michigan State University -- 1973

Primary Research Interests:
Cardiopulmonary physiology

JOHN S. WERNER
Department of Ophthalmology & Vision Science; (916) 734-6817, jswerner@ucdavis.edu

Degrees:
- B.A. University of Kansas -- 1974
- Ph.D. Brown University -- 1979

Primary Research Interests:
Human vision and visual perception. Emphasis on changes in vision associated with aging and retinal disease
KEITH WILLIAMS

279 Hickey Gym, 752-3337, krwilliams@ucdavis.edu

Degrees:
B.S. University of California, Davis -- 1971
M.A. University of California, Davis – 1977
Ph.D. Pennsylvania State University -- 1980

Primary Research: Biomechanics of human locomotion, particularly distance running.
Interests: Relationships with metabolic energy costs, injury, and footwear.

JOHN C. WINGFIELD

294 Briggs, 752-4679, jcwingfield@ucdavis.edu

Degrees:
Ph.D. University College North Wales -- 1973
Degree of Doctor Honoris Causa, University of Göteborg, Sweden - 1998

Primary Research: Environmental endocrinology: mechanisms for life cycles.
Interests: How organisms (vertebrates) organize their life cycles and cope with a changing environment. This includes environmental and social control of reproduction, migration, molt and wintering strategies; coping mechanisms for environmental perturbations (stress); and effects of global climate change, mechanistic approaches to conservation biology. The research involves field as well as laboratory investigations from molecules to organism.

KAREN ZITO

Center of Neuroscience; 752-7832, kzito@ucdavis.edu

Degrees:
B.S. Indiana University -- 1991
Ph.D. University of California, Berkeley -- 1998

Primary Research: Development of synaptic connections.
Active Emeritus / Emerita Faculty

Leo M. Chalupa
Department of Ophthalmology & Vision Science; 184 Briggs Hall, 752-1617, lmchalupa@ucdavis.edu

Degrees:  B.S. Queens College -- 1966
          Ph.D. City University of New York -- 1970

Primary Research Interests: Developmental neurobiology

Jack M. Goldberg
jmgoldberg@ucdavis.edu

Degrees:  B.S. Northern Illinois University -- 1966
          Ph.D. Loyola University -- 1974

Primary Research Interests: Cardiac electrophysiology, pacemaker function, and cardiac conductivity

Robert G. Holly
rgholly@ucdavis.edu

Degrees:  B.A. Macalester College -- 1966
          Ph.D. University of California, Davis -- 1971

Primary Research Interests: Exercise physiology and clinical exercise physiology

John M. Horowitz
280J Briggs Hall, 752-3206, jmhorowitz@ucdavis.edu

Degrees:  B.A. University of California, Berkeley -- 1959
          M.S. University of California, Berkeley -- 1961
          Ph.D. University of California, Berkeley -- 1968

Primary Research Interests: Neurobiology of hippocampal networks, temperature regulation in cold-exposed mammals, central nervous system memory mechanisms
Active Emeritus / Emerita Faculty

Peter R. Marler
Animal Communication Lab; 752-0720, prmarler@ucdavis.edu

Degrees:  
B.S. University of London -- 1948  
Ph.D. University of London & Cambridge University -- 1954

Primary Research Interests:  

Verne E. Mendel

vemendel@ucdavis.edu

Degrees:  
M.S. University of Idaho -- 1958  
Ph.D. University of California, Davis -- 1960

Primary Research Interests:  
Role of the gut in feeding behavior. Characterization of satietin, an anorexigenic agent.

Pamela A. Pappone

1009 LS, 752-2673, papappone@ucdavis.edu

Degrees:  
B.A. Reed College -- 1972  
Ph.D. University of Washington -- 1979

Primary Research Interests:  
Electrophysiology of ion channels in excitable and unexcitable cells. Role of membrane transport processes in cell functions. Structure-function relationships in channel proteins and regulation of channel properties.
Arnold J. Sillman
ajsillman@ucdavis.edu

Degrees:
B.A. University of California, Los Angeles -- 1963
M.A. University of California, Los Angeles -- 1965
Ph.D. University of California, Los Angeles -- 1968

Primary Research Interests:
Biology of the vertebrate visual system with emphasis on photoreceptors and the visual pigments contained within them. Relation of visual physiology to behavior, environment, and phylogenetic position.

Martin C. Wilson
1163 LS, 752-7250, mcwilson@ucdavis.edu

Degrees:
B.S. University of Bristol -- 1970
Ph.D. Cambridge University -- 1973

Primary Research Interests:
Retinal synapses

Dorothy E. Woolley
dewoolley@ucdavis.edu

Degrees:
B.S. Bowling Green -- 1950
M.S. Ohio State University -- 1957
Ph.D. University of California, Berkeley -- 1961

Primary Research Interests:
Neurophysiological basis of neurotoxicology, factors affecting brain evoked potentials, food intake and temperature regulation.
**NPB Prerequisite Course Pattern**

**General Chemistry Sequence**
(The General Chemistry Sequence is typically completed during the first two years)

- Chem 2A
  - Chem 2B
  - Chem 2C

**Organic Chemistry Sequence**
(Most students begin this sequence during their 2nd or 3rd year)

- Chem 8A → Chem 8B
  - or -
  - Chem 118A → Chem 118B
  - or -
  - Chem 128A → Chem 128B
  → Chem 118C

**Upper Division Biology Sequence**
(Most students begin this sequence in their 3rd year)

- Bis 2A ↔ Bis 2B ↔ Bis 2C
- Bis 101
- Bis 105
  - or -
  - (Bis 102 + Bis 103)
  - Bis 104

**NPB Upper Division Series**
(Most students begin this sequence in their 3rd or 4th year)

- NPB 101 ↔ NPB 100
- NPB 102
  - or -
  - NPB 101L

**Mathematics Sequence**
(Most students start this sequence sometime during their 1st year)

- Math 17A → Math 17B → Math 17C
  - or -
  - Math 21A → Math 21B

**Physics Sequence**
(Most students begin this sequence in their 2nd or 3rd year)

- Phy 7A
  - or -
  - Phy 7B
  - or -
  - Phy 7C
EXERCISE BIOLOGY PROGRAM REQUIREMENTS

AB DEGREE 2010-2011

NAME

Please remember that you will need to complete your GE and College requirements and that the College of Biological Sciences has additional requirements for the AB degree (including 1 year of a Foreign language and a Mini-Minor or Minor or Double Major)

<table>
<thead>
<tr>
<th>LOWER DIVISION CORE</th>
<th>(37 – 40 units)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIS 2A (4; I, II, III)</td>
<td></td>
</tr>
<tr>
<td>BIS 2B (5; I, II, III)</td>
<td></td>
</tr>
<tr>
<td>BIS 2C (5; I, II, III)</td>
<td></td>
</tr>
<tr>
<td>CHE 2A (5; I, II) or 2AH* (5; I)</td>
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<tr>
<td>CHE 2B (5; II, III) or 2BH* (5; II)</td>
<td></td>
</tr>
<tr>
<td>PHY 1A (3; I) or 7A (4; I, II, III)</td>
<td></td>
</tr>
<tr>
<td>PHY 1B (3; II) or 7B (4; I, II, III)</td>
<td></td>
</tr>
<tr>
<td>PSC 1 (4; I, II, III)</td>
<td></td>
</tr>
<tr>
<td>STA 13 (4; I, II, III) or 32* (3; II, III) or 100* (4; I, III) or 102 (4; I, III)</td>
<td></td>
</tr>
</tbody>
</table>

(STA 100 recommended statistics course - MAT 16B/17B is a prerequisite)

Other recommended course: PSC 41

<table>
<thead>
<tr>
<th>UPPER DIVISION CORE</th>
<th>(31 units)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Prerequisite(s)</th>
</tr>
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<tbody>
<tr>
<td>BIS 101 (4; I) NPB 101</td>
</tr>
<tr>
<td>BIS 102 (4; I, II) PSC 1 recommended</td>
</tr>
<tr>
<td>BIS 106 (4; II)</td>
</tr>
<tr>
<td>BIS 106L (3; II)</td>
</tr>
<tr>
<td>PHY 7A-B</td>
</tr>
<tr>
<td>NPB 101 recommended</td>
</tr>
<tr>
<td>EXB 101, 102, 103</td>
</tr>
</tbody>
</table>

(the last course may be taken concurrent)

AREAS OF EMPHASIS ELECTIVES AND DEPTH OF SUBJECT MATTER (9-14 units)

Check catalog for prerequisites

Select one additional upper division EXB courses**:

| EXB |

Select one additional course from two of the three areas listed below:

Sociology & Culture: AAS 100; ANT 101; CMN 165; CRD 176; EXB 120; HIS 178B; SAS 105, 120; STS 150; SOC 122, 154, 159, 172

History & Philosophy: DRA 141; HIS 135A, 135B, 136, 139A, 139B, 185A; PHI 108; STS 130A, 130B, 131

Psychology & Communication: ARE 112; CMN 134, 136; EXB 121, 122; HDE 100C; PSC 101, 121, 126, 140

TOTAL UNITS FOR MAJOR ........................................77-85

NOTE: THE HUMAN ANATOMY LABORATORY MUST BE BASED ON HUMAN CADAVERS

Check the catalog to verify current course prerequisites.

*These courses have more advanced prerequisites; check catalog

**None of the variable-unit courses or Exercise Biology 148, 148L may be used to fulfill these requirements.

Consult your adviser regularly.

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**LOWER DIVISION CORE (55-73 units)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Prerequisite(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIS 2A</td>
<td>BIS 2A</td>
</tr>
<tr>
<td>BIS 2B</td>
<td>BIS 2B</td>
</tr>
<tr>
<td>BIS 2C</td>
<td>CHE 2A</td>
</tr>
<tr>
<td>CHE 2A</td>
<td>Qualifying Exams</td>
</tr>
<tr>
<td>CHE 2B</td>
<td>CHE 2A/AH</td>
</tr>
<tr>
<td>CHE 2C</td>
<td>CHE 2B/BH</td>
</tr>
<tr>
<td>CHE 2D</td>
<td>CHE 2B w/c- or higher</td>
</tr>
<tr>
<td>CHE 8A</td>
<td>CHE 8A/118A</td>
</tr>
<tr>
<td>CHE 8B</td>
<td>CHE 118B</td>
</tr>
<tr>
<td>CHE 118C</td>
<td>only required if doing the CHE 118 series</td>
</tr>
<tr>
<td>MAT 17A</td>
<td>MAT 17A/21A</td>
</tr>
<tr>
<td>MAT 17B</td>
<td>MAT 17B/21B</td>
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<tr>
<td>MAT 17C</td>
<td>PHY 7A</td>
</tr>
<tr>
<td>PHY 7A</td>
<td>PHY 7B</td>
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<tr>
<td>PHY 7C</td>
<td>PHY 7B</td>
</tr>
<tr>
<td>PHY 9D</td>
<td>PHY 7B</td>
</tr>
</tbody>
</table>

PSC 1 is highly recommended for all students; MAT 21C recommended for students taking MAT 21AB; MAT 21A-D, 22-B; PHY 9A-D; ENG 6, 35 are recommended for students planning on entering a Biomechanics related graduate program.

**UPPER DIVISION CORE (41-44 units)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Prerequisite(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXB 101</td>
<td>NPB 101</td>
</tr>
<tr>
<td>EXB 102</td>
<td>PSC 1 recommended</td>
</tr>
<tr>
<td>EXB 103</td>
<td>EXB 106, 106L or COI</td>
</tr>
<tr>
<td>EXB 104L</td>
<td>last course may be concurrent</td>
</tr>
<tr>
<td>EXB 106</td>
<td>BIS 2A; EXB 106L concurrent</td>
</tr>
<tr>
<td>EXB 106L</td>
<td>EXB 106 concurrent see note</td>
</tr>
</tbody>
</table>

**DEPTH OF SUBJECT MATTER** (Check catalog for prerequisites)

Completion of 3 courses (9-12 units) selected from the following (see advisor for help in selecting appropriate course sequences):

1 course from Group A (3-4 units)
1 additional course from Group A or Group B (3-4 units)
1 additional course from Groups A, B or C (3-4 units)

**GROUP A:**

EXB 111 (3; II), 112 (4; II), 115 (3; I), 126 (3; II)

**GROUP B:**

EXB 110 (3; III), 113 (3, III), 117 (3; III), 124 (4; II) 125 (3), 179 (3)
(or from Group A)

**GROUP C:**

EXB 122 (3; III), EAD 115 (4; I, II, III); ENG 102 (4; I, II, III); NPB 112 (3; II), 113 (4), 140 (3; II); NUT 111AV (3; III)
(or from Group A or B)

**TOTAL UNITS FOR MAJOR** 105-129

NOTE: THE HUMAN ANATOMY LABORATORY MUST BE BASED ON HUMAN CADAVERS

Check the catalog to verify current course prerequisites.

*These courses have more advanced prerequisites; check catalog.

I=Fall, II=Winter, III=Spring

Rev 08/10
**NPB STUDY PLAN FORM**

Neurobiology, Physiology, & Behavior

| Name: | | | | |
|-------|---|---|---|

<table>
<thead>
<tr>
<th>Fall 20___</th>
<th>Winter</th>
<th>Spring</th>
<th>Summer</th>
</tr>
</thead>
<tbody>
<tr>
<td>PREPARATORY SUBJECT MATTER (55-65)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Biological Sciences (14)**

- BIS 2A 2B 2C (14)

**Chemistry (21-27)**

- CHEM 2A 2B 2C (15)
- CHEM 2HA 2HB 2HC (15)
- CHEM 8A 8B (6)
- CHEM 118A 118B 118C (12)
- CHEM 128A 128B (6)

<table>
<thead>
<tr>
<th>Fall 20___</th>
<th>Winter</th>
<th>Spring</th>
<th>Summer</th>
</tr>
</thead>
</table>

**Mathematics (8-12)**

- MATH 17A 17B 17C (12)
- MATH 21A 21B (8)

**Physics (12)**

- PHY 7A 7B 7C (12)

**DEPTH SUBJECT MATTER (47-52)**

- BIS 101, 105 (10-13)
- NPB 100 101 102 (12)
- NPB 101L (3)
- NPB 104L or 106 or 111C (3-4)
- STA 100 (4)

**Upper Division Depth (12)**

| | | | |
| | | | |
| | | | |

**Evolution Requirement (3-4)**

- ANT 151 or EVE 100 or GEL 107 (3-4)

Advisor’s Signature | Date

---

Section of Neurobiology, Physiology, & Behavior