

## PREREQUISITE CHECKLIST

UNIVERSITY OF CALIFORNIA, BERKELEY SCHOOL OF OPTOMETRY  
ADMISSIONS AND STUDENT AFFAIRS OFFICE

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

Email: \_\_\_\_\_

| <b>Status</b><br>(complete,<br>in progress,<br>or planned) | <b>Prerequisite Course Requirements<br/>and Descriptions</b><br>(We provide these descriptions to help guide<br>your course selections)  | <b>Completed, In Progress<br/>or Planned Prerequisites</b><br>(List course name, number,<br>description, units and institution) |
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|  | <p><b>General Chemistry</b><br/>(Lecture and lab; 2 semesters or 3 quarters)</p> <p><b>1. General Chemistry -- Chemistry</b><br/><b>Course Format:</b> Three hours of lecture and four hours of laboratory per week.<br/><b>Description:</b> Stoichiometry of chemical reactions, quantum mechanical description of atoms, the elements and periodic table, chemical bonding, real and ideal gases, thermochemistry, introduction to thermodynamics and equilibrium, acid-base and solubility equilibria, introduction to oxidation-reduction reactions</p> <p><b>2. General Chemistry -- Chemistry</b><br/><b>Course Format:</b> Two hours of lecture and four hours of laboratory per week.<br/><b>Description:</b> Introduction to chemical kinetics, electrochemistry, properties of the states of matter, binary mixtures, thermodynamic efficiency and the direction of chemical change, quantum mechanical description of bonding introduction to spectroscopy. Special topics: Research topics in modern chemistry and biochemistry, chemical engineering.</p> |   |
|  | <p><b>Organic Chemistry</b><br/>(Lecture and lab; 1 semester or 1 quarter)</p> <p><b>Chemical Structure and Reactivity</b><br/><b>Course Format:</b> Three hours of lecture per week.<br/><b>Description:</b> Introduction to organic chemical structures, bonding, and chemical reactivity. The organic chemistry of alkanes, alkyl halides, alcohols, alkenes, alkynes, and organometallics.</p> <p><b>Organic Chemistry Laboratory Course</b><br/><b>Format:</b> One hour of lecture and four hours of laboratory per week.<br/><b>Description:</b> Introduction to the theory and practice of methods used in the organic chemistry laboratory. An</p> <p style="text-align: center;"><b>- next page-</b></p>  |   |

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|  | <p>emphasis is placed on the separation and purification of organic compounds. Techniques covered will include extraction, distillation, sublimation, recrystallization, and chromatography. Detailed discussions and applications of infrared and nuclear magnetic resonance spectroscopy will be included.</p>  |  |
|  | <p><b><u>Biochemistry</u></b><br/>(Lecture only, lab preferred; 1 semester or 1 quarter)</p> <p><b>Biochemistry: Pathways, Mechanisms, and Regulation</b><br/><b>Course Format:</b> Two hours of lecture and one hour of discussion per week.<br/><b>Description:</b> Bioenergetics, metabolic pathways, and regulation of metabolism; the chemistry, structure, function, synthesis, and degradation of the constituent molecules (amino acids, fatty acids, sugars, nucleotides) and cofactors of the major biological macromolecules. Diseases that are linked to metabolic disorders. Designed for majors in the biochemistry and molecular biology, genetics and development, or immunology emphases.</p> <p><b>Survey of the Principles of Biochemistry and Molecular Biology</b><br/><b>Course Format:</b> Three hours of lecture and one hour of discussion per week.<br/><b>Description:</b> A comprehensive survey of the fundamentals of biological chemistry, including the properties of intermediary metabolites, the structure and function of biological macromolecules, the logic of metabolic pathways (both degradative and biosynthetic) and the molecular basis of genetics and gene expression.</p> |  |
|  | <p><b><u>General Biology or Zoology</u></b><br/>(Lecture and lab; 2 semesters or 3 quarters)</p> <p><b>1. General Biology Lecture</b><br/><b>Course Format:</b> Three hours of lecture and one hour of discussion per week.<br/><b>Description:</b> General introduction to cell structure and function, molecular and organismal genetics, animal development, form and function. Intended for biological sciences majors, but open to all qualified students.</p> <p><b>General Biology Laboratory</b><br/><b>Course Format:</b> One and one-half hours of lecture and three hours of laboratory per week.<br/><b>Description:</b> Laboratory that accompanies lecture course. Intended for biological science majors, but open to all qualified students.</p> <p><b>2. General Biology</b><br/><b>Course Format:</b> Three hours of lecture, three hours of laboratory, and one hour of discussion per week.<br/><b>Description:</b> General introduction to plant development, form, and function; population genetics, ecology, and evolution. Intended for students majoring in the biological sciences, but open to all qualified students.</p>  |  |

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|  | <p><b><u>General Physics</u></b></p> <p>(Lecture and lab; 2 semesters or 3 quarters)</p> <p><b>Introductory Physics</b><br/> <b>Course Format:</b> Three hours of lecture and four hours of discussion/laboratory week.<br/> <b>Description:</b> Introduction to forces, kinetics, equilibria, fluids, waves, and heat. This course presents concepts and methodologies for understanding physical phenomena, and is particularly useful preparation for upper division study in biology and architecture.</p> <p><b>Introductory Physics</b><br/> <b>Course Format:</b> Three hours of lecture and four hours of discussion/laboratory section per week.<br/> <b>Description:</b> Introduction to electricity, magnetism, electromagnetic waves, optics, and modern physics. The course presents concepts and methodologies for understanding physical phenomena, and is particularly useful preparation for upper division study in biology and architecture.</p>  |  |
|  | <p><b><u>Microbiology</u></b></p> <p>(Lecture; 1 semester or 1 quarter)</p> <p><b>General Microbiology</b><br/> <b>Course Format:</b> Three hours of lecture and one hour of discussion per week.<br/> <b>Description:</b> This course will explore the molecular bases for physiological and biochemical diversity among members of the two major domains, Bacteria and Archaea. The ecological significance and evolutionary origins of this diversity will be discussed. Molecular, genetic, and structure-function analyses of microbial cell cycles, adaptive responses, metabolic capability, and macromolecular syntheses will be emphasized.</p> <p><b>OR</b></p> <p><b>Public Health Microbiology</b><br/> <b>Course Format:</b> Three hours of lecture per week.<br/> <b>Description:</b> Introduction to properties of microorganisms; their relationships with humans in causing infectious diseases and in maintaining health. With lab, satisfies most requirements for a laboratory course in microbiology.</p> |  |
|  | <p><b><u>Immunology</u></b></p> <p>(Lecture; 1 semester or 1 quarter)</p> <p><b>Course Format:</b> Three hours of lecture and one hour of discussion per week.<br/> <b>Description:</b> Fundamentals of immunology with emphasis on biochemical and molecular approaches to study of the immune system and its application in medicine and</p> <p style="text-align: center;"><b>-next page-</b></p>   |  |

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|  | <p>biotechnology. Topics covered include description of the immune system, antibody and T-cell receptor structure and function, genes of the immunoglobulin superfamily, cells and molecular mediators that regulate the immune response, allergy, autoimmunity, immunodeficiency, tissue and organ transplants, and tumor immunology.</p>   |  |
|  | <p><b>Comparative or Human Anatomy</b><br/> <u><b>Anatomy</b></u><br/> (Lecture, lab preferred; 1 semester or 1 quarter)</p> <p><b>General Human Anatomy</b><br/> <b>Course Format:</b> Three hours of lecture per week.<br/> <b>Description:</b> The functional anatomy of the human body as revealed by gross and microscopic examination. Designed to be taken concurrently with lab.</p> <p><b>General Human Anatomy Laboratory</b><br/> <b>Course Format:</b> Four hours of laboratory per week.<br/> <b>Description:</b> Prepared human dissections, models, and microscopic slides.</p>   |  |
|  | <p><b><u>Human Physiology</u></b><br/> (Lecture and lab; 1 semester or 1 quarter)<br/> <b>Survey of Human Physiology (preferred)</b><br/> <b>Course Format:</b> Three hours of lecture per week.<br/> <b>Description:</b> Mechanisms by which key physiological priorities are maintained in healthy humans. From a basis in elementary theories of information and control, we develop an understanding of homeostasis of cellular composition, structure, and energy metabolism. We then study neural and endocrine signaling in humans, and develop the key concepts of control and homeostasis in all the major organ and multi-organ systems, including cardiovascular, respiratory, renal, metabolic, reproductive, and immune systems, growth and development, and sensory and motor systems. Mammalian Physiology Laboratory (preferred)<br/> <b>Course Format:</b> Three hours of laboratory per week.<br/> <b>Description:</b> In the laboratory component, students gain hands-on experience measuring physiological parameters, interpreting physiological data, designing experiments, and communicating ideas in writing and orally. Guided investigations include measurements of membrane potentials, responses of skeletal muscle to electrical stimulation, electromyography, pulmonary and cardiovascular measurements in humans, contractility and regulation of the frog heart, human electrocardiography, and renal control of body fluids. In two independent investigations, students identify their own questions, develop hypotheses, design and perform experiments, and present their studies in symposia. Background in elementary statistics, data analysis and oral presentation are also provided.</p> <p style="text-align: center;"><b>-next page-</b></p> |  |

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|  | <p><b>Physiology – Molecular and Cell Biology</b><br/> Three hours of lecture and one hour of discussion per week. Principles of mammalian (primarily human) physiology emphasizing physical, chemical, molecular and cellular bases of functional biology. The following topics will be covered: cellular and membrane ion and nonelectrolyte transport; cell and endocrine regulation; autonomic nervous system regulation; skeletal, smooth and cardiac muscle; cardiovascular physiology; respiration; renal physiology; gastrointestinal physiology. Discussion section led by Graduate Student Instructor will review material covered in lecture.</p> <p><b>Cell Biology and Physiology Lab</b><br/> One hour of lecture and seven hours of laboratory per week. Experimental analyses of central problems in cell biology and physiology using modern techniques, including DNA cloning and protein biochemistry, fluorescence microscopy of the cytoskeleton and organelles, DNA transfection and cell cycle analysis of cultured mammalian cells, RNA interference and drug treatments to analyze ion channel function in cell contractility and intracellular signaling, and somatosensation.</p> |  |
|  | <p><b>Calculus/Mathematics</b><br/> (Lecture only; 1 semester or 1 quarter)</p> <p><b>Calculus (preferred)</b><br/> <b>Course Format:</b> Three hours of lecture and two hours of discussion/workshop per week; at the discretion of the instructor, an additional hour of discussion/workshop or computer laboratory per week.<br/> <b>Description:</b> This sequence is intended for majors in engineering and the physical sciences. An introduction to differential and integral calculus of functions of one variable, with applications and an introduction to transcendental functions.</p> <p><b>OR</b></p> <p><b>Analytic Geometry and Calculus Course</b><br/> <b>Format:</b> Two hours of lecture and one hour of discussion/workshop per week; at the discretion of the instructor, an additional one hour to one and one-half</p>   |  |
|  | <p><b>Statistics</b><br/> (Lecture only; 1 semester or 1 quarter)</p> <p><b>Statistical Inferences for Social and Life Scientists</b><br/> <b>Course Format:</b> Three hours of lecture and two hours of laboratory per week.</p> <p style="text-align: center;"><b>- next page-</b></p>   |  |

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|  | <p><b>Description:</b> Ideas for estimation and hypothesis testing basic to applications. Linear estimation and normal regression theory.</p> <p><b>Introduction to Probability and Statistics in Biology and Public Health</b></p> <p><b>Course Format:</b> Three hours of lecture and two hours of discussion per week.</p> <p><b>Description:</b> Descriptive statistics, probability, probability distributions, point and interval estimation, hypothesis testing, chi-square, correlation and regression with biomedical applications.</p>   |  |
|  | <p><b><u>Psychology</u></b><br/>(Lecture only; 1 semester or 1 quarter)</p> <p><b>General Psychology</b></p> <p><b>Course Format:</b> Two hours of lecture and one hour of discussion per week.</p> <p><b>Description:</b> Introduction to the principal areas, problems, and concepts of psychology. This course is required for the major.</p> <p><b>Principles of Psychology</b></p> <p><b>Course Format:</b> Three hours of lecture per week.</p> <p><b>Description:</b> An overview of psychology for students who will not major in the field. This course satisfies the prerequisite for upper division decade courses.</p>   |  |
|  | <p><b><u>Reading and Composition</u></b><br/>(Lecture only; 2 semesters or 3 quarters)</p> <p><b>1. Reading and Composition Course</b></p> <p><b>Format:</b> Three hours of lecture per week.</p> <p><b>Description:</b> Training in writing expository prose.</p> <p>A. Instruction in expository writing in conjunction with reading literature. Satisfies the first half of the Reading and Composition requirement.</p> <p>B. Further instruction in expository writing in conjunction with reading literature. Satisfies the second half of the Reading and Composition requirement.</p> <p><b>2. Reading and Composition Course</b></p> <p><b>Format:</b> Three hours of lecture per week.</p> <p><b>Description:</b> Training in writing expository prose.</p> <p>A. Instruction in expository writing in conjunction with reading literature. Satisfies the first half of the Reading and Composition requirement.</p> <p>B. Further instruction in expository writing in conjunction with reading literature. Satisfies the second half of the Reading and Composition requirement.</p> |  |