BIOLOGY: BIOLOGICAL SCIENCE, B.S.

2014-2015

MAJOR REQUIREMENTS (105 UNITS)

Grades of "C" or better required. Courses may not need to be completed in order listed.

FALL WINTER SPRING

Biology core (63 units)

- BIOL 111 General Biology I (4) & BIOL 111L Laboratory (1) *Theme IVA**
- BIOL 111A General Biology Seminar (0)
- BIOL 112 General Biology II (4) & BIOL 112L Laboratory (1) *Theme IVA* Prerequisite: BIOL 111, 111L, 111A*
- BIOL 113 General Biology III (4) & BIOL 113L Laboratory (1) *Theme IVA* Prerequisite: BIOL 112 & 112L*
- BIOL 276 Research Processes in Biology (3) *Prerequisite: BIOL 113 & 113L*
- BIOL 376 Biostatistics (4) *Prerequisite: BIOL 113 & 113L*
- BIOL 301 Cell and Molecular Biology (4) *Prerequisite: BIOL 113, 113L, CHEM 271* & BIOL 301L Laboratory (1) *Prerequisite: BIOL 223*
- BIOL 302 Genetics (4) & BIOL 302L Laboratory (1) *Prerequisite: BIOL 301 & 301L*
- BIOL 303 Developmental Biology (4) & BIOL 303L Laboratory (1) *Prerequisite: BIOL 302 & 302L*
- BIOL 350 Colloquium (0) *Prerequisite: BIOL 113 & 113L*
- BIOL 405 Biology Seminar (2) *Prerequisite: BIOL 113 & 113L and BIOL 223*

Biological Science emphasis

Prerequisite: BIOL 113 & 113L

- BIOL 414 General Ecology (4) *or* BIOL 415 Environmental Science (4)
- BIOL 467 Herpetology (4) *or* BIOL 477 Vertebrate Natural History (4) *or* BIOL 408 Biology of Marine Invertebrates (4)
- Choose 16 units of electives from the following:
  - BIOL 385 Medicinal Plants
  - BIOL 408 Biology of Marine Invertebrates
  - BIOL 410 Science at the Cutting Edge
  - BIOL 434 Histology
  - BIOL 436 Immunology
  - BIOL 439 Neurobiology
  - BIOL 446 Human Gross Anatomy
  - BIOL 448 Neuroanatomy
  - BIOL 461 Virology
  - BIOL 466 Systems Physiology
  - BIOL 469 Animal Behavior
  - BIOL 474 General Microbiology
  - BIOL 485 Systematic Botany
  - BIOL 486 Marine Biology
  - BIOL 487 Field Study in Biology
  - BIOL 490 Bioinformatics
  - Any upper division course taught at Rosario Beach Marine Station

Required cognates (46 units)

- CHEM 111 General Chemistry I (4) & CHEM 111L Laboratory (1) *Theme IVB* Prerequisite: MATH 121 eligibility, CHEM 110 or placement*
- CHEM 112 General Chemistry II (4) & CHEM 112L Laboratory (1) *Theme IVB* Prerequisite: CHEM 111 & 111L*
- CHEM 113 General Chemistry III (4) & CHEM 113L Laboratory (1) *Theme IVB* Prerequisite: CHEM 112 & 112L*
- CHEM 271 Organic Chemistry I (3) & CHEM 271L Laboratory (1) *Prerequisite: CHEM 113 & 113L*
- CHEM 272 Organic Chemistry II (3) & CHEM 272L Laboratory (1) *Prerequisite: CHEM 271 & 271L*
- CHEM 273 Organic Chemistry III (3) & CHEM 273L Laboratory (1) *Theme IVA* Prerequisite: CHEM 272 & 272L*
- MATH 131 Calculus I (4) *Prerequisite: MATH 122*
- PHYS 231 General Physics I (4) & 231L Laboratory (1) *Theme IVB* Prerequisite for PHYS 231A: MATH 122; for 231B: MATH 132*
- PHYS 232 General Physics II (4) & 232L Laboratory (1)*Theme IVB* Prerequisite for PHYS 232A: 231A & 231L; for 232B: 231B & 231L*
- PHYS 233 General Physcis III (4) & 233L Laboratory (1) *Theme IVB* Prerequisite for PHYS 233A: 232A & 232L; for 233B: 232B & 232L*

UNIVERSITY STUDIES FOUNDATIONAL STUDIES (19-37 UNITS)

Grades of "C" or better required.

I	**FIRST-YEAR SEMINAR**	UNST 101A (1) and 101B (1) *or* UNST 100A (3) and 100B (3)
II	**RHETORICAL SKILLS**	A. ENGL 111 (3), 112 (3), 113 (3) College Writing *or* ENGL 124 Freshman Seminar (4)
		B. BIOL 301L (1), 302L (1), 303L (1), and 405 (2) as required by major
III	**MATHEMATICS**	College-level Mathematics course (4) *MATH 131 required by major*
IV	**WORLD LANGUAGES**	Level 3 proficiency (e.g. 153) in one non-English language (4-12)
V	**HEALTH AND FITNESS**	HLSC 120 Lifetime Fitness (2)

UNIVERSITY STUDIES GENERAL STUDIES (52 UNITS, 20 UPPER DIVISION)

Grades of "D" or better required, unless courses are required by major.

THEME	**IA**	Understanding Human Beings *or* **IB** Humans as Thoughtful Global Citizens
	IC	Globalization, Identity and Citizenship (SSCI 204 / 205 / 206 / 207) *Prerequisite: ENGL 113/124*
THEME	**IIA**	History and Appreciation of Visual and Performing Arts
	IIB	Historical or Contemporary Culture and Context
	IIC	Exploring Culture (HUMN 104 / 105 / 106) *Prerequisite: ENGL 111/124*
THEME	**III**	Any Theme III course (Theme III A, B, C, or D)
	IIIB	Beliefs and Heritage RELT 104 / 106 / 245 or RLGN 304
	IIIC	Scripture
	RLGN	RLGN 304 Adventism in Global Perspective or RLGN 305 Religion in Three Cultures (4) *Prerequisite: ENGL 113/124, Junior*
THEME	**IVA**	Life Science (4) *May be fulfilled by major requirements*
	IVB	Physical Science (4) *May be fulfilled by major's cognates*
	IVC	Scientific Foundations (NSCI 404 / 405 / 406 / 407) (4) *Prerequisite: ENGL 113/124, Theme IVA/Theme IVB, F3 Mathematics*
THEME	**V**	Senior Seminar: UNST 404B Religion, Values, and Social Responsibility (4) *Prerequisite: ENGL 111/124, Junior*

UNIVERSITY STUDIES SERVICE-LEARNING (3 courses)

**A maximum of 4 units from the Major, and 8 units of Cognates required by the Major, may apply to University Studies General Studies requirements (2014-2015 Undegraduate Academic Bulletin p. 71).*

NOTES: A course with quarters marked by [brackets] indicate the quarters in which that course is usually offered. Should a student's general education and major degree program not meet the minimum 190 units required for graduation, the student must complete elective units to make up the defiency.

BIOLOGY: BIOLOGICAL SCIENCE

B.S. Degree

The objectives of the Department of Biology are to help students better understand themselves and the living things around them, to develop a scholarly approach to the study and evaluation of scientific information, and to prepare for careers in biology, medicine and environmental sciences. The department is committed to providing students with research opportunities intended to result in poster presentations at scientific meetings and/or publications in peer-reviewed journals. The faculty offers mentoring and collaboration to qualified, highly motivated students who seek research opportunities in faculty laboratories. Interested students are encouraged to discuss research opportunities with individual faculty members.

CAREER OPPORTUNITIES AND RELATED OCCUPATIONS: Biology graduates are employed in a broad variety of government and private sector positions including, but not limited to field positions (forest service, park service, fish and wildlife management, conservation, ecology), agriculture research or management, food manufacturing industries, waste management, environmental safety and testing, industrial quality control, pharmaceutical and immunochemical industries, biotechnology (genetic engineering, molecular biology, microbiology, immunology), health related research (cancer, infectious disease, genetics), health professions (medicine, dentistry, optometry, allied health, public health), and teaching at the secondary and college levels.

EDUCATIONAL QUALIFICATIONS: Biological technicians typically need a bachelor's degree in biology or a closely related field. Students seeking employment in dentistry, veterinary medicine, or other medical fields must graduate from an accredited health professional school and complete any applicable internships/residencies.

JOB OUTLOOK: Employment of biological technicians is projected to increase 10 percent from 2012 to 2022, about as fast as the average for all occupations.

SALARY: The median annual wage of biological technicians was $39,750 in May 2012. The lowest 10 percent earned less than $25,280, and the top 10 percent earned more than $64,880.

Career information adapted from
U.S. Department of Labor, Bureau of Labor Statistics. (2012). *Occupational Outlook Handbook*. Retrieved from http://www.bls.gov/ooh.

ADDITIONAL INFORMATION

Websites

La Sierra University
www.lasierra.edu

Department of Biology
www.lasierra.edu/biology

Faculty

Chair
John Perumal, Ph.D.

Advisors
Natasha Dean, Ph.D.
Raul Diaz, Ph.D.
Lee Grismer, Ph.D.
Eugene Joseph, Ph.D.
John Perumal, Ph.D.
Nathaniel Sutter, Ph.D.
Lloyd Trueblood,Ph.D
James Wilson, Ph.D.

Location and Contact Information

Price Science Complex (PSC) 201
(951) 785-2105
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Professional Organizations

American Institute of Biological Sciences
Suite 200, 1444 I St. NW
Washington, DC 20005
www.aibs.org

American Society for Biochemistry and Molecular Biology
9650 Rockville Pike
Bethesda, MD 20814
www.faseb.org/asmb

La Sierra UNIVERSITY

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