APPLIED SCIENCE

Kevin Johnson, Director, School of Natural Sciences

The Applied Science major leads to a well-rounded, cross-disciplinary degree in science, well-suited for students seeking technical employment in areas where a cross-disciplinary background in science is desirable. The major also offers good preparation for students entering certain health related fields. Applied Science may be appropriate for students interested in teaching Middle School or High School science with an Integrated Science endorsement; interested students should consult with the College of Education about additional requirements.

Program Learning Outcomes
A student completing a major in Applied Science shall demonstrate the ability to:

- Demonstrated competency with fundamental quantitative methods and tools
- Demonstrated foundational proficiency in using computer technology
- Have intermediate knowledge and application experience in at least two areas of the Natural Sciences
- Be able to communicate scientific ideas in both written and oral formats.

Applied Science: Requirements for the Major

Two minors from among the following:

- Applied Physics
- Biology
- Chemistry
- Computer Science
- Environmental Science
- Exercise Science
- Mathematics

<u>One of the following:</u>

MATH 207	General Elementary Statistics	4 credits
MATH 226	Calculus I	4 credits

<u>One of the following:</u>

CS 150	Introduction to Computer Science I	4 credits
CS 130 and CS 230	Software Tools	4 credits
MATH 301	Mathematical Modeling	4 credits

At least 28 credits of courses numbered 300 or higher from among BIOL, CHEM, CS, EXIP, ENV (Science courses only), MATH, PHY. These courses should be selected to meet specific career or interdisciplinary goals and require approval of the Natural Sciences Division curriculum committee (currently, department chairs from the above mentioned departments). No more than 4 credits of internship may be counted <u>toward this total.</u>

<u>One of the following</u>:	Senior Capstone	2-6 credits

SCI 490 or a Capstone within one of the departments of your selected minors

COURSES

SCI-155 Special Topics
Go to https://www.pacificu.edu/about-us/centers-institutes/advising-center/new-topics-travel-class-descriptions or see the Advising Center.

SCI-170 Astronomy
A survey of astronomy, including the solar system, stars and stellar evolution, galaxies, cosmology, astronomical instruments, and space science. Evening observing sessions. 4 credits.

SCI-172 Introduction to Cosmology
Recent discoveries in astronomy are shedding light on some of the biggest questions we can ask: Does space go on forever, or does it have an end somewhere? Has the universe always existed, or did it have a beginning? Where does the matter that makes up our bodies come from? What will be the fate of our universe in the future? This course provides an overview of what science has to say about these kinds of questions, and an introduction to the methods used to gain this knowledge. Class discussions and assignments will help you develop your own personal perspective on how you connect to the big picture, guided by information from modern scientific cosmology. 2 credits.

SCI-190 Engineering Passport
An introduction to the fields of engineering, with an emphasis on the methods of problems solving and the nature of employment in these fields. Course activities include presentations, discussions, guest lectures, field trips, and problem-solving exercises. 1 credit.

SCI-200 Material Science for Makers
Through the lens of cultural values, this interdisciplinary course introduces students to relationships between art, craft, design, and science as applied to processes and materials used for the production of functional objects such as tools, tableware, and clothing. Throughout history, scientific and empirical approaches have been used outside of the laboratory by artisans and craftspeople to improve our food, tools, and shelters for the benefit of our health and well-being. In this course, students will use the scientific method in their work as they explore how science and culture inform and influence our choices and treatment of physical materials used to make the things we need. We will evaluate these choices for their utility and investigate the materials and processes of making using the scientific frameworks of physics and chemistry. We will also assess methods of production while considering issues of sustainability and environmental stewardship. Using Japanese culture as a unifying thread through lecture, reading, written reflection, and hand's on making, students will explore attitudes towards consumption and the science behind the processes of making objects of use in indigenous, traditional, and industrial cultures. Through the course of the semester, students will complete a simple sheath knife, a raku tea bowl, and a shibori-dyed article of clothing. The course will be team taught by faculty from both the School of Natural Sciences and the School of Humanities. Corequisite: HUM 200. 2 credits.

SCI-255 Special Topics
Go to https://www.pacificu.edu/about-us/centers-institutes/advising-center/new-topics-travel-class-descriptions or see the Advising Center.

SCI-355 Special Topics
Go to https://www.pacificu.edu/about-us/centers-institutes/advising-center/new-topics-travel-class-descriptions or see the Advising Center.

SCI-455 Special Topics
Go to https://www.pacificu.edu/about-us/centers-institutes/advising-center/new-topics-travel-class-descriptions or see the Advising Center.

SCI-475 Internship
See department for details. Internship contract required.

SCI-490 Applied Science Senior Capstone
Serves as the capstone course and project for students majoring in Applied Science. Students will design and complete a capstone project that includes independent study and analysis of experimental or scientific literature. Examples of acceptable projects include a focused review of the literature that results in an original interpretation of novel applications; a pedagogical project for students interested in pursuing a career in teaching; a project based on community service that uses innovative application of scientific principles and technology; an internship at a government laboratory or an industrial site. All projects culminate in a written paper, and public presentation. Prerequisite: Senior standing, declared Applied Science major, and 14 credits of relevant upper division coursework. Instructor's consent required. 2 credits.

SCI-495 Independent Study
See department for details. Independent study contract required.