

atdp

UC Berkeley
Academic Talent
Development Program

Which beam of light is moving faster:
a) that from the headlight of a parked car;
b) that from the headlight of a moving car;
c) that from the headlight of a moving spaceship;
d) all the beams are moving at c.

**SECONDARY
DIVISION**

for students completing
grades 7-11

JUNE 17 - JULY 26

2019

Berkeley
UNIVERSITY OF CALIFORNIA

Welcome to ATDP

January 2019

OVER THE PAST 38 YEARS, students have come to the UC Berkeley campus each summer to pursue architecture, literary analysis, law, precalculus, biotechnology, and so much more. Whether your family has a long tradition across generations at ATDP or whether you seek to join ATDP for the first time, *welcome*.

Over the decades, our mission has always remained the same: to enable all highly motivated and prepared students to pursue their academic passions through rigorous summer coursework in a community of like-minded peers. We offer courses appropriate to our students' needs, taught by outstanding public and private school instructors, as well as university researchers and industry professionals.

We also endeavor to learn more about academically talented students: how they develop, what they require in order to learn at their optimal pace and to their appropriate depth, and what factors support or impede their social development. Toward that goal, we sometimes ask our students and their families to participate in research studies and we solicit their insights and evaluations.

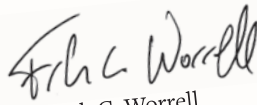
Our application process reflects our belief that students must be given the opportunity to present their strengths in a variety of ways. By requiring applicants to submit multiple indicators of their academic achievements, we are able to identify and admit a diverse group of the hardest-working, highest-achieving students. As you consider the wide range of classes offered in this year's catalog, we hope that you will find many that spark your interest.

Thank you for your interest in ATDP.

Sincerely,



Lisa Kala
Program Director



Frank C. Worrell
Faculty Director



PROGRAM OBJECTIVES

- To offer students an educational opportunity commensurate with their need to know, think, and express
- To help our students think and understand deeply
- To encourage students to rise rapidly through levels of study, seeking and meeting educational challenges as they grow
- To promote continued development of able young scholars toward a full educational and social life

LEARNER OUTCOMES

ATDP students will be able to...

- successfully complete rigorous and challenging coursework in a chosen discipline,
- pursue their academic passions and deep interests, and
- participate in an academic community of similarly motivated peers.

Contacting ATDP

EMAIL atdpoffice@berkeley.edu

WEB atdp.berkeley.edu

FACEBOOK facebook.com/ucb.atdp

PHONE 510-642-8308 *iSe habla español!*

FAX 510-642-0510

MAIL University of California, Berkeley
Academic Talent Development Program
Graduate School of Education
70 University Hall #1160
Berkeley, CA 94720-1160

Or drop by our office between 9:30 and 5; we welcome visitors!

University Hall is located at 2199 Addison St. in Berkeley.

PROGRAM DATES

June 17 to July 26, 2019
See back cover for important dates & deadlines

WEEKLY SCHEDULE

2 or 3 days per week
See course index, p. 4

DAILY SCHEDULE

Morning classes: 8:30 a.m. to noon
 Afternoon classes: 1:00 to 4:30 p.m.

LOCATION

UC Berkeley campus

FEES

Application processing fee: \$50
 (\$80 for international students)
 5-unit courses: \$650 - \$800
 10-unit courses: \$950 - \$1100

DISCOUNTS

Sibling discount: \$35 per sibling attending
 Limited need-based financial aid is available
See p. 15 for details

ATDP's **Secondary Division**, administered through UC Berkeley's *Graduate School of Education*, offers challenging courses to highly motivated students who have completed Grades 7-11 (and are entering Grades 8-12). Students are invited to attend the program on the basis of exceptional academic talent.

Classes are held in buildings across the UC Berkeley campus, including Berkeley Way West: the home of the Graduate School of Education at 2121 Berkeley Way.

ATDP's course offerings cover a wide variety of disciplines. Instruction is fast-paced, and expectations are high—each six-week course is designed either to cover a semester's worth (5 units, or 7.5 school days per class session) or a year's worth (10 units, or 10 school days per class session) of material. The number of hours of homework per ATDP class session is commensurate with the number of school days that the class covers and is provided below each course description on pp. 5-13.

ATDP is committed to supporting gender, ethnic, and socioeconomic diversity in all of its programs.

WHO ARE ATDP STUDENTS?

ATDP's goal is to select students who will benefit from the challenging course offerings and will succeed in this fast-paced program. Students are eligible to attend ATDP's Secondary Division once they complete Grade 7 and can apply each summer through the completion of Grade 11. Students become ineligible for ATDP when they complete Grade 12.

On average, admitted students have scored in the advanced range on the California Standards Test (CST) or above the 90th percentile on a nationally standardized achievement test in both mathematics and English Language Arts or reading. Additionally, ATDP students tend to earn an overall academic grade point average (GPA) of at least 3.5 on an unweighted 4-point scale. Please remember that these are not hard-and-fast selection criteria, but

SEE ALSO:


ELEMENTARY DIVISION

For students completing **Kindergarten** through **Grade 6**, ATDP offers an exciting three-week program at Washington School in **Point Richmond** (9 miles NW of UC Berkeley).

July 8 - July 26, 2019

atdp.berkeley.edu/ed

All classes meet Mondays, Tuesdays, Thursdays and Fridays. Extended care options available.



rather general guidelines. Designation as "gifted" at your home school is not required for admission to ATDP. Students with marks of "unsatisfactory" or "needs improvement" in conduct or citizenship are not a good fit for the program.

WHO ARE ATDP FACULTY?

Our faculty include exceptionally talented public and private school instructors, as well as university researchers and industry professionals. In addition to their excellence as classroom instructors, they share a serious commitment to the education of gifted and talented youth.

Inside

Courses **p. 2** **Attending** **p. 14** **Apply** **p. 18**

Courses & Credit Tuition & Payment Application Process
 Selecting a Course Transportation Deadlines & Notification
 Course Descriptions Policies & Preparation

COURSES



Unlike many other summer programs, ATDP offers courses that focus on acquisition of deep knowledge in a single topic. Secondary Division students are invited to immerse themselves and gain expertise in a subject that interests them. Some ATDP classes are designed to accelerate students through high school curricula. While ATDP does not provide credit for its courses, many high schools accept our recommendation of credit and will list ATDP classes on their transcripts.

Selecting a Course – p. 3

Course Index – p. 4

Course Descriptions – pp. 5-13

About ATDP Courses

SCHEDULE & SIZE

ATDP offers courses that meet either two or three days each week. Most run the full six weeks of the Secondary Division (June 17 - July 26), though a small number of 5-unit classes run on unique four-week schedules.

Classes generally have a cap of 20 to 24 students. The low teacher-to-student ratio, as well as the counseling and administrative staff support, ensure instruction of the highest quality.

Units	Meetings per week	Length	School workload equivalent
5	varies	6 wks.	1 semester (90 days)
5	3 (MWF)	4 wks.	1 semester (90 days)
10	3 (MWF)	6 wks.	2 semesters (180 days)

WORKLOAD

An ATDP course requires a serious time commitment. Students should expect to spend between three and ten hours preparing for each class meeting. The average number of hours of homework to expect per class meet-

Is the time listed for homework accurate, or is that just how long it takes other students who aren't as smart as I am?

The homework hours listed represent the average time to complete homework (not including studying) reported by the previous year's classes. It is safe to expect that the amount of homework you do will be somewhere within the range given.

ing is listed below each course description (pp. 5-13) and new students especially should expect to be spending time on homework that is at the upper end of the range provided.

CREDIT

ATDP *recommends* credit, but only the student's school may *grant* credit for an ATDP course. Only courses that have been placed by the high school on the student's high school transcript can be used to meet college entrance requirements. We mail a grade report to a student's school upon the student's request and only when credit is recommended. Any report that does not carry a credit recommendation is mailed only to the student's home. (See "Final Evaluation," p. 17.)

ATDP recommends high school credit for students who have demonstrated mastery of a

Will my school accept ATDP's recommendation of credit?

Many—but not all—high schools have accepted our recommendation in previous years. As school and district policies vary, make sure to check with your school's administration first if you hope to receive credit for an ATDP course.

Do ATDP courses count towards college entrance requirements?

If your school has accepted ATDP's recommendation of credit, it should appear on your high school transcript and will count towards college entrance requirements.

course with a grade of A or B. For grades of C and below, we assign a Pass or No Pass mark with no credit recommendation. An ATDP course can be considered for honors-level credit. Advanced Placement courses at ATDP are identified as such in their titles and should also carry appropriate credit.

Please check with your principal or guidance counselor before applying if credit is a concern.

EXPLORATIONS

In addition to its regularly scheduled courses, ATDP offers through its Explorations program a selection of optional classes, workshops, and trips. These activities enrich Secondary Division students' summer experience with opportunities to learn new skills, to pursue career-oriented interests, and to visit interesting places. Last year's Explorations included series in SAT preparation, mobile app programming, and journalism, as well as single-day options such as CPR training, art workshops, and personal finance.

Explorations meet on various weekdays, often for a half-day. They vary in length and meet between one and six times. The Explorations program guide and enrollment form will be sent to students along with their notification of acceptance into ATDP. Only students currently enrolled in ATDP courses may attend Explorations.

Selecting a Course

With nearly 40 different courses to choose from, it is sometimes difficult for students to find the one course that is just right for them! We encourage you to read through the course descriptions (pp. 5-13) to carefully identify a course that interests you and for which you are academically prepared. It is important to note course prerequisites and grade level requirements when you are selecting your course choices, as not all courses are open to all students. In addition to selecting the course that you are most interested in taking, you may select up to three other courses as alternatives.

NEW COURSES FOR 2019

These courses have never been held at ATDP before, and demand for these spots may be very high. As applications are evaluated in the order completed, we strongly recommend applying early!

Algorithms and Data Structures (p. 7)

AI in the Economy (p. 10)

Advanced Robotic Engineering (p. 13)

RETURNING COURSES

These Secondary Division courses are back from hiatus, and may include revisions and updated curricula for this summer:

Second-Year Japanese (see p. 6)

Introduction to Geometric Thinking (p. 8)

Precalculus (p. 9)

Business & Finance (p. 11)

CHOOSING A WRITING COURSE

Applicants sometimes have trouble figuring out which writing course is most appropriate for their skill level, age, and grade. Aside from creative writing, all of our writing courses share very similar learning goals,

just at different levels. We recommend including all acceptable writing course alternatives on your application form. Based on your academic product, grade, age, and Letter of Interest, we will place you in the most appropriate class.

CHOOSING A MATH COURSE

Accelerated mathematics courses have rigid prerequisites and a special application process. These courses are marked with the ► symbol next to their descriptions on pages 8-9. See page 8 for details.

I didn't learn as much as I would have liked in my math class this year. Can I repeat a math class at ATDP that I have already taken at my regular school?

No, we do not allow ATDP students to repeat math classes. Instead, we suggest that you consider taking a 5-unit math elective for which you have completed the prerequisites or a course in another field of study.

ADVANCED PLACEMENT

Courses designated as "Advanced Placement" are especially rigorous 10-unit courses designed to prepare students for the AP exam in the subsequent spring. Take special note of these courses' prerequisites and anticipated homework time per class meeting.

May 6th graders apply to the Secondary Division?

Our Elementary Division offers courses for 6th graders: see our Elementary Division catalog or atdp.berkeley.edu/ed. New ATDP applicants who will be completing 6th grade in 2019 are not eligible for the Secondary Division. Returning ED students with very strong academic records who will be completing 6th grade are eligible to apply for *The Writing Process*, *Elements of Web Design*, *Foundations of Algebra*, and *Public Speaking*.

APPLYING FOR TWO COURSES

Only students with strong academic backgrounds are allowed to take two courses, and new Secondary Division students (including those who previously attended ATDP's Elementary Division) are less likely to be allowed to enroll in two courses. Remember that expectations are high in every ATDP course, and many former students have reported that taking two courses was more time-consuming than they expected. Add together the two courses' Estimated Weekly Hours listed on page 4 for an approximate time commitment.

If you are interested in enrolling in two courses, you must petition to do so in your Letter of Interest that accompanies your application. The petition should explain your summer plan: clearly identify your desired schedule of two courses, making sure their meeting times do not conflict, as well as any alternatives (single courses or other two-course combinations) in order of preference. Also describe how you plan to manage time commitments outside of class meetings. Successful petitions tend to be for two 5-unit courses, or one 10-unit course with a lower time commitment and one 5-unit course.

Please also consider Explorations (p. 2) if your goal is to plan a full day of activity.

I have only one course choice. Do I still have to list alternate classes on my application?

Each course you request represents a commitment on your part. If you would rather not come to the program than attend a course other than your first choice, you should request your first choice only.

Will I improve my chances of being placed in my first choice class if I don't list alternates?

No. We always start by attempting to place a student in his or her first choice and only look at the alternates if the class is filled or if a student's application is not competitive for his or her first choice.



COURSE INDEX

See details for each course and course section in their respective descriptions on pp. 5-13.

Updates can be found at atdp.berkeley.edu/sd/catalog.

DEPT.	COURSE NAME	REQUIREMENTS ¹	EW ²	SCHEDULE ³	TOTAL FEE
WRITING & LITERATURE	The Writing Process	6 7 8 9 10 11	16	TuF, AM/PM	\$650
	Reading for Creative Writing	6 7 8 9 10 11	14	TuTh, AM only	\$650
	Crafting Effective Essays	6 7 8 9 10 11	18	MTh; AM/PM	\$650
	Analytical Writing	6 7 8 9 10 11	18	MTh, AM/PM	\$650
	Advanced Creative Writing	6 7 8 9 10 11	14	TuF, PM only	\$650
	Advanced Literary Analysis	6 7 8 9 10 11	24	MTh, PM only	\$650
FINE ARTS	Fundamentals of Art	6 7 8 9 10 11	18	TuTh, AM only	\$700
	Architectural Design	6 7 8 9 10 11	27	MWF, AM only	\$1000
LANG.	First-Year Japanese	6 7 8 9 10 11	27	MWF, AM only	\$950
	Second-Year Japanese	SEE PREREQS	30	MWF, PM only	\$950
COMPUTER SCIENCE	Elements of Web Design (TIC)	6 7 8 9 10 11	24	MWF, AM/PM	\$1100
	Introduction to Programming (Python)	6 7 8 9 10 11	18	TuTh, AM/PM	\$800
	Programming in Java	SEE PREREQS	30	MWF, AM/PM	\$1100
	Algorithms & Data Structures NEW	SEE PREREQS	18	TuTh, PM only	\$800
MATHEMATICS	Foundations of Algebra	6 7 8 9 10 11	16	TuTh, PM only	\$650
	Algebra I ⁴	SEE PREREQS ⁴	34	MWF, PM only	\$1000
	Introduction to Geometric Thinking	SEE PREREQS	16	TuTh, AM only	\$650
	Geometry ⁴	SEE PREREQS ⁴	40	MWF, AM/PM	\$1000
	Algebra II/Trigonometry ⁴	SEE PREREQS ⁴	34	MWF, PM only	\$1000
	Applied Mathematics ⁶	SEE PREREQS	22	MWF, AM only ⁶	\$650
	Precalculus ⁴	SEE PREREQS ⁴	34	MWF, PM only	\$1000
	AP Statistics	SEE PREREQS	33	MWF, AM only	\$1000
SOCIAL SCIENCES	Public Speaking (grades 6-8) ⁵	6 7 8 9 10 11	14	TuF, AM/PM	\$650
	Public Speaking (grades 9-11) ⁵	6 7 8 9 10 11	14	MTh, PM only	\$650
	Social Psychology	6 7 8 9 10 11	16	TuTh, PM only	\$650
	AI in the Economy NEW	SEE PREREQS	16	TuTh, PM only	\$650
	The Practice of Law	6 7 8 9 10 11	14	MTh, AM/PM	\$650
	Business & Finance ⁶	SEE PREREQS	14	TuWF, AM only	\$650
	Philosophy & Critical Thinking	6 7 8 9 10 11	14	TuF, PM only	\$650
	AP Psychology	6 7 8 9 10 11	30	MWF, AM only	\$950
NATURAL SCIENCES	Introduction to Biotechnology	6 7 8 9 10 11	18	TuTh, AM/PM	\$800
	Introduction to Engineering	6 7 8 9 10 11	14	TuTh, PM only	\$800
	Introduction to Chemistry	6 7 8 9 10 11	16	TuF, AM/PM	\$800
	Introduction to Astronomy & Astrophysics ⁶	SEE PREREQS	27	MWF, PM only ⁶	\$800
	Advanced Biotechnology ⁶	SEE PREREQS	33	MWF, AM/PM ⁶	\$800
	Advanced Robotic Engineering NEW	SEE PREREQS	26	MWF, AM only	\$1100
Cognitive Neuroscience	SEE PREREQS	26	MW/TuTh, PM only	\$650	

¹ = Open to this grade level

= **Recommended** grade level

SEE PREREQS = Denotes a course with requirements in addition to or instead of a grade level requirement. See course descriptions on pp. 5-13.

² **Estimated Weekly Hours** indicates the approximate time commitment *per week*, including class sessions, homework, and study, based on reports from previous years' students.

³ AM sessions meet 8:30 AM to 12:00 noon.

PM sessions meet 1:00 PM to 4:30 PM.

⁴ This is an accelerated math course with additional restrictions. Read its course description carefully. To apply, follow the instructions on page 8.

⁵ *Public Speaking* has sections divided by grade level. Section SD3950.1 & 50.2 meet on TuF and are open to students completing grades 6, 7, or 8 only. Section SD3950.4 meets on MTh PM and is open to students completing grades 9, 10, or 11 only.

⁶ *Applied Mathematics, Business & Finance, Introduction to Astronomy & Astrophysics, and Advanced Biotechnology* have compressed four-week schedules instead of the standard six-week Secondary Division schedule. See the individual course descriptions for the exact dates.

Each course is offered in one or more sections, listed on the following pages, as indicated at right (instructors listed as "Staff" are yet to be determined):

Course Title

Number Weekly Schedule Meeting Time Instructor



WRITING & LITERATURE

The Writing Process

SD3900.1 Tu & F 8:30 - 12:00 Tyleen Kelly

SD3900.2 Tu & F 1:00 - 4:30 Tyleen Kelly

This course is meant for students who are mastering their middle school writing skills and transitioning to high school. Students will investigate the purposes for which authors write and will become purposeful readers and writers. Lessons and activities will focus on the process of writing: pre-writing, drafting, editing, and revising. Students will work in editing groups, help each other revise drafts, and study the qualities of good writing. They will learn techniques for crafting well-written sentences, logical paragraphs, and coherent essays. Students will read, study, and discuss writing styles, and they will practice what they have learned in numerous writing assignments.

This course is recommended for students completing Grades 7 and 8.

Homework per class meeting: 2-5 hours

Recommended credit: 5 units

Tuition: \$650 (\$570 base tuition + \$80 facilities fee)

Reading for Creative Writing

SD3901 Tu & Th 8:30 - 12:00 Staff

This class will focus on reading critically and passionately and on fostering creative writing skills. Students will read poetry, short stories and other works of literature, and write responses to the readings. They will visualize the imagery and explore the themes of literature in relation to their own lives. For more inspiration, class activities may include drawing and art, campus explorations, and a visit to a local museum. Students will share their insights into the mind of the author and seek to understand their own writing processes. Through improvisation, class discussion, and writing exercises, students will learn to identify and experiment with various narrative techniques. They will develop a portfolio of their own creative writing and will also write one analytic essay that will reflect their growing expertise as readers and writers.

Grade Requirement: For students completing Grade 7 or 8.

Homework per class meeting: 2-4 hrs.

Recommended credit: 5 units

Tuition: \$650 (\$570 base tuition + \$80 facilities fee)



Crafting Effective Essays

SD3903.1 M & Th 8:30 - 12:00 Gabriella Wyatt

SD3903.2 M & Th 1:00 - 4:30 Gabriella Wyatt

This class will provide a vehicle for students to sharpen their high school level reading and writing skills. Students will mold facts, speculations, beliefs, and opinions into cogent, powerful statements. Through readings, class discussions, and group work, students will learn how to develop arguments to answer complex questions and then support their original claims with sufficient and significant evidence. From carefully constructed paragraphs to complete essays, successive assignments will allow students to investigate different approaches to their writing. Emphasis will be on learning to refine thinking and on improving writing through outlining, editing and rewriting.

This course is recommended for students completing Grades 8 and 9.

Homework per class meeting: 3-6 hrs.

Recommended credit: 5 units

Tuition: \$650 (\$570 base tuition + \$80 facilities fee)

Analytical Writing

SD3904.1 M & Th 8:30 - 12:00 Staff

SD3904.2 M & Th 1:00 - 4:30 Elizabeth Scherman

This course, taught at the advanced high school level, will allow students to strengthen their analytical reading and writing skills. Students will practice reading with care and will hold meaningful discussions about the texts they study, which may include visual texts as well as written texts. They will learn to incorporate critical thought and deep textual analysis to produce well-organized, well-written, well-developed, and intellectually complex essays. They will perform the stages of writing from clarification of the assignment to final revision, working on grammar, composition, and editing.

This course is recommended for students completing Grades 9 and 10.

Homework per class meeting: 3-6 hrs.

Recommended credit: 5 units

Tuition: \$650 (\$570 base tuition + \$80 facilities fee)



Advanced Creative Writing

SD3906 Tu & F 1:00 - 4:30 Alex Franklin

This course will focus on purposeful reading and developing advanced creative writing skills. Students will read short stories, poems, and a novel, discuss the form and purpose of meta-fiction, and revise their writing through class workshops before presenting their finished work. Students will revise and craft tone so that they can assure a reader, "This narrative came from a living, breathing, thinking being." In their clever meta-narratives, students will also learn to be mindful not to trample on the purpose, message or content of their stories.

Grade Requirement: For students completing Grade 9 and up.

Homework per class meeting: 2-4 hrs.

Recommended credit: 5 units

Tuition: \$650 (\$570 base tuition + \$80 facilities fee)

Advanced Literary Analysis

SD3908 M & Th 1:00 - 4:30 Staff

This is a course for people who enjoy literature and analytic discussion so much that they want to become superb at these activities. Students will be expected to tackle complex works of literature with relish—texts will include fiction and poems, leading up to a Shakespeare play. Students will work not only at their analytic essay writing, but also at leading discussion. We will emphasize close reading and precise writing, and from this students' own writing will emerge more fluidly with greater clarity and impact. The course is both preparation for reading literature in college and for doing well in AP English literature courses.

Grade Requirement: For students completing Grade 10 or 11.

Homework per class meeting: 2-5 hrs.

Recommended credit: 5 units

Tuition: \$650 (\$570 base tuition + \$80 facilities fee)





FINE ARTS

Fundamentals of Art

SD3911 Tu & Th 8:30 - 12:00 Staff

This course is a comprehensive, in-depth study of the fundamentals of the arts. Students will develop observational and drawing skills through the use of a variety of media and subject matter. We will be covering a range of techniques adaptable to any student level, using various media including pencil, ink, charcoal, pastel, watercolors, paint, collage and printmaking. Students will explore their imagination and creativity through the investigation of themselves in self-reflections and use the basic concepts of art as knowledge to develop their ideas. Students will create multiple projects that reflect the arts as a part of their lives, viewing art in perspectives and problem solving through expression to create art as a lifelong skill. This hands-on studio class involves group and individual instruction to encourage multiple ideas and creativity.

Grade Requirement: Open to all qualified SD students.

Homework per class meeting: 2-6 hrs.

Recommended credit: 5 units

Tuition: \$700 (\$570 base tuition + \$130 facilities fee)



Architectural Design

SD3915 M W F 8:30 - 12:00 Tania Osorio

This course introduces students to the variety of processes that revolve around architectural thought. The class focuses on learning the practice of design by observing the immediate context that surrounds the students' everyday life. While exploring the possibilities of architectural representation, students work to develop skills to address the challenges that imply re-imagining spaces. The overall purpose of this course is to offer students the basic knowledge to understand architecture as a means for their creative potential and their possible future professional career. The course consists of several assignments, including architectural drawings of existing buildings, abstract sculptural design, and designing new architectural structures. Knowing how to draw or build models is not a prerequisite.

Grade Requirement: For students completing Grade 8 and up.

Homework per class meeting: 3-6 hrs.

Recommended credit: 10 units

Tuition: \$1000 (\$850 base tuition + \$150 facilities fee)

Older high schoolers interested in architecture may also be eligible for **emBARC**, a summer program in UC Berkeley's College of Environmental Design. Visit ced.berkeley.edu/academics/summer-programs/ for more information.



LANGUAGES



First-Year Japanese

SD3923 M W F 8:30 - 12:00 Junko Hosoi

This course is based on a fun, playful, and effective approach to learning Japanese. This method is a synthesis of many innovative teaching techniques developed to help accelerate students' language learning. The two major components of this course are: (1) acquisition of basic communication skills of elementary Japanese and (2) learning hiragana and katakana syllabaries as well as some kanji characters. The language is taught multi-modally: lots of physical movement, use of pictures and graphics, conversation practices, storytelling, and some story creating. Students also learn about modern Japanese life. This course is equivalent to one year of high school Japanese.

Grade Requirement: Open to all qualified SD students.

Homework per class meeting: 3-6 hrs.

Recommended credit: 10 units

Tuition: \$950 (\$850 base tuition + \$100 facilities fee)

Second-Year Japanese

SD3924 M W F 1:00 - 4:30 Staff

Using a multi-modal approach, the class will begin where First-Year Japanese left off. The course will include a comprehensive review of katakana and kanji that students have already learned, and the introduction of much more kanji. Emphasis will be placed on consolidation of listening and speaking skills; the additional grammar and constructions will advance students' understanding even further. In addition to our focus on learning the language, students will learn about culture and customs in contemporary Japanese life. This course covers the full content of second-year high school Japanese.

Prerequisite: Completion of *First-Year Japanese*, or permission of the Director.

Grade Requirement: Open to all qualified SD students.

Homework per class meeting: 4-8 hrs.

Recommended credit: 10 units

Tuition: \$950 (\$850 base tuition + \$100 facilities fee)



COMPUTER SCIENCE



Access outside of class to a desktop or laptop computer (i.e. not a tablet, Chromebook, or mobile device) and to the Internet is required to complete homework for all computer science courses.

Elements of Web Design

The Internet Classroom

SD3933.1 M W F 8:30 - 12:00 Samuel Pierce

SD3933.2 M W F 1:00 - 4:30 Samuel Pierce

In this course, students will learn to combine computer code with graphic design to create their own websites. No programming experience is necessary; students begin with the concept of syntax and character encoding. They will become familiar with computer networks and file systems as they build standards-based web pages from the ground up using HTML and CSS. Students should be prepared to flex their creative muscles: coding topics will be balanced with a discussion of good visual design and layout, including digital graphics production and manipulation. They will also explore non-technical topics such as anonymity, intellectual property & copyright, journalism, social media, and yes: memes. This course provides the necessary foundation for students who want to continue on to contemporary web/mobile app development.

Grade Requirement: Open to all qualified SD students.

Homework per class meeting: 2-5 hrs.

Recommended credit: 10 units

Tuition: \$1100 (\$900 base tuition + \$200 facilities fee)



Interested in artificial intelligence?

Study how **AI in the Economy** is impacting the business world, p. 8.



Introduction to Programming

Solving Problems with Python

SD3934.1 Tu & Th 8:30 - 12:00 Staff

SD3934.2 Tu & Th 1:00 - 4:30 Staff

Students in this class will learn how to solve puzzles with computer programming. No prior programming experience is necessary. Using the Python language, students will write programs collaboratively like experts in the field, working in pairs and critiquing each other's programs. They will learn how to write programs that make decisions using conditional statements and interact with humans using loops and input/output. We will also talk and write about the ethical implications of technologies such as artificial intelligence and social media. Students will learn how to structure their thinking and write faster programs using the tools of algorithm and data structure design. At the end of this course, students will be able to put their logical thinking as well as their creativity to use to build relationships and tell stories with computers.

Prerequisite: None; completion of *Algebra I* is recommended.

Grade Requirement: Open to all qualified SD students.

Homework per class meeting: 3-6 hrs.

Recommended credit: 5 units

Tuition: \$800 (\$600 base tuition + \$200 facilities fee)



Programming in Java

SD3935.1 M W F 8:30 - 12:00 Anh Nguyen

SD3935.2 M W F 1:00 - 4:30 Anh Nguyen

This course will introduce students to object-oriented programming in Java. Programming experience is helpful but not necessary; students applying for this course must already feel comfortable with file systems, rules of syntax, and mathematical thinking, particularly the ideas of variables and functions. Students learn about object-oriented structures like classes very early in the course, along with basic Java syntax and graphics. Students will also learn how to process data structures like arrays and lists. Students will use searching and sorting algorithms to create powerful programs. Toward the end of the course, students will demonstrate their creative skills through various projects that explore advanced applications, such as graphical user interfaces, as well as their ability to write formal documentation.

Prerequisite: Completion of *Algebra I* required. Completion of an introductory computer science course recommended.

Grade Requirement: Open to all qualified SD students.

Homework per class meeting: 3-7 hrs.

Recommended credit: 10 units

Tuition: \$1100 (\$900 base tuition + \$200 facilities fee)

Algorithms and Data Structures

SD3938 Tu & Th 1:00 - 4:30 Aaron Brookner

NEW COURSE: This advanced programming course will introduce students to algorithms and their relationship to data structures, touching on several of the concepts covered in a second-year collegiate computer science curriculum. Students should already be familiar with control structures like conditionals, loops, and functions. We will develop a sense for designing algorithms and analyzing how fast they will run. We will start with one-dimensional structures and sorting algorithms, then move to more involved data structures like trees and graphs and their associated problems, such as shortest-path-finding and traversal. By focusing on creating fully-featured projects, we will combine our code with graphical user interfaces to create more powerful, efficient, and useful programs.

Prerequisite: Completion of *Programming in Java* or *AP Computer Science*, or a passing score on a placement test, or permission of the Director.

Grade Requirement: Open to all qualified SD students.

Homework per class meeting: 3-6 hrs.

Recommended credit: 5 units

Tuition: \$800 (\$600 base tuition + \$200 facilities fee)



MATHEMATICS



Foundations of Algebra

SD3940 Tu & Th 1:00 - 4:30 Claudia Benedetti

This course is designed to strengthen and develop skills that are essential for students who will be entering an Algebra I course in the fall. We will study strategies for problem solving, patterns and functions, probability, graphing, equations, properties, exponents and geometric thinking. During the six-week course, we will identify individual student curricular needs and then design instruction to challenge all students in the class. Students will approach problem-solving using a scientific approach: defining the problem, making predictions and hypotheses, testing assertions, using algebra to generalize from specifics, making conclusions and supporting them with logical argument and proof. Working with the Common Core Curriculum, proofs will entail writing the process of the solution in complete form, thus demonstrating students' mastery of the curriculum. This class is for students who have *not* taken Algebra I.

Grade Requirement: For students completing Grade 7 or 8.

Homework per class meeting: 2-5 hrs.

Recommended credit: 5 units

Tuition: \$650 (\$570 base tuition + \$80 facilities fee)

Algebra I

SD3942 M W F 1:00 - 4:30 Justine Song

This six-week course covers a full year of Algebra I and is aligned with Common Core standards for high school Algebra classes. Topics to be covered include patterns and graphs; writing and solving equations; numeric, geometric, and algebraic ratios; slopes and rates of change; linear functions and graphing; factoring quadratics and other polynomials; systems of linear equations and inequalities; radicals and exponents; rational and irrational numbers; and graphing quadratic functions and finding roots. Students frequently spend eight hours outside of class preparing for each class session. The atmosphere of the class is cooperative; the emphasis is on working together.

Prerequisite: Completion of *Pre-Algebra*, grade of A in current math class, Teacher Recommendation Form completed by current math instructor, and passing score on placement test.

Homework per class meeting: 5-8 hrs.

Recommended credit: 10 units

Tuition: \$1000 (\$850 base tuition + \$150 facilities fee)

Applying for an accelerated math course

If you are interested in taking an accelerated mathematics course (i.e., *Algebra I*, *Geometry*, *Algebra II*/*Trigonometry*, *Precalculus*: marked with the ► symbol), please note the following admissions requirements:

- You must have a grade of A in your current mathematics class, and a strong academic profile overall;
- You cannot repeat a math course you have already taken;
- Your *Teacher Recommendation Form* must be completed by your current mathematics teacher; and,
- You must take and pass the diagnostic examination given on the afternoon of Saturday, May 18, 2019.

As noted above, acceptance and placement into all accelerated mathematics courses is contingent upon successful passing of a

written diagnostic test. If you are unable to take the test on May 18, the acceptance letter will provide instructions on scheduling a date for a makeup test. Results will be mailed and posted online the week after testing.

Students who do not pass their placement test remain admitted to the program. We will work with these students to find a more suitable course placement. Please note that these additional admissions requirements pertain to students applying for accelerated mathematics courses only; they do not pertain to 5-unit math courses. Students in *Foundations of Algebra* **do** need to take the diagnostic test on May 18, but their score will have no effect on their final placement.

The diagnostic test is for placement purposes only. Families may be informed of a total percentage score as it relates to placement criteria, but detailed results will not be available.

Introduction to Geometric Thinking

SD3943 Tu & Th 8:30 - 12:00 John Ku

This course is designed for students who want to tackle selected topics from high school Geometry. The approach is informal, with hands-on activities that will allow students to explore geometric concepts. Through a variety of techniques such as cooperative learning, the discovery method, and model-making, students will dive into the major concepts of Euclidean geometry. Students will work together on a number of conceptual and applied projects such as constructing tessellations. This course will give students the confidence and background to engage at a high level with the coursework in the regular or honors Geometry courses at their schools in the fall.

Prerequisite: Completion of *Algebra I* or *Integrated Math I*.

Homework per class meeting: 2-5 hrs.

Recommended credit: 5 units

Tuition: \$650 (\$570 base tuition + \$80 facilities fee)

Geometry

SD3944.1 M W F 8:30 - 12:00 Philippe Henri

SD3944.2 M W F 1:00 - 4:30 Philippe Henri

This fast-paced course completes all topics of first-year Geometry: points, lines, planes, and angles; deductive reasoning; parallel lines and planes; congruent triangles; quadrilaterals; inequalities in geometry; similar polygons; right triangles; circles; constructions and loci; areas of plane figures; areas and volumes of solids; coordinate geometry; transformations; and an introduction to trigonometry. Because the course covers a full year of Geometry, students spend at least eight hours outside of class preparing for each class session.

Prerequisite: Completion of *Algebra I*, grade of A in current math class, Teacher Recommendation Form completed by current math instructor, and passing score on placement test.

Homework per class meeting: 6-10 hrs.

Recommended credit: 10 units

Tuition: \$1000 (\$850 base tuition + \$150 facilities fee)



Algebra II/Trigonometry ▶▶

SD3946 M W F 1:00 - 4:30 Toby Jaw

This extremely fast-paced course completes all topics of second-year Algebra with trigonometry: linear functions and relations; systems of linear equations and inequalities; quadratic functions and complex numbers; exponential and logarithmic functions; rational and irrational algebraic functions; quadratic relations and systems; higher degree functions and polynomials; sequences and series; graphing techniques; circular and trigonometric functions; and use of mathematical models for applications and problem solving. Because the course covers a full year of material, students spend a great deal of time outside class preparing for each class session.

Prerequisite: Completion of *Geometry*, grade of A in current math class, Teacher Recommendation Form completed by current math instructor, and passing score on placement test.

Homework per class meeting: 5-8 hrs.

Recommended credit: 10 units

Tuition: \$1000 (\$850 base tuition + \$150 facilities fee)

Applied Mathematics *Understanding Higher Math through Physics and Tinkering*

SD3947 M W F 8:30 - 12:00 Kaushik Basu

NOTE: This course has a **four-week** schedule. It starts **July 1** and ends **July 26**.

Have you wondered how much gas you would save if the highway speed limit were dropped to 55 miles per hour? Would you imagine that dropping paper cones may have some bearing to that question? In this course we will explore mathematical descriptions of objects in the real world through hands on projects. Students will build models using cardboard and paper to prove mathematical theorems. We will learn to use approximations effectively, and discover how they lead to the study of calculus in a natural way. We will also learn trigonometry and vectors, as well as a technique called dimensional analysis, which blends physics into algebra. Students will discover how to compute the volumes of unusual geometric objects using Cavalieri's Principle, and use origami folding to shed new light on conic sections. We will test our mathematical results along the way by considering their physical meaning in extreme, and hopefully absurd, situations. In the process, we will get a sense of how numbers are used in science, as well as how physics inspires new mathematical ideas.

Prerequisite: Completion of *Algebra II* or *Integrated Math III*.

Homework per class meeting: 2-4 hrs.

Recommended credit: 5 units

Tuition: \$650 (\$570 base tuition + \$80 facilities fee)



Precalculus ▶▶

SD3948 M W F 1:00 - 4:30 Denny Gillingham

This fast-paced course completes all topics necessary for success in Calculus: elementary functions including inverses and transformation theory; polynomial and rational functions and their graphs; exponential and logarithmic functions; trigonometric functions of real numbers, graphs of the trigonometric functions and their inverses; trigonometric functions of angles; analytic trigonometry, identities; polar coordinates and vectors including polar graphing, polar form of complex numbers, DeMoivre's Theorem, roots of unity; analytic geometry, conic sections including rotation of axes, polar equations of conics, parametric equations; sequences, series, sigma notation; proof by mathematical induction; introduction to limits; introduction to differentiation. The course emphasizes conceptual understanding, technical skills, and the use of technology to use mathematics to model the real world.

Prerequisite: Completion of *Algebra II* or *Integrated Math III*, grade of A in current math class, Teacher Recommendation Form completed by current math instructor, and passing score on placement test.

Homework per class meeting: 5-8 hrs.

Recommended credit: 10 units

Tuition: \$1000 (\$850 base tuition + \$150 facilities fee)



Advanced Placement Statistics

SD3949 M W F 8:30 - 12:00 Staff

Statistics is perhaps the most widely applicable branch of mathematics, and coursework will often use real-world data. The class is equivalent to a one-semester, introductory, non-calculus-based college course in statistics and will prepare students for the AP Statistics examination in May 2020. Guided by the AP Statistics syllabus, this course will introduce students to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. There will be four themes: exploring data, sampling and experimentation, anticipating patterns, and statistical inference. Students will use technology, investigations, problem solving, and writing as they build conceptual understanding and become fluent with the language and formulas of statistics. In class, students will use graphing calculators that have extensive statistical capabilities, and students will be expected to bring a graphing calculator with statistical capabilities to the AP exam.

Prerequisite: Completion of *Algebra II* or *Integrated Math III*, grade of A in current math class, and Teacher Recommendation Form completed by current math instructor.

Grade Requirement: For students completing Grade 9 and up; completion of 10th grade recommended.

Homework per class meeting: 4-8 hrs.

Recommended credit: 10 units

Tuition: \$1000 (\$850 base tuition + \$150 facilities fee)





AI in the Economy

The Business and Financial Impacts of Artificial Intelligence

SD3956 Tu & Th 1:00 - 4:30 David Powell

NEW COURSE: Artificial intelligence has rapidly emerged as a key driver of business, economic opportunity, and competition. As a natural extension and evolution of key computing technologies, AI today reaches deeply into our networked ecosystem, including our search engines and social media. Students will investigate how these technologies have been responsible for reshaping business, social norms, and economic prosperity. This course will provide a condensed “deep dive” into AI, culminating in a capstone portfolio project that will provide students with the opportunity to demonstrate their understanding, knowledge, creativity and insights into the current and future impacts of AI.

Grade Requirement: For students completing Grade 8 and up.

Homework per class meeting: 2-5 hrs.

Recommended credit: 5 units

Tuition: \$650 (\$570 base tuition + \$80 facilities fee)

The Practice of Law

SD3958.1 M & Th 8:30 - 12:00 Gary Kitajo

SD3958.2 M & Th 1:00 - 4:30 Gary Kitajo

This course will provide an overview of social institutions and functions addressed in the practice of law. Students will participate in each of the lawyer’s roles: investigation, research, advocacy, trial preparation, and dispute resolution. In the process, students will examine the nature and history of law, interrogate parties, argue hypothetical cases, and draft legal pleadings and documents. This class requires active participation in lively classroom activities and projects, which include simulated trials, oral argument, and case briefing. Students are encouraged to participate freely in robust classroom discussions and debates, with a premium placed on the open exchange of ideas and opinions. The course will culminate in a mock trial, conducted in a courtroom setting before a presiding judge.

Grade Requirement: For students completing Grade 8 and up.

Homework per class meeting: 2-4 hrs.

Recommended credit: 5 units

Tuition: \$650 (\$570 base tuition + \$80 facilities fee)

Public Speaking

SD3950.1 Tu & F 8:30 - 12:00 Elizabeth Scherman

SD3950.2 Tu & F 1:00 - 4:30 Laura Shefler

SD3950.4 M & Th 1:00 - 4:30 Laura Shefler

Students in this course will develop the writing and performance skills needed to become clear, compelling, confident, and persuasive public speakers. We will practice a variety of speaking styles, including impromptu (speaking “off the cuff” with minimum preparation time), dramatic interpretation (of monologues from novels, plays, and films), debate (defending a position on a controversial issue), and oratory (a formal speech that seeks to inform, inspire, or persuade on a topic of your choice). We will also study, view, and analyze the performances of some of the most powerful orators of the past century. If you are seeking to reduce your anxiety about public speaking, this course provides a friendly, nonthreatening environment in which to increase your confidence. If you already enjoy public speaking, you will have an opportunity to enhance and practice your skills.

Tu & F Sections (SD3950.1 & 50.2): For students completing Grades 6, 7, or 8 only.

M & Th Section (SD3950.4): For students completing Grades 9, 10, or 11 only.

Homework per class meeting: 2-4 hrs.

Recommended credit: 5 units

Tuition: \$650 (\$570 base tuition + \$80 facilities fee)

Social Psychology

SD3952 Tu & Th 1:00 - 4:30 Cyrell Roberson

Social psychology is the scientific study of the way people think about, feel, and behave in social situations. It involves understanding how people influence, and are influenced by, others around them. A primary goal of this course is to introduce you to the perspectives, research methods, and empirical findings of social psychology. We will use a college-level textbook along with supplementary readings to cover topics including: impression formation, conformity, pro-social behavior, interpersonal attraction, persuasion, stereotyping and prejudice. Equally important is the goal of cultivating your skills for analyzing the social situations and events that you encounter in your everyday lives. Finally, throughout the course, emphasis will be placed on developing critical and integrative ways of thinking about theory and research in social psychology.

Grade Requirement: For students completing Grade 8 and up.

Homework per class meeting: 2-5 hrs.

Recommended credit: 5 units

Tuition: \$650 (\$570 base tuition + \$80 facilities fee)



Already mastered speaking in English?

Check out our **Japanese** language classes on p. 6.



Business & Finance

SD3959 Tu & F 8:30 - 12:00 Jennifer Lyons



NOTE: This course has a **four-week** schedule. It starts **June 17** and ends **July 12**.

This course is a concentrated, practical and exciting introduction to business for high school students. Students will explore fundamental principles of finance and economics, including the basics of valuation, risk and return, and demand and supply. The course will emphasize real-world application through applied problems and projects. We will study how firms make decisions, the role of banks and markets, and we will explore timely macroeconomic topics such as government debt and deficits, currency fluctuation, recession, and financial and currency crises. Throughout, students will increase their financial literacy and gain tools for personal financial planning for college and beyond, including how interest accumulates, the pitfalls of credit, and understanding residential mortgage terms and risks. Students will find that the connections between these topics and the mathematical concepts they have learned in school will make their math classes more interesting and relevant.

Prerequisite: Completion of *Algebra II* or *Integrated Math III*.

Homework per class meeting: 2-4 hrs.

Recommended credit: 5 units

Tuition: \$650 (\$570 base tuition + \$80 facilities fee)

Philosophy & Critical Thinking

SD3960 Tu & F 1:00 - 4:30 Alexander James

This course is an introduction to the interrelated fields of philosophy and critical thinking. Philosophy is the exploration of the fundamental questions of existence, life, and reality, aiming to reconcile our understanding of things from various domains. Philosophers seek to address philosophical problems, such as the problem of free will or the problem of consciousness, and construct philosophical systems that enable us meaningfully to organize our knowledge. Critical thinking is the activity of taking a critical look at our beliefs, and at the method by which we form and justify these beliefs and convey them—in writing, speech and debate—within a community of knowers and inquirers. Critical thinking offers guidance in logic and reasoning, and helps us gain awareness of the ways in which we can be led astray in the search for truth. The study of philosophy and critical thinking provides students with the resources and experience to become deeper and clearer thinkers and more capable writers, learners and researchers.

Grade Requirement: For students completing Grade 8 and up.

Homework per class meeting: 2-4 hrs.

Recommended credit: 5 units

Tuition: \$650 (\$570 base tuition + \$80 facilities fee)



Advanced Placement Psychology

SD3961 M W F 8:30 - 12:00 Dante Dixon

This course provides a rigorous introduction to the fundamental concepts in psychology and prepares students for the May 2020 AP examination in psychology. Topics include the neurological processes that lead to thought and behavior, the processes that allow people to sense and perceive information from the environment, sleep and dreams, behavior, sources of the motivation to act, emotional experiences, language, memory, human development across the lifespan, personality, psychological disorders, friendship, altruism, bias and discrimination, research methods, and statistics. The course uses a college textbook and requires that students do a significant amount of independent reading. Students come to class prepared to engage in interactive work, such as the analysis of case studies and current or historical events. Students also design and carry out an independent research project. In order to fully prepare students for the AP examination, students get ample practice answering AP-style questions.

Grade Requirement: For students completing Grade 9 and up; completion of 10th grade recommended.

Homework per class meeting: 3-7 hrs.

Recommended credit: 10 units

Tuition: \$950 (\$850 base tuition + \$100 facilities fee)



Thinking about thinking?

Learn about the brain in **Cognitive Neuroscience** on p. 13.



NATURAL SCIENCES



Introduction to Astronomy & Astrophysics

SD3974 M W F 1:00 - 4:30 Lorraine Cook



NOTE: This course has a **four-week** schedule. It starts **June 17** and ends **July 12**.

In this course, students will learn about many of the objects that make up our solar system and surrounding galaxy, as well as some of the physics responsible for the appearance, behavior, and interactions of these objects. Students will gain a quantitative understanding of the movement of celestial objects through the sky and how astronomical tools such as telescopes, astronomical cameras, spectroscopy, space probes and orbital observatories help gather data to support claims. Topics include interactions of the Earth, Sun, & Moon; Kepler's Laws and bodies of the solar system; types of stars; nebulae and stellar evolution; discovery of extrasolar planets; galactic structure; and relevant cosmology. Students will utilize authentic astronomical data and interpretation tools using current statistical techniques to establish the identity of objects in our Local Group. This course may include multiple observations of the sun, a late-night sky observation or field trip, and an interview with a practicing astrophysicist.

Prerequisite: Completion of *Geometry* or *Integrated Math II*.

Grade Requirement: For students completing Grade 9 and up.

Homework per class meeting: 2-6 hrs.

Recommended credit: 5 units

Tuition: \$800 (\$580 base tuition + \$220 facilities fee)

Introduction to Biotechnology

SD3971.1 Tu & Th 8:30 - 12:00 Debbie Clark

SD3971.2 Tu & Th 1:00 - 4:30 Debbie Clark

In this course, students will be introduced to the principles and techniques of molecular biology that are used to study and manipulate DNA in basic research, medicine, forensics, and agriculture. We will begin by studying the structure and chemistry of DNA, and we will then learn about many of the laboratory techniques used in recombinant DNA technology, including restriction digests, PCR, bacterial transformation, and immunological assays. In each class meeting, students will conduct hands-on experiments and learn about the real-world uses and implications of biotechnology. Additionally, students will complete weekly current events reports and examine the ethical considerations raised by advances in the field.

Grade Requirement: For students completing Grade 7 or 8.

Homework per class meeting: 3-6 hrs.

Recommended credit: 5 units

Tuition: \$800 (\$580 base tuition + \$220 facilities fee)

Introduction to Engineering

SD3972 Tu & Th 1:00 - 4:30 Staff

The course is designed to give students an overview of diverse engineering disciplines—mechanical, electrical, and civil—in order to find out what engineers actually do. Students will see the difference between “science” as the discovery of new knowledge and “engineering” as the uses of that knowledge in new environments. Students will practice their own engineering skills, finding out how things work in the real world through various projects and hands-on activities. The course will emphasize creative and analytical problem solving, hands-on building activities, design, and teamwork.

Grade Requirement: For students completing Grade 7 or 8.

Homework per class meeting: 2-4 hrs.

Recommended credit: 5 units

Tuition: \$800 (\$580 base tuition + \$220 facilities fee)

Introduction to Chemistry

SD3973.1 Tu & F 8:30 - 12:00 Staff

SD3973.2 Tu & F 1:00 - 4:30 Staff

Throughout this course, laboratory activities and discussions will focus on how chemists describe matter and its changes within the context of alchemy and early chemistry. Understanding the periodic table, the particulate nature of matter, ionic compounds, and solution chemistry will provide the basis for students to think about the world in terms of particles and their interactions. This course provides a grounding in scientific principles, which will prepare students to continue on to a high school chemistry class.

Grade Requirement: For students completing Grade 8 and up.

Homework per class meeting: 3-5 hrs.

Recommended credit: 5 units

Tuition: \$800 (\$580 base tuition + \$220 facilities fee)





Advanced Biotechnology

SD3975.1 M W F 8:30 - 12:00 Jamie Bascom

SD3975.2 M W F 1:00 - 4:30 Jamie Bascom

NOTE: This course has a **four-week** schedule. It starts **June 17** and ends **July 12**.

In this course, students will conduct advanced biotechnology experiments, including DNA extraction, PCR, bacterial transformation, and protein gel electrophoresis. Students will also research and design their own inquiry-driven experiments, which they can then continue during the school year in preparation for the science fair. Additionally, we will explore ethical and political implications of biotechnology; topics include genetically modified organisms, cloning, reproductive biotechnology, and stem cell research.

Prerequisite: Completion of high school Biology. Background in Chemistry recommended.

Grade Requirement: For students completing Grade 9 and up.

Homework per class meeting: 4-8 hrs.

Recommended credit: 5 units

Tuition: \$800 (\$580 base tuition + \$220 facilities fee)

Want to make your mark?

Hone skills that bring your ideas into being with our **arts and architecture** classes on p. 6.



Advanced Robotic Engineering

SD3977 M W F 8:30 - 12:00 Dirk Wright

NEW COURSE: This hands-on, project-based robotics class is designed to develop students' creativity and technological savvy, and engineering skills through the process of building, programming and operating robots designed to perform specific tasks/challenges. The course begins with simple experiments involving sensors and motors. More-complicated tasks involve building integrated prototype devices that collect data using sensors, process this data using computer-language code (Robot C), and execute tasks via computer-controlled motorized manipulation of simple machines follow. Students are responsible for developing devices in teams and communicating the reasons why they chose a particular method for achieving their team's goals. This will be done in various ways, including maintaining an engineering notebook, designing websites/blogs/posters and making presentations. The course fosters cooperative interaction and emphasizes the interdisciplinary nature of robotics and the social and real-world application of technical enterprise.

Prerequisite: Completion of Algebra I or Integrated Math I.

Grade Requirement: Open to all qualified SD students.

Homework per class meeting: 3-6 hrs.

Recommended credit: 5 units

Tuition: \$1100 (\$900 base tuition + \$200 facilities fee)

Cognitive Neuroscience

SD3981.2 M & W 1:00 - 4:30 Paul Bulakowski

SD3981.4 Tu & Th 1:00 - 4:30 Paul Bulakowski

Cognitive neuroscientists aim to answer one of the last remaining fundamental questions of science: how does a three-pound lump of organic material—the brain—support such a wide array of functions, such as perception, thinking and reasoning, emotion, movement, and consciousness? Through active college-style lectures, demonstrations, and hands-on activities, we will explore modern theories and applications of adult and developmental neuroscience, along with the research methodologies used (e.g., single unit recording, fMRI, EEG, psychophysics). We will use diverse college-level reading materials to introduce key topic areas of Cognitive Neuroscience, including cells and systems, sensation and perception, attention, learning and memory, emotion, and development. An end-of-year project will provide the opportunity to learn how to read and evaluate primary research articles directly from the scientists in the field and propose an experiment on a brain topic of special interest.

Prerequisite: Completion of high school Chemistry, or high school Biology, or AP Psychology.

Grade Requirement: For students completing Grade 9 and up.

Homework per class meeting: 6-10 hrs.

Recommended credit: 5 units

Tuition: \$650 (\$570 base tuition + \$80 facilities fee)



ATTENDING



Secondary Division students can expect an intense and unforgettable experience at one of the world's most eminent public college campuses. Whether traveling from your neighborhood BART station or arriving from out-of-state, ATDP students should prepare for a stimulating preview of the rigors of university study.

Acceptance – p. 14

Tuition & Payment – p. 15

Location & Transportation – p. 16

Orientation & Preparation – p. 16

Attendance – p. 17

Final Evaluation – p. 17

Acceptance

PLACEMENT MAILING

Students who have been accepted to ATDP and who applied by the early or standard postmark deadlines will be mailed an acceptance packet on March 28. This packet contains a welcome letter with important information, your course placement, tuition payment instructions, our Explorations guide (see “Explorations,” p. 2), a campus map, and the *Notification of Attendance or Withdrawal* form.

CONFIRMING PLACEMENT

To confirm course placement, students who plan to attend must return the *Notification of Attendance or Withdrawal*, in addition to their emergency information and tuition payment, by the appropriate tuition deadline (according to their application date). See p. 19 for deadline dates.

Providing immunization records. University of California policy requires all students participating in campus programs to provide proof of immunization. Families of students who are admitted to the program should be prepared to provide immunization information for each student when they confirm their course placement. Returning families who submitted immunization records previously will not need to submit them again so long as the records are accurate and on file.

OTHER PLACEMENT DECISIONS

In certain situations, students may be accepted to the program without a course placement:

In a wait pool. Very popular courses fill quickly. If your first course choice becomes unavailable, we will automatically place you into a pool of applicants to be considered if a spot opens. Unlike a traditional waiting list, all applicants are considered for openings, and we use the same criteria as in our normal application process. Applicants may join wait pools regardless of their placement status.

Need alternate course choices. Many factors determine whether an applicant qualifies for

a particular course, including prerequisites, grade level, and strength of the academic profile relative to other applicants. If an accepted student does not qualify for the particular course(s) indicated on the application, we will ask for alternates. We are happy to work with applicants to find the best course placement.

ATDP isn't for everyone! We encourage students who cannot commit to attending ATDP or who have not been accepted to explore other summer opportunities at UC Berkeley or elsewhere. These students are welcome to apply again for summer 2020.



Tuition & Payment

TUITION

Tuition fees for ATDP courses can be found under the individual course descriptions (pp. 5-13). These include the base tuition fee and facilities fee, but do *not* include the application processing fee, nor expenses for textbooks, personal supplies, or transportation. Families will be notified of their balance due when placement decisions are made available. For those making a single payment, families will have until their tuition deadline to send payment for the entire balance. If a family needs to pay in installments, the first payment of at least \$100 must be sent by April 29 and the remaining balance must be fully paid by Friday, July 26 (the last day of classes).

See p. 19 for tuition deadlines.

APPLICATION PROCESSING FEE

There is a processing fee for each application. The fee is \$50 for domestic students. For international students attending school outside the US, the fee is \$80 and must be paid online. This fee is non-refundable. It covers only the cost of application processing and does not apply toward tuition or facilities fees. Available payment methods include:

- Online payment by credit or debit card (online applications only).
- Check or money order made payable to “UC Regents.” Write “SD” and the student’s first and last name on the memo line. Mail or deliver your check payment to ATDP.
- Those applying for need-based financial aid may apply for a processing fee waiver if the fee poses a financial hardship. See *Financial Aid*, right.

We cannot accept cash payments or foreign checks/money orders.

SIBLING DISCOUNT

For families sending two or more siblings to the program, a \$35 tuition discount is available for each student. For example, if two siblings attended, each student would receive one \$35 discount from tuition, for a total family discount of \$70. This discount is taken from course tuition only, not from the application processing fee or the facilities fee.

FINANCIAL AID

ATDP is a self-supporting program funded by student fees. However, limited need-based financial aid is available to qualified applicants. We are unable to provide financial aid to international students, those coming from outside of the immediate San Francisco Bay Area, or 11th graders who are new to the program.

Requests for financial aid—complete with supporting documents, tax returns, and schedules—are due by the standard application deadline of Wednesday, February 27, 2019. ***We do not consider applications for financial aid after this deadline.*** If payment of the non-refundable \$50 processing fee poses a financial hardship, attach a signed note of explanation with the tax returns in lieu of the payment.

All admission and placement decisions are made independently of financial aid status. Your application will not be held up pending a financial aid decision. However, we can only evaluate your request for financial aid once we receive all required documents. Financial aid decisions are based on total resources, not only on household income. Applicants who are accepted will be mailed notification of the amount of financial aid on March 28. Awards cover base tuition only; they do not cover transportation, textbooks, course facilities fees or other expenses. Families who need to pay tuition in installments will have until July 26 to do so. Details will be included in the acceptance letter.

Instructions for applying for financial aid are included with the online or paper application.



REFUND POLICY

A parent whose registered student is unable to attend must withdraw the student in writing and may request a tuition refund. Prior to Wednesday, May 15, 2019, tuition and facilities fee payments are refundable. After May 15, refunds are subject to the ATDP Refund Schedule, which will be included in the student’s acceptance packet.

No refund will be made in the case of a student who fails to attend classes or is withdrawn from ATDP for failure to meet the standards of appropriate behavior, including completion of homework. The application processing fee is also nonrefundable.



Location & Transportation

All SD courses are held on the UC Berkeley campus, which is conveniently located a short walk away from the Downtown Berkeley BART station and several AC Transit bus lines. Many families choose to carpool to campus, and information about carpools, BART meet-ups, and campus shuttles will be provided in the student's acceptance packet. For families driving to Berkeley, please visit UC Berkeley's Parking and Transportation website (pt.berkeley.edu) for parking details.



THE ATDP MAIN OFFICE

Though most other university buildings do not have street addresses, you can find University Hall at 2199 Addison Street in Berkeley on the west edge of campus. Follow signs to find us in room 70 on the ground floor.

COMMUTER DIRECTORY

For students interested in travelling together, ATDP provides an online directory of other students from their area who are also interested in commuting. Families then contact each other and form their own carpool or BART groups. The commuter directory is available only to students who have been accepted into the program, who have an online account, and who have opted into the directory themselves.

If you and a sibling or friend want to attend ATDP at the same time so that you can commute together, include the request in the Letter of Interest in both applications. Make certain that the schedules of the courses you

My sibling/friend and I need to have class at the same time. What can I do to ensure that we can commute together?

Attach notes to both of your applications indicating that you need to travel together and make certain that your courses' times match. The earlier you both apply, the more likely it is that we will be able to work with your schedules.

each request match. The earlier you both apply, the more likely we will be able to work with your schedules.

BART

Since Berkeley parking is extremely difficult, many visitors travel by BART via the **Downtown Berkeley station**, which is a 3-minute walk from the edge of campus.

Youth Clipper. For Secondary Division students who prefer the convenience of BART to travel to and from campus, the Youth Clipper card allows those age 18 or younger to ride at half the price of a standard fare. These discounted cards may be obtained by a brief application in person or via mail, email, or fax. Visit www.clippercard.com/discounts for application information.

Note: BART has discontinued the "BART Orange" program for discounted student paper tickets. However, students may still use existing Orange tickets to travel to and from ATDP during the summer.



Orientation & Preparation

WELCOME & ORIENTATION

The Secondary Division orientation will be held for students and families on Saturday, June 1. This is a good time for accepted students to become familiar with the Berkeley campus, meet their instructor and their new classmates, ask questions of the ATDP staff, and find their classroom location.

TEACHER LETTER & FIRST ASSIGNMENT

At the end of the orientation program, Secondary Division instructors will hand out an important letter to students that includes contact and course information. **Most instructors will assign coursework to be completed prior to the first class meeting.** This letter will be mailed home to students who do not attend the orientation.

TEXTBOOKS

Most course textbooks will be available for purchase at University Press Books, starting from Orientation on June 1 until your first day of class. Some instructors will prepare a course-specific reader purchasable at Telegraph Copy Central. Please note that textbooks and students' supplies are not included in tuition.



Attendance

There are no excused absences at ATDP. As expectations are high and courses are fast-paced, even one absence makes it difficult to keep pace. Therefore, students are expected to attend every class session. Even in the case of unanticipated circumstances, there are some things that cannot be “made up” (such as introductions, class participation, group activities, presentations, or examinations, for example).

If there are special circumstances that will affect a student’s ability to *attend every class*, please contact the program office; anticipated absences not addressed prior to the full refund deadline will not be accommodated. Barring exceptional circumstances, students who anticipate missing more than one class session will not be allowed to attend the program. If you have concerns about your summer schedule, we strongly advise you to contact our office before applying.

POLICY

Missing too much class time for any reason may result in dismissal from the program without refund. All matters affecting regular attendance—absence, coming late, or leaving early—must be communicated in writing to the program office (not the instructor) by a parent or guardian (not the student). Anticipated absences not addressed prior to the May 15 refund deadline will not be accommodated. A student’s attendance record will be taken into account in admission decisions in subsequent years. Attendance decisions are not related to whether the student is taking the class for a possible recommendation of credit. Students who miss class time may not be eligible for a recommendation of credit and may not receive a final evaluation. Attending every class does not guarantee that a student will be recommended credit.

INDEPENDENCE DAY HOLIDAY

The UC Berkeley campus will be closed on Thursday, July 4, 2019, in observance of Independence Day. Any course that is normally held on a Thursday will have a make-up class session. Make-up classes will be determined and announced per class by the course instructor; most are rescheduled for the week of July 4. Classes will be held as normal on Friday, July 5.

Where can I find summer housing near UC Berkeley?

ATDP is not a residential program. Unfortunately, we are unable to assist families with housing arrangements.



Final Evaluation & Grade

Upon completing a Secondary Division course, ATDP students will receive a final evaluation from their instructor. Printed on official UC bond paper, this document can be sent to schools as proof of course completion. It includes the instructor’s narrative evaluation of student performance, final letter grade, and whether the student has earned a recommendation of credit. ATDP will send one copy home in August and, if authorized by you, one copy to a selected school at no charge.

ATDP cannot provide a transcript for any of its courses, and the final evaluation is not an acceptable substitute for a high school transcript. For more information about ATDP’s recommendation of credit, see “Credit” on page 2.

APPLY



ATDP has a more thorough application process than many other programs because it's crucial for us to have as well-rounded an academic profile of the applicant as possible. This allows students to show their strengths in different ways, and it ensures they are prepared for the rigors of a fast-paced Secondary Division course. It also gives them practice for the college application process!

Deadlines & Notification – p. 19

Required Materials – p. 20

THE APPLICATION PROCESS

We make every effort to place all qualified students in their first-choice course. ATDP reviews applications on an ongoing basis, beginning when an application is complete. However, course enrollment is limited, and there are often more qualified applicants than the program can accommodate. It is generally advantageous to apply early, preferably well before the postmark deadlines (see p. 19). The application process is the same for new and returning students. Students must reapply every year, and returning students are not guaranteed automatic readmission or placement in their first choice of course. Incomplete applications are not considered for placement.

Early Application. A limited number of spots in each course will be reserved for early applicants. Early applicants who are admitted will find early acceptance information in their online account. Applicants submitting

If admission is based on academic preparedness, why is applying early so important?

Applications are considered in the order in which they are completed. For the most competitive courses, there are always more qualified applicants than the program can accommodate. Highly qualified applicants who apply early have the best chance of being placed in their preferred courses at their preferred meeting times.

NEW THIS YEAR: COMPLETE YOUR APPLICATION ONLINE

We are excited to share that the online application process has been updated to allow applicants to complete their applications *entirely online*. Application materials may now be uploaded (optional), and the application processing fee may once again be paid by card online. ATDP will continue to have a paper option for those who prefer to send their materials by mail.

a paper-only application *cannot* apply as early applicants.

As in previous years, returning students will receive priority if they apply early. Based on the number and relative strength of other early applications, an early applicant may be automatically converted to a standard applicant if no early acceptance decision is possible.

Standard Application. The standard application deadline is available for those applying both online and via hard copy. Availability may be limited in the case of very popular courses. Those applying for need-based financial aid must apply by February 27, the standard application deadline.

Extended Application. For courses that still have open spots after the standard application period, we will accept applications on a rolling basis. Financial aid will no longer be available for applications completed after February 27.

New vs Returning. A student who applied in a previous year and then withdrew without

completing a course will be considered a new student for admission purposes. Students who have attended the Elementary Division previously and are applying to the Secondary Division for the first time are also considered new students, but their previous participation is noted.

ACCEPTANCE DECISIONS

On Thursday, March 28, ATDP will mail a letter to applicants who applied on or before the standard deadline informing them whether they have been accepted. Acceptance packets will include your course placement, balance due, and forms required for attendance. If you applied online, a preview of this information will also be available in your account beginning on March 28.

Acceptance decisions for extended applications are made on a rolling basis, and will usually be available within 10-15 business days of receiving a complete application.

Apply Online

Visit atdp.berkeley.edu to begin your application.

- See p. 20 for a summary of materials required to complete your application.
- Review detailed application instructions at atdp.berkeley.edu/apply/sd before you begin.

New applicants will need to register an online account. Returning families should use the same account they used previously. Once you're logged in, access the "My Account" menu in the upper right. Click on the name of a returning student, or select "Apply for a new student," and follow the on-screen instructions.

Can't apply online? If you are unable to access the online application, complete the paper *Application Information Form* and mail it with the required materials to ATDP. English and Spanish language paper forms can be downloaded from atdp.berkeley.edu/resources. Your school counselor may have also been provided paper forms, or you can contact our office to have forms mailed to you. Online services will be unavailable to those who submit a paper application.

Recursos en español están disponibles en nuestro sitio de Internet.



Deadlines & Notification

ATDP evaluates applications on an ongoing basis in the order they are received, beginning when an application is complete. ***The earlier you apply, the better your chances at receiving placement into your preferred course!***

EARLY APPLICATION	STANDARD APPLICATION	EXTENDED APPLICATION
<ul style="list-style-type: none"> ■ Financial aid available ■ Must apply online ■ Returning SD students receive priority 	<ul style="list-style-type: none"> ■ Financial aid available 	<ul style="list-style-type: none"> ■ Financial aid NOT available ■ Limited course availability ■ Rolling acceptance decisions
Application Postmark Deadline: Wednesday, February 13	Application Postmark Deadline: Wednesday, February 27	Final Postmark Deadline: Wednesday, May 29
Acceptance Decisions: Wednesday, March 13 (online*) Thursday, March 28 (mailed)	Acceptance Decisions: Thursday, March 28	Acceptance Decisions: within three weeks of receipt of the completed application
Tuition Deadline: Monday, April 15	Tuition Deadline: Monday, April 29	Tuition Deadline: within two weeks of receipt of the acceptance decision

* Early applicants have access to a preview of acceptance information online, but they will still receive a mailed packet at a later date.

Subscribe to our **community newsletter** at atdp.berkeley.edu/news or follow us on **Facebook** at facebook.com/ucb.atdp to receive notification as soon as these dates are available!



Required Materials

Just like applying to college, a complete application requires several supporting documents (see below). Be mindful of your desired application deadline as it can often take several days to collect your documents and complete the application.

The complete application instructions at atdp.berkeley.edu/apply/sd (or on your paper form) detail the requirements for each item

that is needed for a complete application. We highly recommend that you review these instructions and then prepare as many of the items as possible before you complete the application form. This may include scanning if you plan to upload your materials, and/or photocopying or printing if you plan to mail them.

Application items are listed below in brief.

- A formal **Letter of Interest** composed by you (the student applicant) to act as a cover letter for your application
- The **Teacher Recommendation Form (TRF)**, a brief form for a current academic teacher to complete (Note: *ATDP does not review separate letters of recommendation*)
- A copy of your most recent **report card**
- A copy of **achievement test scores**
- A written **academic product or essay**

The application processing fee is \$50 for domestic students, payable online with card or by mail with check or money order. For students attending school outside the US, the fee is \$80, payable online only. See p. 15 for additional information.

Need-based financial aid is available for students who would otherwise be unable to attend. To apply for aid, your application should also include your parents' or guardians' federal tax return. See p. 15 for additional information.

I'm not from the San Francisco Bay Area. May I apply?

Yes! ATDP is open to students from the Bay Area and beyond. Students from many countries—including Taiwan, Italy, Kuwait, and Singapore—have attended. However, please note that (1) ATDP is not a residential program and we cannot assist with housing arrangements, and (2) financial aid is limited to students from the immediate Bay Area.



How are financial aid awards determined?

Financial aid awards are based on total family resources, determined in part by tax returns and schedules. We make every effort to help families with limited resources; however, we are often unable to offer full financial aid, and families who receive full financial aid for tuition will still need to pay the course facilities fee.

A drastic change in my financial situation is not reflected on my tax return. What should I do?

Attach a letter explaining your situation, as well as any supporting documents (e.g., unemployment forms) to the tax forms you send in.

STAFF & ADMINISTRATION



Prudence Carter
Dean
Graduate School of Education



Lisa Kala
Program Director



Frank C. Worrell
Faculty Director



PROGRAM STAFF

Stevie Jeung (with Fiona), Cynthia Nie, Asst. Director Carrie Brown, Samuel Pierce, Mildred Flores, Thomas Tallerico



University Hall
ATDP Main Office



Berkeley Way West
Graduate School of Education

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Research participation. ATDP has a responsibility to conduct research that contributes new knowledge that leads to growth and improvement in our understanding of how academically talented students learn and how they can be better served. We ask our students and their families to assist in this effort by contributing between 1 and 3 hours per year to participating in this research. However, opting not to participate in research will in no way affect admission into the program. Before a student can participate in a study, ATDP gives detailed information about it to the student and his or her parent(s) and obtains their informed consent in writing.

Nondiscrimination statement. The University of California, in compliance with Title VI of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, Section 504 of the Rehabilitation Act of 1973, and the Age Discrimination Act of 1975, does not discriminate on the basis of race, color, national origin, sex, handicap, or age in any of its policies, procedures, or practices; nor does the University discriminate on the basis of sexual orientation. This nondiscrimination policy covers admission and access to, and treatment and employment in, University programs and activities, including but not limited to, academic admissions, financial aid, educational services, and student employment.

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2019 CALENDAR

APPLICATION & NOTIFICATION DEADLINES – see p. 17 for details

	<i>Early</i>	<i>Standard</i>	<i>Extended</i>
POSTMARK DEADLINE	Wed., February 13	Wed., February 27	Wed., May 29
ACCEPTANCE DECISION	Wed., March 13	Thurs., March 28	rolling (see p. 17)
TUITION DEADLINE	Mon., April 15	Mon., April 29	rolling (see p. 17)

REFUND DEADLINE	Wed., May 15	Last day to request a full refund
MATH TESTING	Sat., May 18	Placement & diagnostic testing for students in most math courses
WELCOME & ORIENTATION	Sat., June 1	Orientation for students and parents Textbooks and course readers available for purchase
CLASSES	Mon., June 17	Secondary Division classes begin at UC Berkeley
	Thurs., July 4	Holiday Wednesday classes will hold a make-up session (to be determined)
	Fri., July 26	Classes End Last day to complete payment for those paying in installments