



City College of San Francisco
iDesign Summer Programs (2011)
Final Grant Report

Sept 13, 2011

<http://www.californiatechedresources.org/idesign/>

PROJECT

Brief summary of project and its goals

iDesign is a free program for high school students interested in technology. It is a hands-on course where students design, build, play, travel, take apart, and learn – all while having fun and learning how technology helps society. It is administered through City College of San Francisco (CCSF).

There are 2 different programs under iDesign:

- iDesign-E – a 2-week program for students interested in learning and experiencing engineering. It was held from June 6 – July 17, 2011 at CCSF Ocean Campus.
- iDesign-M – a 2-week program for students interested in learning and experiencing manufacturing technology. It was held from June 20 – July 6, 2011 at Laney College in Oakland.

The goal of these programs is to excite and inspire students in careers in technology. We are also encouraging students to consider community colleges as an option for college classes during, or after, high school.

This was the third year for the iDesign-E program, and the second year for iDesign-M. We had 39 students participate in the programs (24 in iDesign-E, 15 in iDesign-M), with students from San Francisco, Oakland, Livermore, and San Leandro.

iDesign-E

Overview

The iDesign-E students met for 10 days from 9:00 – 4:30 pm, Monday through Friday. The course was a mix of projects (wind turbine and electronic “Blinky” circuit), lectures, field trips, and guest speakers. We wanted the students to hear from engineers, and also see up close where and how they work.

The twenty-four students (18 female, 6 male) came from the following San Francisco schools:

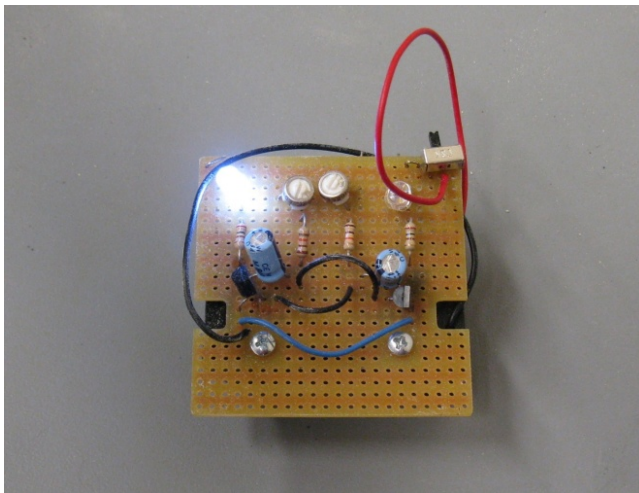
- Burton (1)
- Galileo (8)
- Lowell (11)
- Mission (3)
- Washington (1)

Teaching the course we had two engineering faculty from CCSF (Mike Kimball & Hitesh Soneji) and two course assistants (Hugo Tupac & Alex Saari). In addition, Mark Martin helped teach and handle logistics.

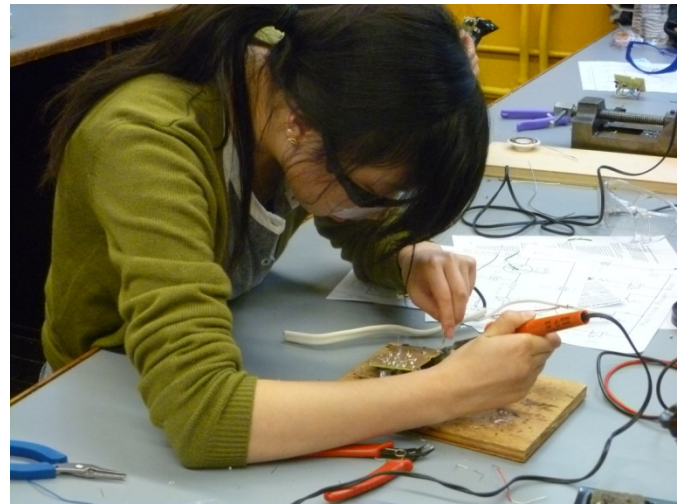
We had speakers from Logitech, Wild Planet Toys, and Forell / Elsesser Structural Engineers; and went on field trips to the BART maintenance facility in Hayward, United Airlines maintenance facility, and the CALTRANS Doyle Drive project.



Wind turbine project



Blinky project



A detailed schedule follows.

iDesign-E Program 2011

7/17/2011

	6-Jun	7-Jun	8-Jun	9-Jun	10-Jun	13-Jun	14-Jun	15-Jun	16-Jun	17-Jun
	Mon	Tues	Wed	Thurs	Fri	Mon	Tues	Wed	Thurs	Fri
9:00 - 9:30	Intro (S-100)	LAB: - Blinky project	ACTIVITY: - Discuss wind testing	Meet for FT Leave at 9:15 am	PROJECT	SPEAKER: - Toys (Katie Broughton)	PROJECT	PROJECT	Meet for FT	PROJECT
9:30 - 10:00	Team-building exercises	LAB: - Blinky project	LECTURE: - Wind Power (HS)	Travel	PROJECT	SPEAKER: - Toys	PROJECT	PROJECT	TRAVEL	PROJECT
10:00-10:30	Team-building exercises	LAB: - Blinky project	- Break out into teams - Team names (30 minutes)	BART (Hayward)	PROJECT	PROJECT	PROJECT	PROJECT	10:00 - 11:30 pm United Airlines	PROJECT
10:30 - 11:00	Team-building exercises	LAB: - Blinky project	LECTURE: - Wind Project (HS)	BART (Hayward)	PROJECT	PROJECT	PROJECT	SPEAKER: Logitech (Minja Lohrer) - CONFIRMED	10:00 - 11:30 pm United Airlines	PROJECT
11 - 11:30		LAB: - Blinky project	LECTURE: - Wind Project (HS)	BART (Hayward)	for project. Tools for project (30 minutes)	PROJECT	PROJECT	SPEAKER: Logitech	10:00 - 11:30 pm United Airlines	PROJECT
11:30 - 12	CCSF Orientation / CCSF Tour (meet at Conlan Hall)	LAB: - Blinky project	- Brainstorm what you think the requirements for a wind turbine	BART (Hayward)	Decision (vertical or horizontal) GROUP	PROJECT	PROJECT	SPEAKER: Logitech	TRAVEL	LECTURE (MM / HS): Types of Engineering
12 - 12:45	Lunch	Lunch	Lunch	Lunch	Lunch	Lunch	Lunch	Lunch	Lunch	Lunch
12:45 - 1:30	LECTURE (HS): Electronics (12:45 - 1:45)	LAB: - Blinky project	ACTIVITY: - Create schedule	BART (Hayward)	PROJECT	PROJECT	PROJECT	PROJECT	Travel	Lab clean-up Prepare for presentations
1:30 - 2	LECTURE (MK/HS): Soldering - (1:45 - 2:15)	LAB: - Blinky project	- Online research & start of brainstorming of blade designs	Travel	PROJECT	PROJECT	PROJECT	PROJECT	CALTRANS (Doyle Drive)	Lab clean-up Prepare for presentations
2 - 2:30	LECTURE: - Soldering (MK)	LAB: - Blinky project	- Online research & start of brainstorming of blade designs	BART (Hayward)	PROJECT	PROJECT	PROJECT	PROJECT	CALTRANS (Doyle Drive)	Lab clean-up Prepare for presentations
2:30 - 3	LAB: - Blinky project	LECTURE: How does a Blinky work (HS)	LECTURE: Airfoils (MK)	Travel	PROJECT	PROJECT	PROJECT	PROJECT	CALTRANS (Doyle Drive)	Lab clean-up Prepare for presentations
3 - 3:30	LAB: - Blinky project	ACTIVITY: - Blinky project oscilloscope probing	PROJECT	PROJECT	PROJECT	SPEAKER: - Structural Engr (Marco Scanu)	PROJECT	TESTING: Power generation from each team	CALTRANS (Doyle Drive)	Project presentations
3:30 - 4	LAB: - Blinky project	ACTIVITY: - Measure wind speeds around campus	DEMO: - How to build blades	PROJECT	PROJECT	SPEAKER: - Structural Engr	PROJECT	TESTING: Power generation from each team	CALTRANS (Doyle Drive)	Project presentations
4 - 4:30	LAB: - Blinky project	ACTIVITY: - Calculate power from wind	Field trip (FT) prep	PROJECT	PROJECT	SPEAKER: - Structural Engr	PROJECT	- TESTING -Field trip (FT) prep	Travel	Project presentations RECEPTION

iDesign-E Assessment and analysis of whether intended outcome was realized

Our goal in the program was to excite the students about engineering, and give them information on how to pursue engineering as a career path.

Based on responses from the students (24 of 24 responded), we feel we achieved this goal. We received informal feedback from the students during the program and at the final presentations that indicated the students enjoyed iDesign-E and found it educational. In addition, we conducted a formal, anonymous survey following the program. The results of this are summarized in the Appendix, but some of the main points:

- 100% agreed (or strongly agreed) that iDesign-E was educational (96% in 2010).
- 96% agreed (or strongly agreed) that iDesign-E was fun (96% in 2010).
- 83% said it strengthened their interest in pursuing engineering as a career (92% in 2010).
- 91% of the students would recommend the program to a friend (with the remaining two people answering “maybe”) (91% in 2010)
- 61% said that the iDesign program made them more interested in attending CCSF classes (27% in 2010)
 - Note: I’m not sure why such a large increase in interest. We didn’t really change how we introduced them to CCSF. Maybe it has to do with the difficult economy, and the increase in UC / CSU tuitions, along with those schools’ reduction in admittance of California students.

Some comments from the students:

“The hands-on learning was amazing because the sense of accomplishment I felt after learning about something through building it with my own hands is a feeling that I would never be able to find within the textbook --> homework --> study --> test that I so often experience in the high school classroom. I loved that this program was able to combine both the fun and the educational through giving us a huge amount of knowledge, and then giving us a chance to apply that knowledge.”

“It was fun WHILE educational! - Rare.”

“too many girls! ... program was too short!” (from a female student)

“iDesign was the one of the best experiences I've had, I would certainly recommend this program to anyone who has an interest in engineering or just exploring interests. During the program, I was able to have many hands-on experiences, some of which I would never see happen even at school.”

“All of the field trips were extraordinary; the speakers were very informative and the experience was truly unique. I am grateful for the unique once-in-a-lifetime opportunities we received, and for the huge amount of behind-the-scenes action that we were able to witness. Often times, we hear about jobs that are available in certain companies, and we are often given a brief description of what their job comprises of, but we never really get to hear from the workers themselves, or see things from their point of view.”

“I loved driving bart and lunar design was awesome. It was a great experience!!!”

“The speakers were thoroughly informative and were always willing to answer questions. They really nudged me towards a career/job oriented mindset as opposed to the academically oriented mindset that I was so used to. After all, our schooling's ultimate goal is to prepare us for a career in a certain field, but so often we tend to focus on getting by in the schooling that it's very refreshing to have speakers from certain careers really remind you of where you're headed and what possibilities are out there.”

“Anybody who has even the slightest interest in engineering should take part in this program. even if they find out engineering isn't their cup of tea by the end of the first week, they would still enjoy the awesome field trips and amusing teachers and classmates.”

“i loved it. i was really unsure of what engineering was and how right it was for me but after two weeks i felt pretty sure that engineering was a good choice for me and what i aimed for in the future.”

“great and insightful field trips and nice, helpful, friendly guest speakers.”

“To be honest, there's really nothing about the program that I didn't like. Except for maybe the fact that it was so short but I know I'm lucky to have had those two weeks. If funding allows it though, I believe future i-Designers would love to have three weeks! :)” (Note: we ask the students what they like least about the program)

“Nothing! Everything was great but if there is one thing, it would be the classroom's chairs. More comfortable chairs! BOOoo on the stools, they aren't comfortable. :(“

“I loved the hands on experience that it gave us. I loved how they never really gave us instructions or a guide book on what to do; it was all about figuring it out on your own. In the beginning of this program, I really didn't understand why it was called iDesign, but after the two weeks I wouldn't change the name for anything else. Because this was exactly what we did, we designed and created things that I didn't believe was capable on our own. We were the creators and they gave us what was necessary to make our designs come true. This program gave me a lot of hope and showed me that I was capable.”



Doyle Drive field trip



“Leavin’ on a BART train, don’t know when I’ll be back again”



United Airlines field trip

iDesign-M Schedule

The students met for 10 days from 9:00 – 4:45 pm for ten days (June 20 – July 6). We were originally going to run it Monday – Friday for 2 weeks, but due to budget cuts Laney closed on Fridays so we had to extend the program into a 3rd week.

The course was a mix of projects, lectures, field trips, and guest speakers. We wanted the students to hear from those working in the manufacturing industry, and also see up close where and how they work. We had field trips to General Foundry (casting) and Allied Engineering (machining of large scale projects, such as valves for Hetch Hetchy pipes).

The main project was the design and creation of a 1/24th scale model car. Using various manufacturing technologies (milling, turning, grinding, polishing, drilling, CNC, anodization, etc.), the students each made their own car.

The twelve students (14 male, 1 female) who completed the program came from the following Oakland schools:

- FarWest (2)
- Livermore (1)
- MetWest (4)
- Oakland School of the Arts (1)
- Oakland Tech (4)
- Rudsdale (1)
- San Leandro (1)
- Zapata Street Academy (1)

The lead teacher for the course was Peter Brown, who is on the faculty in the Laney College machining department. In addition, we had four course assistants. Mark Martin helped with logistics.

One major difference this year than last is that students were enrolled in, and received credit for, a Laney College class (1.5 units). Because of this we had to extend the program by a few hours to meet the course requirements, but this gave most of the students their first opportunity to be enrolled in a college class.



Designing their scale-model car



Machining



Rapid prototyping



Chillin' at the Allied Engineering field trip



Scale-model cars (before anodization colorization)

A detailed schedule follows.

iDesign-M Program 2011 (tentative)

8/8/2011

	20-Jun Mon	21-Jun Tues	22-Jun Wed	23-Jun Thurs	27-Jun Mon	28-Jun Tues	29-Jun Wed	30-Jun Thurs	5-Jul Mon	6-Jul Tues
9:00 - 10:30	Team-building exercises	MACHINING	MACHINING	9:00 am Bus 9:30 am - 11:00 am General Foundry	CAD DEMO	Machining Project	Machining Project	Machining Project	Machining Project	Machining Project
10:30 - 12	Campus Orientation / Tour	MACHINING	MACHINING	General Foundry Lunch	CAD DEMO	Machining Project	Machining Project	Machining Project	Machining Project	Machining Project
12 - 1:00	Lunch	Lunch	Lunch		Lunch	Lunch	Lunch	Lunch	Lunch	Lunch
1:00 - 2:30	DEMO & SAFETY LECTURE: Machining	MACHINING	MACHINING	Allied Engineering Plant Tour	Machining Project	Machining Project	Machining Project	Machining Project	Machining Project	RECEPTION / Presentations
2:30 - 4:45	DEMO & SAFETY LECTURE: Machining	MACHINING	MACHINING	Allied Engineering Plant Tour	Machining Project	Machining Project	Machining Project	Machining Project	Machining Project	RECEPTION / Presentations

iDesign-M Assessment and analysis of whether intended outcome was realized

Our goal in the program was to introduce the students to manufacturing, and give them insights into different career paths, as well as get them acquainted with Laney Community College.

During the program, and at the final presentations (where many students brought family or friends), we heard the students express pride in the work they had done. We also conducted an anonymous, online survey and had five of the fifteen students respond.

- *100% agreed (or strongly agreed) that iDesign-M was educational (100% in 2010)*
- *100% agreed (or strongly agreed) that iDesign-M was fun. (83% in 2010)*
- *60% of the students would recommend the program to a friend, with two people answering “maybe” (60% in 2010)*
- *50% said that the iDesign program made them more interested in attending Laney classes (33% in 2010)*

Some comments from the students:

“I enjoyed every minute of the car project. I was able to build the car I truly wanted to build. It was an amazing experience.”

“The car project was good because we could use all the machines and at the same time create something. More time could be spent understanding the geometry behind what we were doing, especially with the radius lathe.”

“I learned how to plan out my car before i built it, and making sure that the measurements on my sketch were accurate to the actual thing.”

Q: Did the iDesign-M program help you make any decisions about what to do after graduating from high school? If it did, how did it help?

“Yes, it helped me think about another option for the future.”

“Not really, however a career in machining or engineering now seems much more enticing.”

“It let me give myself more options on what careers I want to take in the future.”

Q: What did you like MOST about the iDesign-M program?

“The fact that I was able to use my imagination and I was able to build what I could dream up.”

“Being able to see a project through to completion.”

“Learning.”

OVERALL iDesign Program

Description of any unforeseen challenges and what was or will be done to address them

iDesign-E

The iDesign-E program at CCSF was in its third year, and our only real challenge was to get students to apply from a wider range of schools. In 2010 we had a well-represented class, from eight schools (Ida B. Wells, Mission, Burton, Washington, Marshall, Lowell, Lincoln and Galileo). This year we wanted to “branch out”, but only received applications from six different schools (and five were represented in the class). We contacted more teachers, and went to visit many of the same teachers we did last year, but just didn’t get as many schools. On the plus side, we did have 68 students apply (42 in 2010), and did fill all our 24 slots.

For next year, I think getting a much earlier start will help in notifying the schools. This year we waited until the schedule was determined (we had to work around CCSF classes and teacher availability). Next year we will begin to inform teachers and schools even before we have a final date for the program and will simply give a date of Summer 2012 until dates are finalized.

iDesign-M

For iDesign-M, the biggest challenge, as with the first year, was recruitment. We are still establishing a network of teachers and counselors to help recruit the students since we were doing this in Oakland. As with iDesign-E, we started notifying the schools later than we wanted because we were waiting to lock in the dates. As with iDesign-E, next year we will go ahead and start marketing the class much earlier, even before we get the dates locked in.

Still, we had 30 students apply (compared with 24 in 2010), and we accepted 22 into the program and put the rest on a waitlist. We actually had 23 students show up the first day. We accepted seven (7) students from San Francisco schools this year. Unfortunately, after the first day, all seven of these students dropped – two because they said they weren’t interested in the class, and the other five because they didn’t like the commute. We also had one other Oakland student drop a couple of days later, leaving us with 15 who finished the class (we had 12 in 2010).

This year the teachers felt a number between 15 – 20 students would be good due to limitations on equipment and ensuring that each student received enough teacher attention on the heavy equipment that they would be operating (we had one professor, and 4 teaching assistants). Having 15 students in the class worked out well, with all the students getting lots of teacher attention and equipment time, and all of them finishing their project. In the future, we plan on keeping the number between 15-18.

One unforeseen circumstance that we did encounter was that we originally scheduled the 2-week course to finish before Oakland Unified started their summer school. However, Laney College then decided they would not hold classes on Fridays for budget reasons. Because of this, we had to extend the iDesign-M class into 2 days of the third week, which did conflict with summer school. This may have lost us a few students in the application process.

BUDGET

Below is a table showing the original budget figures, actual expenses, and variances.

iDesign-E 2011 Summer Program

Final Budget

8/23/2011

		Budgeted (4/1/11)	Actual Costs	Variance	Reason for Variance
TEACHING	Faculty & course assistants	\$ 19,451	\$ 22,508	\$ (3,057)	Additional payments to course assistants for extra hours (\$280). Increase in benefit and salary rates from 2010.
TRANSPORTATION	Bus Transportation	\$ 1,200	\$ 1,180	\$ 20	
SUPPLIES	Materials & tools	\$ 800	\$ 660	\$ 140	Original material budget (for Kidwind turbines, Blinky supplies, wind turbines) were estimates.
MISCELLANEOUS	Receptions / food	\$ 600	\$ 343	\$ 257	We intended to have a pre-program pizza party for students and family, but did not schedule one this year.
	EXPENSES TOTAL	\$ 22,051	\$ 24,691	\$ (2,640)	
ADMINISTRATIVE	CCSF Admin Charge (8.0%)	\$ 1,920	\$ 1,920	\$ -	
	CCSF Foundation Fee (5.0%)	\$ 1,000	\$ 1,000	\$ -	
	GRAND TOTAL	\$ 24,971	\$ 27,611	\$ (2,640)	

iDesign-M 2011 Summer Program

Final Budget

13-Sep-11

		Budgeted (4/1/11)	Actual Costs	Variance	Reason for Variance
TEACHING	Faculty & course assistants	\$ 17,601	\$ 15,031	\$ 2,570	We did not bring in separate faculty for CNC and Solidworks demo (\$1000). Reduced hours for faculty and assistants since less setup required, and we had students help clean the shop at the end of the day.
TRANSPORTATION	Bus Transportation	\$ 1,006	\$ 600	\$ 406	We were able to combine the field trips into one day.
SUPPLIES	Materials & tools	\$ 1,000	\$ 3,000	\$ (2,000)	Purchased anodization equipment and materials which can be used in future years (\$800). Purchased specialized tools to make it easier to cut wheel wells and other items. Additional material costs.
MISCELLANEOUS	Receptions / food	\$ 600	\$ 600	\$ -	
	EXPENSES TOTAL	\$ 20,207	\$ 19,231	\$ 976	
ADMINISTRATIVE	CCSF Admin Charge (8.0%)	\$ 1,200	\$ -	\$ 1,200	Direct transfer of funds to Laney
	CCSF Foundation Fee (5.0%)	\$ 750	\$ 750	\$ -	
	GRAND TOTAL	\$ 22,157	\$ 19,981	\$ 2,176	

Total 2011 Costs **\$46,842**

Funding Sources **\$46,842**

Bechtel Foundation	\$30,000
Laney College Tech Prep funds	\$6,000
Logitech	\$5,000
iDesign 2010 surplus	\$3,650
CACT CTE Hub	\$2192

CONCLUSION

Summary

As in previous years, we had a great group of students this year. The survey results from the iDesign-E program again confirm that for those students interested in engineering, we were successful. The students had a chance to talk to engineers in industry, while touring a number of different facilities.

For the iDesign-M program, we were able to make it an official Laney College course, with students receiving college credit. We had students from a number of different Oakland and surrounding area schools. When we had other machine shop teachers visit the shop for meetings, they were impressed with what the students had accomplished in the ten days of classes. In addition, the students were excited about their designs and wanted to try new things (such as the rapid prototyping machine) to test out their designs.

Sustainability

Our goal is to offer both programs again next year contingent on funding. To repeat the refrain from last year, we had hoped that the economy would have recovered by the beginning of 2011 making it easier to raise funds from industry. However, with the uncertainty that existed, companies were still hesitant to donate. With that in mind, we will need to begin the fundraising process earlier this year to reach out to even more potential donors.

For the iDesign-M program, Laney has established contacts with many local manufacturing companies interested in their new Industrial Maintenance certificate program. These are companies such as Shell, Chevron, Tesoro, Anheuser-Busch, and others and we feel they will be good potential donors for next year.

For iDesign-E, we will look towards the contacts we've made during our plant trips, and also ask our alumni and SFUSD contacts to help us reach out to industry.

For both programs we've developed a strong alumni base, and a great teaching staff that will allow us to make the program even stronger in 2012. Thanks again to all our donors, industry supporters, and high school and college staff that helped make the program possible.