

## Pathways to ICT Education and Careers in San Francisco

An Inventory of SFUSD, CCSF, CBO and Broader Community  
Resources, Programs and Information Relevant to  
ICT Education, Training, Workforce Development and Employment

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## Executive Summary

The rapid and pervasive adoption of information and communication technologies (ICT) is changing the ways we communicate and interact with family, friends, suppliers, customers and organizations. Today, 1 in 20 jobs in the country, and in California, is part of the ICT Workforce. In San Francisco, nearly 1 in 4 non-government office jobs are in “tech.” In the dot-com boom of 2000, tech jobs accounted for just 14.5 percent of jobs in that same category. In 2012, San Francisco City and County is rivaling Silicon Valley as a tech hub, as more ICT businesses make it home.

ICT employers in San Francisco need an ICT workforce to be successful. How they get that workforce is an important strategic question. In the last four months, there were 68,000 ICT-related online job postings in California for ICT jobs. Yet, with all of this growth and opportunity, employers are reporting difficulty finding appropriately skilled ICT workers, even in this period of high unemployment.

The vision of San Francisco ICT Pathways Project is to gather strategic stakeholders in San Francisco to improve pathways to ICT education and careers, grow our own ICT workforce, meet employer ICT workforce demand, and improve our economy in the process. The project is being conducted by the Mid-Pacific ICT Center (MPICT.org) using funding from the Broadening Advanced Technological Education Connections (BATEC.org) National Center.

This report documents research on organizations, programs and efforts relevant to ICT Pathways in San Francisco. We encourage anyone with additional relevant information to forward it to MPICT for inclusion in future generations of this report.

What we found was a plethora of unconnected opportunity. Almost 5,000 students enroll annually in ICT related courses at San Francisco Unified, driven and kept alive by a few passionate teachers needing more support. The five ICT departments at CCSF offered more than 220 classes, 32 certificates, 10 AS/AA degrees and numerous opportunities to prepare for industry certifications to more than 8,000 students who enrolled in CCSF ICT classes in 2010-11. The Office of Economic and Workforce Development (OEWD) has a high-priority initiative to align the San Francisco ICT workforce with strategic industries. There is a portfolio of other relevant community based organization, grant funded and government efforts to build on.

With the information gathered in this report, we want to gather and motivate ICT Pathway stakeholders, share information that improves and empowers their efforts, build consensus on an ICT Pathway model framework and graphic, engage in project work to improve ICT Pathways, attract more students into ICT education, support student retention and completion, and effectively prepare them for the exploding ICT workforce.

Recommendations for future work in improving ICT Pathways in San Francisco include: raising awareness, leveraging best practices and curriculum, building stakeholder relationships, providing faculty development, aligning curriculum, and improving student experiential learning opportunities.

It is exciting to be coming together to improve Pathways to ICT Education and Workforce in the midst of this perfect storm.

## The Relevance and Purpose of this Report

### The ICT Pathway: A Career Technical Education (CTE) Pathway

The [California Department of Education](#) defines Career Technical Education (CTE) as a program of study that involves a multiyear sequence of courses that integrates core academic knowledge with technical and occupational knowledge to provide students with a pathway to postsecondary education and careers.

Information and Communication Technologies (ICT) is an umbrella term, widely used outside the U.S. and in the U.N., to encompass all rapidly emerging, evolving and converging computer, software, networking, telecommunications, Internet, programming and information systems technologies. ICT Pathways are among a variety of CTE Pathways (such as agriculture, biotech, manufacturing, energy and health science), but ICT Pathways deserve particular attention and effort, because the ICT industries and employment are booming in California, even in this poor economy and period of high unemployment.



As more educators, industry, parents, and policy makers recognized the demographic, economic, and educational benefits of revitalizing CTE, especially with the focus on re-skilling the middle class, the role of community college support of CTE pathways has become one of collaborator and facilitator, working with all stakeholders to attract, prepare, and retain more students in education and supporting programs that lead them to successful careers.

The work of [National Science Foundation Advanced Technological Education \(ATE\) Centers](#) endeavors to strengthen the skills of technicians, whose work is vitally important to the nation's prosperity and security. In ATE centers and projects, community colleges have a leadership role and work in partnership with universities, secondary schools, business and industry, and government agencies to design and carry out model workforce development initiatives.

Two ATE Centers, the [Broadening Advanced Technological Education Connections \(BATEC\) National Center](#) and the [Mid-Pacific ICT \(MPICT\) Regional Center](#), that serves California, Nevada, Hawaii and the Pacific Islands, have come together to apply NSF funding to focus on ICT pathways in San Francisco City and County. San Francisco provides an attractive environment in which to develop a model ICT Pathways framework because there is one K-12 district and one community college district and existing community, ICT industry and employment are thriving in San Francisco, and industry and workforce development collaborations are focused on ICT and welcoming new partners.

## Why ICT Matters

We are living through a paradigm shift – from 20<sup>th</sup> century manufacturing and transportation industrial economies to 21<sup>st</sup> century information, knowledge and innovation economies. The explosive emergence and pervasive adoption of information and communication technologies are changing the ways we communicate and interact with family, friends, suppliers, customers and organizations. ICT is changing how we work, no matter what we do, and how organizations achieve success in their missions, no matter what they do.

Already in California, and in the U.S., one in 20 jobs is in an ICT workforce role. These are jobs that develop, deploy, manage, and maintain strategic ICT infrastructure, products, services, solutions and organizations. That is about 1.2 million jobs in California. On average, these jobs pay twice the median wages in the state, and anticipated ICT job growth is higher than in most other job sectors. In the last four months, there were 68,000 ICT-related online job postings in California for occupations in a wide range of skill and education levels. For example:

- Computer Systems Analysts (29,731 job postings)
- Network/Computer System Administrators (18,541)
- Database Administrators (8,023)
- Computer Hardware Engineers (5,194 postings)
- Network Systems & Data Comm. Analysts (3,566)
- Telecom Equipment Installers & Repairers (1,700)

Yet, with all of this growth and opportunity, employers are reporting difficulty finding appropriately skilled ICT workers, even in this period of high unemployment! How do we meet this growing demand for ICT talent? Are we forced to hire ICT talent developed abroad, or can we grow our own? This problem is particularly important in San Francisco, which is challenging Silicon Valley as the hub of technology innovation in the Bay Area and U.S.

To develop adequate future ICT workforce, to meet growing demand and compensate for baby boomer retirement job losses, we have to do a better job exposing students to ICT and ICT career prospects early in high school, and even middle school. We need to excite and inspire student engagement and help them understand the high quality careers and lifestyles available in ICT. We must help students become competent ICT Users (digital literacy), a critical success factor in education, no matter the subject, and work, no matter the job. We need to provide students opportunities to cultivate ICT interests, learn ICT technologies, and start on paths to ICT careers - before they lose interest or become discouraged or attracted (or distracted) by something else.



To do that, we need passionate, high quality ICT teachers, up to date with current technologies and workplace practices, and we need affordable student access to modern technologies. We also need coherency across public educational systems, so early K-12 efforts to learn ICT lead

efficiently to related programs in higher education, with educational content aligned to workforce demands and ICT education programs leading directly to high quality ICT jobs.

MPICT has a mission that focuses on improving ICT education with an end state goal of developing this expanding workforce. Understanding, promoting, and improving the pathways to ICT careers will attract and retain the students that will meet the growing needs of ICT workforce employers.

The goal of this project is to better attract and serve students in ICT education, so they become a high quality ICT workforce, so ICT and ICT enabled organizations prosper, to improve the economy – in San Francisco. The goal of this report is to gather and share information on what we have to work with in San Francisco to develop these ICT Pathways to education and work.

## The San Francisco ICT Education and Workforce Landscape

It is increasingly common to hear the term “perfect storm” to describe the ICT sector and its recent boom in San Francisco.

San Francisco is attracting ICT industry employers at a breakneck pace, challenging Silicon Valley as the high status and desirable location for ICT companies and jobs. San Francisco is now home to ICT companies like Digg.com, Jawbone, LinkedIn, Snapfish, Salesforce.com, Twitter and Zynga. In addition, San Francisco hosts many ICT enabled employers, those for whom ICT infrastructure and talent are critical organizational success factors. Last spring, the San Francisco Chronicle reported that one in four nongovernment office jobs in San Francisco is a “tech” job.

Established industry leaders and startups are moving to the City, driven by affordable office leases relative to Silicon Valley, favorable business taxes, and the attractiveness of San Francisco as a place to live and work. According to real estate services firm CBRE Group, Inc., San Francisco boasts the highest tech-jobs growth rate in the nation. Current growth is about double the rate of the next two fastest-growing markets of New York City and Silicon Valley, a boost that's lifted the city's tech jobs to more than 36,600, or 13% higher than the dot-com peak in 2001, according to CBRE.



San Francisco City and County government have strategically targeted attracting and serving “high tech” businesses as an economic development priority, and there are a number of related policies, plans, people and activities underway to improve high tech economic development in San Francisco. The San Francisco Office of Economic and Workforce Development (OEWD) has secured \$8million in grants to support ICT sector coordination and workforce development in San Francisco, and that is an extraordinary amount of money and focus for the ICT sector for a public workforce investment board.

San Francisco Citizens Initiative for Technology and Innovation (sf.citi at [sf.citi.com](http://sf.citi.com)) has been created, as a non-profit organization that supports innovative policies and works collaboratively



with government to find new solutions to historic problems facing San Francisco, and consolidates a voice in promotion of tech sector interests and growth.” The organization already provides an efficient vehicle for engaging more than 320 San Francisco for-profit and nonprofit organizations in ICT sector and pathway efforts.

City College of San Francisco ([CCSF.edu](http://CCSF.edu)), one of the largest higher educational institutions in the U.S. with roughly 90,000 students annually, is leading statewide efforts to improve ICT education and workforce development in community colleges through the Mid-Pacific ICT Center ([MPICT.org](http://MPICT.org)), a National Science Foundation (NSF) Advanced Technological Education (ATE) Regional Center of Excellence, and the California Community College (CCC) ICT Collaborative ([cccict.org](http://cccict.org)), funded through the CCC Chancellor’s office. CCSF offers more than 220 ICT classes, 32 certificates, 10 degrees, numerous labs, and ICT industry certification preparation to more than 8,000 students annually.

San Francisco is home to other higher educational institutions with significant ICT opportunities, including San Francisco State University ([sfsu.edu](http://sfsu.edu)), the University of San Francisco ([USF.edu](http://USF.edu)), Golden Gate University ([ggu.edu](http://ggu.edu)), and Academy of Art University ([academyart.edu](http://academyart.edu)), with numerous other universities in the surrounding Bay Area, including U.C. Berkeley ([Berkeley.edu](http://Berkeley.edu)) and Stanford ([Stanford.edu](http://Stanford.edu)). The first stage of this project focuses on public institutions.

In this “ICT Perfect Storm,” the moment is ripe for broad efforts in the San Francisco community to develop and improve ICT educational and career pathways. San Francisco can keep pace with this demand if our education system continues to move future ICT workers into the pipeline. In order to create this strategic workforce, we have to do a better job exposing students to ICT and ICT career prospects early in high school and even middle school. We need to provide them with opportunities to cultivate that interest and begin to take the path to ICT careers before they lose interest or become discouraged or attracted (or distracted) by something else. We also need to create coherency across public educational systems, so early K-12 efforts to learn ICT lead efficiently to related programs in higher education.

## The San Francisco ICT Pathways Project

The Mid-Pacific ICT Center (MPICT) is sponsoring this pilot project to create coherent and effectual K-12 to college to workforce pathways in ICT related fields and programs in San Francisco. The project, funded by the BATEC National Center, will focus on pathway and academy programs at SFUSD, technology access and training at local Community Based Organizations (CBOs), and bridge programs supported by the Broader Community that can lead to ICT programs, courses, certificates and credentials in the five ICT-related departments at CCSF, or at other higher educational institutions. The ultimate goal is to help the San Francisco community develop citizens to participate in the ICT Workforce and enjoy the high quality lifestyles that enables, and help San Francisco employers acquire a competent ICT Workforce locally, all to benefit the San Francisco economy.

This milestone report is to identify what exists today that we can work with in this effort. The vision is to build and implement a model pathway framework that attracts more students to ICT and supports their retention and completion. There is special interest in attracting more special population students from schools with minimal course selection into ICT pathways.

## Goal: Attracting and Preparing Students for ICT Workforce in San Francisco

The ultimate goal of the project is the development and pilot of a pathway framework and supporting elements that increase the number of K-12 students and young adults attracted into ICT subjects and training that lead to successful ICT Workforce careers, by entry into the ICT Workforce directly from high school, by articulating into ICT education at CCSF or other higher educational institutions or by returning to CCSF or other higher educational institutions for additional education after completing higher level degrees or participating in the workforce. There are many pathways to success in ICT.

### Project Timeline

Following is the high-level timeline of planned project efforts:

Timeframe	Deliverable
Spring 2012	Project kickoff to inform, engage and gather ideas from stakeholders. Initiate a plan that places emphasis on near term activity and provides a structure and timeline for adding elements and outcomes along the way. Identification of a core team and committees to perform the project's activities per the plan and schedule.
Summer 2012	Academic and Community Committees comprehensively research and report on what exists in San Francisco today that we can build on, organize existing elements into pathway framework or model(s), prepare to present existing pathways with elements as quick wins, and recommend future activities. Write and distribute report and get feedback from stakeholders about engaging in new and existing projects and activities
Fall 2012 – Spring 2013	Existing pathway(s) promoted. Committees collaborate with engaged stakeholders to produce missing pathway elements and improve pathway function.
Summer 2013	Special pathway events and projects
Fall 2013 – Spring 2014	Existing and enhanced pathway(s) promoted. Collaboration continues to produce missing pathway elements and improve pathway function.
Summer 2014	Special pathway events and projects
Fall 2014 – Spring 2015	Existing and enhanced pathway(s) promoted. Collaboration continues to produce missing pathway elements and improve pathway function.
Summer 2015	Analysis and final reporting
Ongoing	Semi-annual stakeholder meetings and institutionalization of efforts

### Report Format

Creating this inventory of ICT education and career pathways in San Francisco has revealed that we have a rich base upon which to build a comprehensive pathway with many entry points and options. This report begins with summaries of what we learned about entry points, and options and support along the way. It then presents key findings and recommendation for the project's future stages. Finally, detailed fact sheets about the programs and providers are attached as valuable references for stakeholders wanting to engage in related efforts.

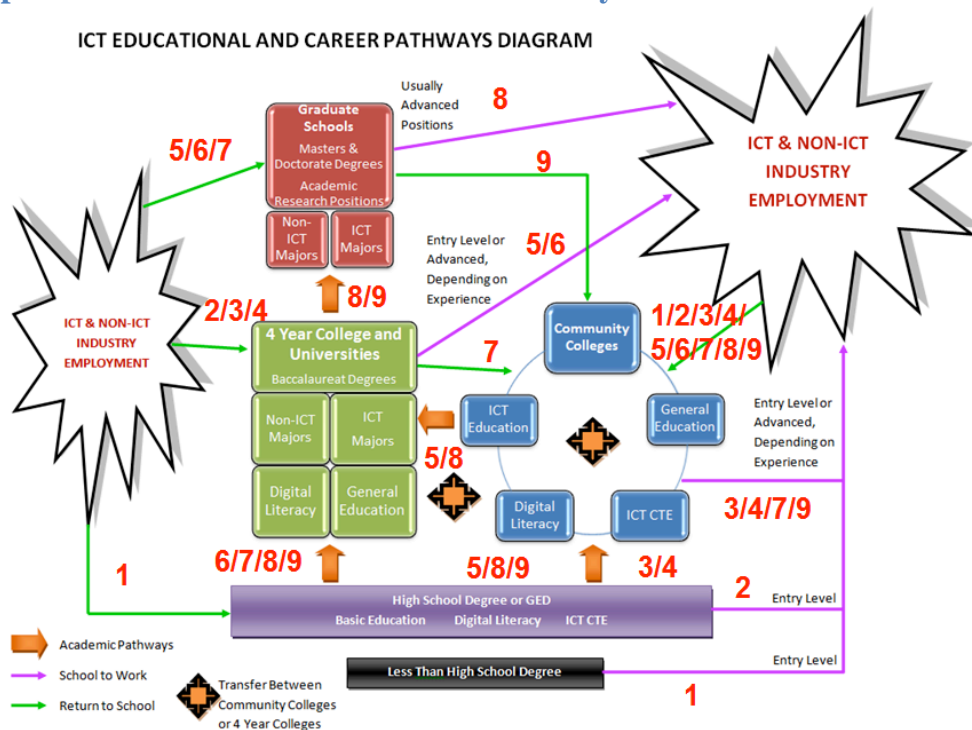
## Existing Pathways to ICT Education in San Francisco



There are a variety of entry points to ICT pathways. For example, a high school sophomore gets introduced to digital media in an elective class supported by Adobe Youth Voice; a single mom finishing her GED at a local CBO hears about an OEWD bridge program where she can continue her education, pursue her interest in social media, and get some work experience; a high school junior starting a two-year academy program learns that if he sticks with it, he'll get community college credit for the technology courses.

There is no single track or pathway to ICT jobs and careers. Rather, there is more complex lattice of ways people get interested in ICT, ways they start learning about it, ways they develop more in-depth knowledge and skills, ways they enter the ICT workforce, ways they continue their ICT education, and ways they advance in their ICT careers.

### A Map of ICT Education and Careers Pathways



1. Some people drop out of high school and pick up ICT knowledge and skills on their own. If they're good, they can succeed. Employers want an ICT workforce that can add value to their efforts. Some people can figure out how to do that on their own. Many find they need more knowledge and skills to advance in their careers, though, or employers screen them out if they

do not have a high school or college degree, and it is painful and not always possible to come back to complete high school or college later. Many of these students end up at community college, and some at 4-year colleges and universities, following one of the paths below.

2. Some people finish high school and go straight to work, without going to college. In some cases, high school Career Technical Education (CTE) programs help them acquire knowledge and skills they can use to get entry level jobs, but they frequently find they need additional knowledge and skills to advance. Many of these end up in community colleges, and some go back to 4-year colleges and universities, following one of the pathways below.
3. Some people go straight from high school to community college. Some of those seek CTE knowledge and skills that allow them to enter the workforce, and that works for them. They complete courses and perhaps get industry certifications that help them get a job.

*Frequently, that was their goal. They never even intended to get an AS degree or academic certification, and they never intended to transfer to a 4-year school. They succeeded in community college, based on their goal of learning what they needed to get a job. However, community colleges have no systematic method for capturing successful student employment outcomes, and therefore this situation may be considered a failure by educational systems, which primarily evaluate community colleges on transfer or academic degree or certificate completion. This is broken.*

Often, however, they find they need additional knowledge and skills or academic credentials to advance in their careers. Many of these end up in back community colleges, and some go back to 4-year colleges and universities, following one of the pathways below.

4. Some people go straight from high school to community college, complete a community college ICT academic degree or certification and then get a job. That's a success for the community college and for the student with that as a goal. To keep up with changing ICT technologies and advance in their jobs, some return to community college for additional course work or certifications, or they find they need additional knowledge and skills or academic credentials to advance in their careers. Many of these end up in back community colleges, and some go back to 4-year colleges and universities, following one of the pathways below.
5. Some people go straight from high school to community college, take ICT and non-ICT related courses, transfer to 4-year colleges and universities and then get a job with an ICT workforce role. That's a success for the community college and the 4-year school. Some of these students end up returning to graduate school or community college for additional study to advance their careers.

*However, most 4-year schools want and accept for credit mostly just general education or standards-based computer science courses. Many computer science and business programs will not accept community college IT courses. That is a major obstacle for technical students with ICT interests, because it is precisely those hands-on ICT courses that attract their interest and which they want to pursue in their careers. Businesses want the technical skills, but they frequently require a baccalaureate degree as a screening mechanism in the hiring process. This pathway is broken for IT subjects. It works pretty well for Computer Science programs.*

6. Some students go straight from high school to a 4-year college or university. They get a baccalaureate degree in an ICT or non-ICT related discipline and find a job that includes an ICT workforce role. Some of these students will end up returning to graduate school or community college for additional study to advance their careers.
7. Some students go straight from high school to a 4-year college or university. They get a baccalaureate degree in a non-ICT academic field and discover that it is difficult to get a job in their field when they are done. They learn that ICT workforce skills are in high demand and take classes at a local community college to learn those skills. With a combination of baccalaureate degree and technical knowledge and skills, perhaps demonstrated with industry certification(s), they find meaningful employment that includes an ICT workforce role.

*In some cases, even graduates from traditional theory-based Computer Science programs end up going through community college hands-on courses before they find a place in the workforce, because many jobs in IT roles in organizations demand those skills. Completion of a community college academic credential is not their goal. When they get the ICT knowledge and skills they need and get a job, they meet their goal and succeed. However, they are frequently counted as failures for community colleges by current academic completion or transfer evaluation metrics.*

8. Some students who transfer from community colleges or go directly to 4 year colleges and universities go on to complete graduate degrees in ICT related fields. Many of them go on to work in ICT industry in R&D and other advanced roles.
9. Some students who transfer from community colleges or go directly to 4 year colleges and universities go on to complete graduate degrees in non-ICT related fields. Frequently, when they try to find jobs, however, they find that employers want ICT technical knowledge and skills that these schools do not provide – even for students in Computer Science programs. Many of these people go to community colleges with advanced degrees to get knowledge and skills they don't have but need for productive employment.

*Completion of a community college academic credential is not their goal. When they get the ICT knowledge and skills they want, they meet their goal and succeed. However, they are counted as failures for community colleges by current academic completion or transfer evaluation metrics.*

10. It is not on the diagram, but people who go through any of these tracks may end up teaching ICT related subjects in K-12 schools, community colleges, 4-year colleges or universities. There are inconsistencies in the requirements for those teachers. Many have not worked, at least recently, in real world businesses and have difficulty knowing what current ICT workforce demands and realities are. There is a real need to provide ICT related teachers current, real world ICT employment experiences, so they can shape their courses, programs and instruction to meet current workplace demands.

No matter their education or work background, many working or unemployed professionals come to community colleges to keep up with rapidly emerging and evolving ICT technologies. Their employer may not be willing to pay high price “boot camp” training fees charged by private training organizations, and they can't or won't pay those fees on their own, but they need those skills to advance. Again, completion of a community college academic credential is not their goal. When they get the ICT knowledge and skills they need and get a job or advance in their careers, they meet their goal and succeed. However, they are often counted as failures for

community colleges by current academic completion evaluation metrics. Anecdotally, as many as half of students in some ICT related programs are in this category.

Finally, for many, exposure and training in ICT come through community based organizations or programs outside of public education in the broader community.

Following are key landmarks on the map; the student and citizen touch points in ICT education, workforce development, and careers in San Francisco. These are potential participants, collaborators and strategic partners for improving pathways to ICT education and the workforce in San Francisco.

## Educational Institutions:

### ICT at San Francisco Unified School District (SFUSD)

*This section of the report summarizes ICT options at SFUSD high schools. The study was focused identifying a number of target areas:*

1. *What ICT courses are currently available in SFUSD High Schools?*
2. *What schools are currently offering ICT courses?*
3. *What is the demographic of students enrolled in these courses?*
4. *What lab facilities are available at the individual high schools?*
5. *What key partnerships are taking place within individual schools?*
6. *Are students participating in internships?*

*These six criteria provide an overview of the fact sheets about individual schools in the appendix while also producing a comprehensive catalog of SFUSD opportunities.*

### SFUSD, Mission, Vision, Beliefs and Goals

San Francisco Unified School District is as unique in course offerings as it is in student demographics. Being the only district in both the City and County of San Francisco, (SFUSD) serves approximately 55,000 K-12 students through 131 institutions. SFUSD's strategic plan *Beyond The Talk 2.0*, first approved in 2008 adopted a Mission; Vision; Beliefs and Goals to guide the school district.



#### **Mission:**

Provide each student with an equal opportunity to succeed by promoting intellectual growth, creativity, self-discipline, cultural and linguistic sensitivity, democratic responsibility, economic competence, and physical and mental health so that each student can achieve his or her maximum potential.

#### **Vision:**

Every student who enrolls in our schools will graduate from high school ready for college and careers and equipped with the skills, capacities and dispositions necessary for 21<sup>st</sup> century success.

#### **Beliefs:**

- ✓ The achievement gap is the greatest civil rights issue facing the district

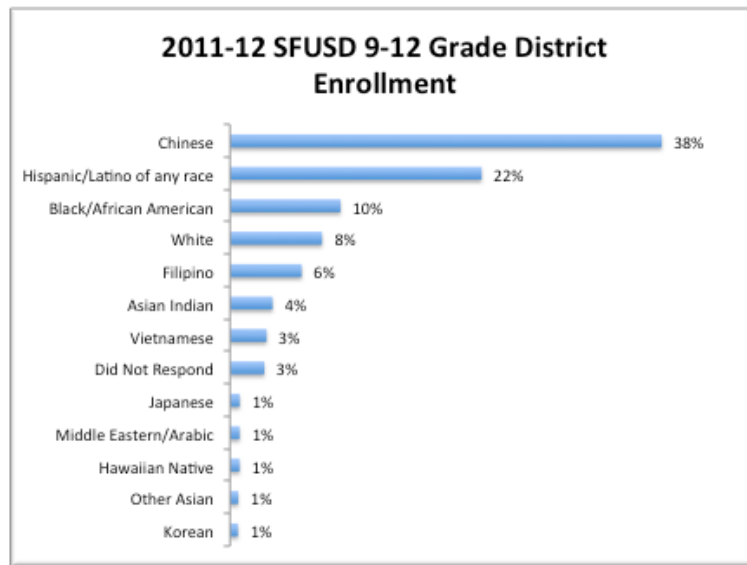
- ✓ It is possible to increase achievement of high performing students and accelerate achievement of those currently less academically successful
- ✓ Quality Schools have engaging and challenging material, caring and committed staff, strong and visible leaders, and instruction differentiated to meet each child's need
- ✓ Authentic partnerships are essential to achieving our vision for student success

**Goals:**

1. **Access and Equity** – make social justice a reality by ensuring every student has access to high quality teaching and learning
2. **Student Achievement** – create learning environments in all our schools that foster highly engaged and joyful learners and that support every student reaching his or her potential
3. **Accountability** – Keep our promises to students and families and enlist everyone in the community to join us in doing so

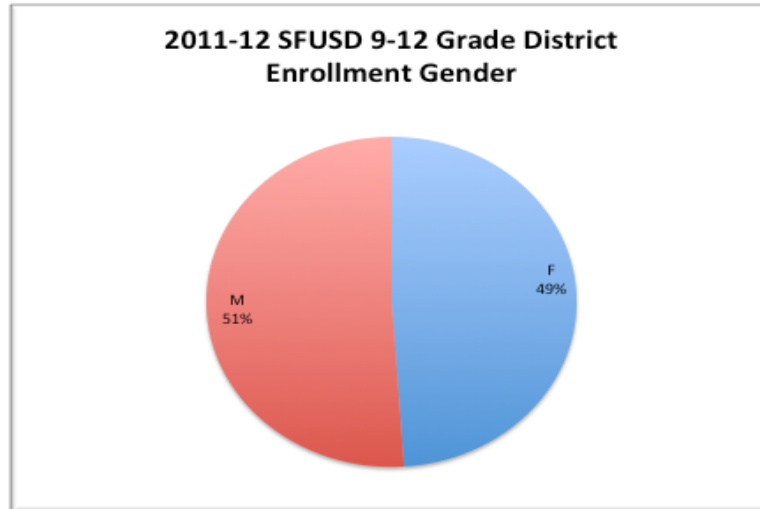
With these four umbrellas in mind San Francisco Unified is adopting the Common Core State Standards in English Language Arts and Mathematics while ensuring through the UC/CSU, A-G standards that every student is both college and career ready by 2015.<sup>1</sup>

SFUSD high school enrollment for 2011 - 2012 was approximately 17,000 extraordinarily diverse students.



\*Hmong, Tahitian, Guamanian, Laotian, Cambodian, Other Pacific Islander, Samoan, Am. Indian represent less than 1% of total population and are not displayed in this graph.

<sup>1</sup> Information obtained from Beyond the Talk 2.0 and Walking the Talk 2012, www.sfusd.edu



**SFUSD High Schools at a Glance:**

SFUSD high schools are segmented into comprehensive, alternative, charter, county and continuation high schools. Each school offers an array of courses and support services that aim to meet the specific needs and situation of each student.

**SFUSD High Schools:**

**Alternative:**

- Academy of Arts & Sciences
- Independence High School
- International Studies (6-12)
- June Jordan School for Equity
- PCC/Big Picture San Francisco
- Ruth Asawa School of the Arts (SOTA)
- SF International High School

**Comprehensive:**

- Balboa High School
- Burton High School
- Galileo High School
- George Washington High School
- John O’Connell High School
- Lincoln High School
- Lowell High School
- Mission High School
- Thurgood Marshall High School
- Wallenberg High School

**Charter:**

- City Arts & Technology (Envision)
- Five Keys
- Gateway High School
- Leadership High School
- Life Learning Academy
- Metropolitan Arts and Tech (Envision)

**County Schools:**

- Civic Center Secondary School
- Early Morning Study Program
- Hilltop High Special Services
- Larkin St. Youth Services
- Log Cabin Ranch
- Walden House
- Woodside Learning Center

**Continuation:**

- Downtown High School
- Ida B. Wells

**SFUSD ICT Programs:**

While there is no defined IT or ICT (except AP Computer Science) curriculum in San Francisco Unified certain trends are apparent through an examination of course enrollment and clusters. The most detrimental factor to course offerings relies upon the teacher. As most offerings are electives



it is dependent upon the teacher to create, develop, enhance, disseminate and deliver the curriculum. While there are California State Career Technical Education Standards, there is not a strong infrastructure or process in place at San Francisco Unified to identify what courses should be offered or will be offered in anticipation of San Francisco County employment trends. Through the work with “Bridge to Success” it is a component to “align sector pathways from high school, GED or Bridge Programs to and through academies at CCSF”<sup>2</sup>

### **Academies & Pathways:**

There are 12 ICT related Academies or Pathways in San Francisco Unified School District that offer at least a 2-year sequence of courses (some offer a 3-year sequence) focused in either Broadcasting, Digital Media, Programming, Information Technology or Business. Career Academies and Pathways are high-school programs that integrate students learning in school with real-world opportunities to increase student motivation and achievement. According to The California Center for College and Career, “Pathways that link learning with student interests and career preparation lead to higher graduation rates, increased college enrollments, and higher earning potential.”

Career Academies enlighten students to different career fields, motivate them to think about their personal college and career path and develop key 21<sup>st</sup> century pre-professional skills. Career academies feature cross-curricular projects focused on specific career industry themes and academic topics. The Academy/Pathway courses stress hands-on, project based learning to provide a more authentic, real-world educational and work-based learning experience for students.



### **Academies Related to ICT Pathways:**

#### **Broadcasting & Digital Media:**

- Balboa High School (CAST)
- Galileo High School
- Ruth Asawa School of the Arts
- Philip & Sala Burton High School
- George Washington High School

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<sup>2</sup> P.11 San Francisco Unified School District, “Beyond the Talk 2.0” 2008

**Business & Finance:**

- Abraham Lincoln High School
- Philip & Sala Burton High School

**Computer Programming & Information Technology:**

- Balboa High School
- Galileo High School
- John O’Connell High School
- Lowell High School

**SFUSD Enrollment & Courses:**

With an approximate grades 9-12 enrollment of 17,500, there are plenty of students that could be attracted into ICT fields.. ICT course availability is different in different high schools. Most ICT related courses are taken as electives, which limits the number of available sections that can be offered in a day. For Computer Art & Media Art, which meets the Art requirement for high school graduation, the enrollment is much greater. Having more ICT related courses meet graduation requirements, UC a-g requirements or be required as part of academic standards and/or standardized testing would all likely increase ICT related enrollments.

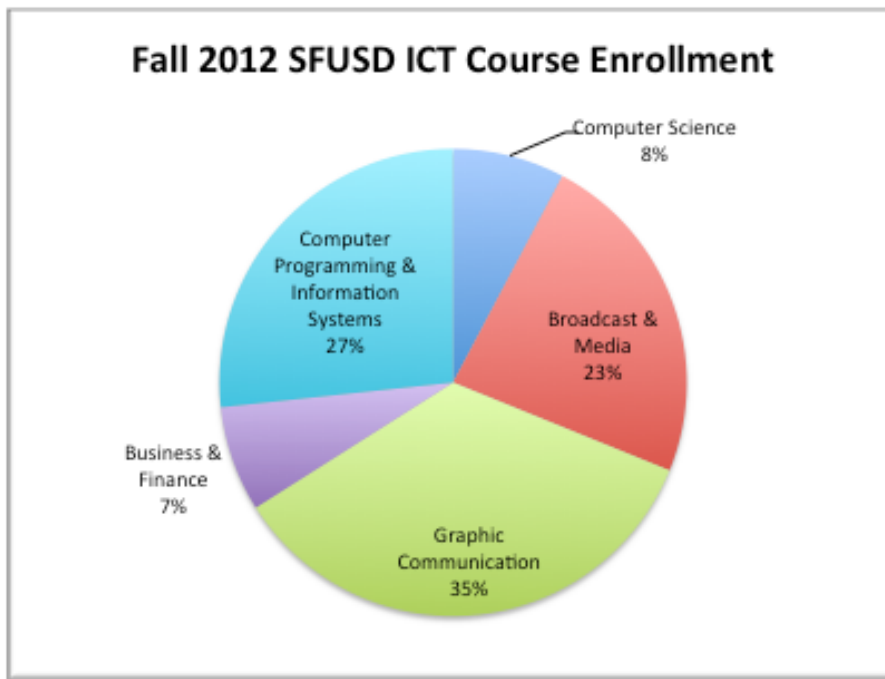
Following are SFUSD high school courses categorized by the most relevant department at City College of San Francisco.

<b>CCSF Related Department:</b>	<b>Course:</b>	<b>2012 Enrollment:</b>
Computer Science		136
	AP COMP SCI 1	136
Broadcast & Media		410
	MEDIA ARTS 1	176
	MEDIA ARTS 2	15
	MEDIA ARTS 3	67
	MEDIA ARTS 5	9
	MULTI-MEDIA 1	58
	NEW TECH LAB 1	26
	VIDEO PRO ED A1	59
Graphic Communication		611
	ANIMATIONS 1	38
	ANIMATIONS 3	33
	COMPUTER ART 1	447
	COMPUTER ART 3	93
Business & Finance		126
	BANK & CREDIT	23
	FINANCIAL PLAN	3
	INTRO FINANCIAL	46
Computer Programming & Information Systems		468
	C PROGRAMMING 1	115
	COMP INTRO 1	7
	COMPTR PROG 1	119
	COMPTR PROG 2	5
	COMPTRSCAREERS	26
	DIGITAL MEDIA 1	1
	Computer Science	136

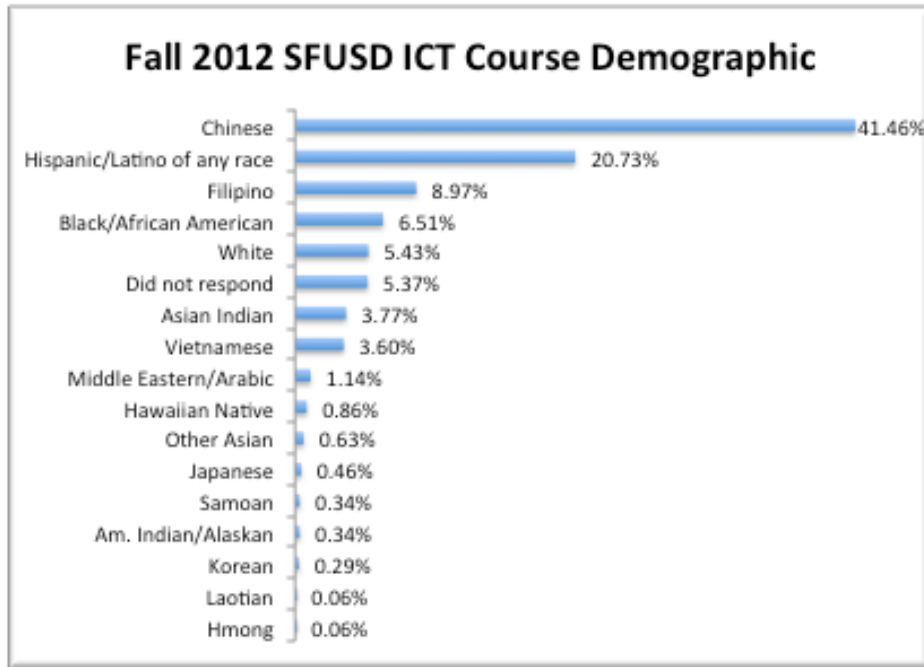
	AP COMP SCI 1	136
Broadcast & Media		410
	MEDIA ARTS 1	176
	MEDIA ARTS 2	15
	MEDIA ARTS 3	67
	MEDIA ARTS 5	9
	MULTI-MEDIA 1	58
	NEW TECH LAB 1	26
	VIDEO PRO ED A1	59
Graphic Communication		611
	ANIMATIONS 1	38
	ANIMATIONS 3	33
	COMPUTER ART 1	447
	COMPUTER ART 3	93

**SFUSD ICT Related Course Distribution:**

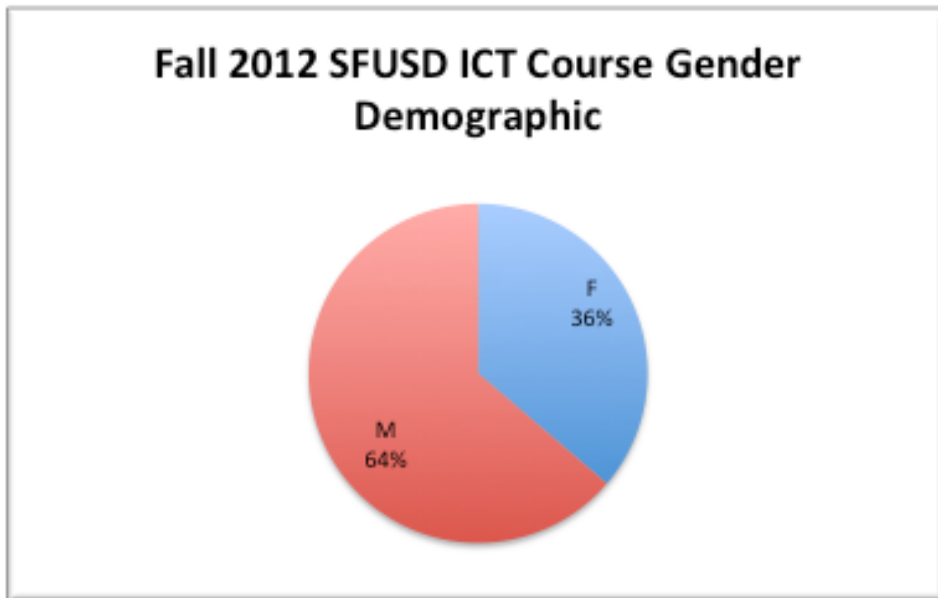
1,751 Students



**ICT Course Ethnicity Demographics:**  
1,751 Students



**ICT Course Gender Demographics:**  
1,751 Students



**ICT at City College of San Francisco (CCSF)**

*This section of the report summarizes the ICT certificates and degrees at CCSF, programs and facilities that provide pathway support, the students benefiting from them, and department and faculty resources involved in delivery.*

City College of San Francisco (CCSF) is among the oldest and largest community colleges, enrolling more than 90,000 students each year and delivering over 4,700 courses at nine campuses and many other sites throughout San Francisco. CCSF's 42 administrators and 905 classified employees assist 819 full-time and 1,032 part-time faculty, 95 percent of whom have master's degrees, with nearly 250 holding doctorates, in delivering courses in more than 50 academic programs and over 100 occupational disciplines. The College's programmatic breadth and variety, and its prominence in the city's ethnic neighborhoods, result in the highest market penetration of any community college in the country. CCSF offers an affordable opportunity to earn associate degrees, prepare for transfer, and pursue career and technical education. City College also offers distance learning and free noncredit courses in many fields.



It is not surprising that City College of San Francisco (CCSF), the largest community college in the San Francisco Bay Area, offers a wide range of courses, programs, certificates and degrees for students interested in Information and Communications Technologies (ICT).

### **CCSF ICT Programs**

The ICT programs and degrees at CCSF reflect the skills and knowledge in demand in a variety of industries and aim to usher students into these lucrative fields. With more than 220 classes, 32 certificates, 10 AS/AA degrees and numerous opportunities to prepare for industry certifications, the more than 8,000 students who enrolled in CCSF ICT classes in 2010-11 had many options to choose from. Five CCSF departments offer ICT related courses, ranging from introductory and entry-level to advanced professional development.

- Students interested in broadcast sound, video design and production and motion graphics will find classes and programs in the **Broadcast Electronic Media Arts Department (BEMA)**.
- Future designers and technical specialists, who want to focus on graphic design and production, including careers in the web, game and animation industries, will find classes in the **Graphic Communications Department (GRPH)**.
- Those who want to develop software, including programming for databases, LAMP (Linux, Apache, MySQL and PHP/Perl/Python or Ruby) or iPhones and Android devices, would investigate classes in the **Computer Science Department (CS)**.
- The **Computer Networking and Information Technologies Department (CNIT)** is another fast-growing field that is popular with student and includes technical support, web site development, networking, Cisco routing and switching and network security.

- Business-minded students looking to start their studies in administrative support or office technology would explore classes and programs in the **Business Department (BUS)**.

**CCSF ICT Related Department Statistics (2010-11)**

<b>Department</b>	<b>Students</b>	<b>Certificates</b>	<b>Degrees</b>	<b>Transfer</b>	<b>Faculty</b>	<b>Dual Enrollment</b>
BEMA	809	35	0	35	13	0
BUS	1757	6	0	76	16	0
CNIT	2695	101	22	77	20	35
CS	1952	29	8	81	16	26
GRPH	1283	25	7	21	29	29
<b>TOTAL</b>	<b>8496</b>	<b>196</b>	<b>37</b>	<b>290</b>	<b>94</b>	<b>90</b>

**Transfer to Other Colleges and Universities:**

Students who complete the two-year Associate in Science or Arts degree programs may choose to continue their education and earn a Bachelor’s Degree. CCSF has transfer agreements with many of the California State University and University of California campuses.

All ICT majors consist of completion of the General Education requirements along with additional units of required courses from the individual area of study. Each of the individual CCSF department fact sheets in the Appendices outlines the requirements for a degree in the major of study.

**Certificates:**

Academic certificates are offered in all of the ICT departments at City College. The department fact sheets on the following pages outline the individual certificates and their requirements for each area of study.

Certificates are often the best choice for those who already have a degree in a different discipline and want to gain credentials in a specific area of ICT. Beginning students will find that, for many fields, the classes also provide the skills and knowledge required for entry-level employment for those who don’t have a degree already.

**Admission:**

Enrollment is open to all interested students. Please note that some classes have prerequisites, co-requisites and advisories.

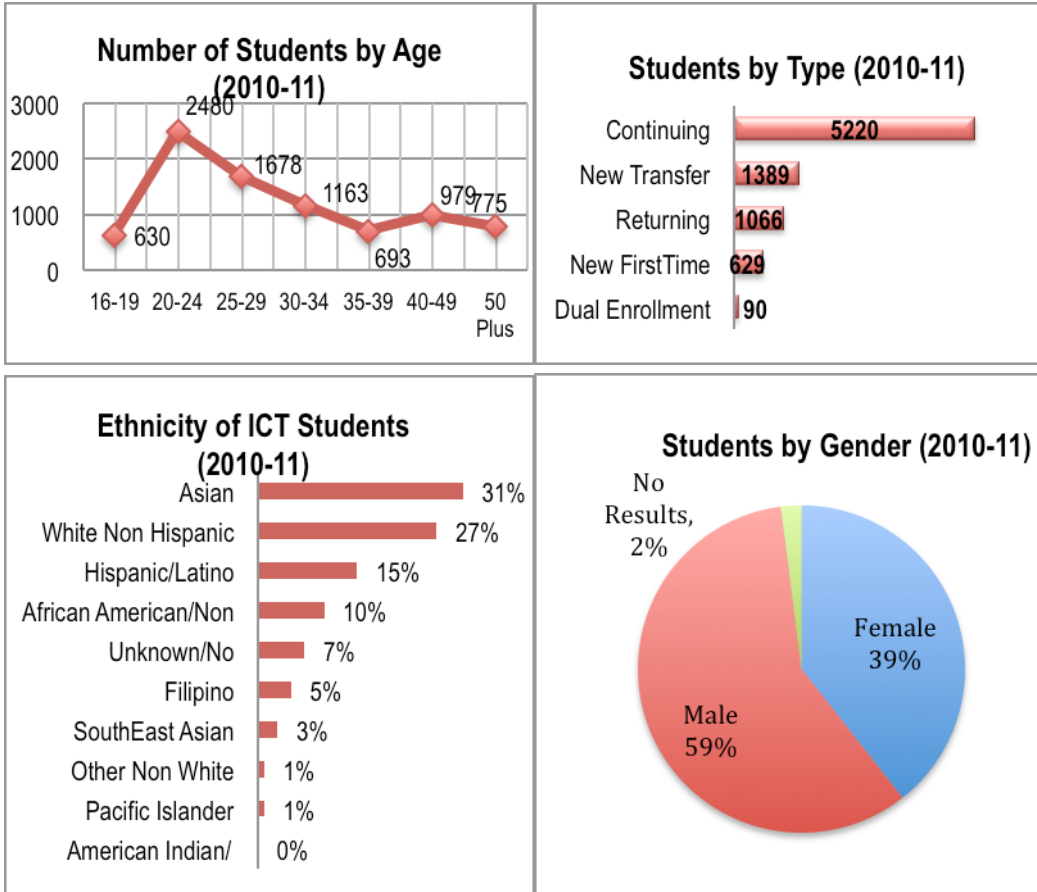
If students are interested in combining areas of study among the ICT departments, they should meet with a counselor to discuss their specific interests. Advisors in each department will also help direct students to particular areas of study that correspond to their career or educational goals.

**Tuition:**

Tuition is an affordable \$46 per academic unit.

**Students:**

Approximately 8,400 students a year enroll in an ICT class at CCSF. In 2010-11, 7 percent of the students who enrolled in ICT classes were first-time students.



**Certificates, Degrees and Transfers:**

CCSF ICT certificates and degrees awarded in 2010-11: 233

CCSF ICT students who transferred to a four-year school in 2011: 290

**Internships and Programming:**

Internship and work-experience courses are available for supervised on- or off-campus work in most of the departments. CCSF sees internships as an essential pathway for students to gain important work experience in their field of interest.

**Employment and Income:**

Detailed information about the type of jobs and income expected in ICT field can be found on CCSF’s Career and Technical Education Program FAQ web page: <http://goo.gl/136Uw> or linked from the MPICT web site at: [www.mpict.org/ict\\_employment\\_section.html](http://www.mpict.org/ict_employment_section.html)

**Dual Enrollment Options:**

All of the ICT departments have offered specific dual enrollment courses for high-school students. In past years, these have included:

- BCST 110: Writing for Electronic Media

- BCST 119: Digital Media Skills
- BCST 120: Audio Production
- BCST 135: Sound for the Web
- BCST 136: Video for the Web
- CNIT 131: Internet Basics and Beginning HTML
- CNIT 120: Network Security
- CNIT 106: Intro to Network
- CS100: Introduction to Computer Science
- CS101: Introduction to Information Systems
- CS110A: Introduction to Programming: C++
- CS111A: Introduction to Programming: Java
- GRPH 25: Digital Skills for Visual Media
- GAME 100: Exploring Game Worlds
- MMSP 110/GRPH 23: Orientation to Graphics and Multimedia

**Number of high school students enrolled in CCSF ICT classes in 2010-11: 90**

**CCSF ICT Faculty and Staff:**

Faculty: 94

Staff: 16

**CCSF Computer labs:**

- ICT departments at CCSF have 31 computer labs spread across the Downtown, Mission and Ocean campuses. This includes Macs and PCs, computers and parts for hardware classes, hardware and software for Cisco labs, Adobe, Microsoft and Apple software for Broadcast, Business, Design and Multimedia students and printing and open-lab areas.
- CCSF also has digital video-editing labs, audio-production labs, sound recording studios, radio stations, digital television studios, field video cameras, microphones and lighting kits for student checkout.
- The Academic Computing Resource Center (ACRC) on the Ocean Campus has 130 PCs and 40 Macs for supporting students enrolled in Information and Communication Technologies (ICT) classes.

**CCSF Campuses:**

CCSF ICT related classes are taught on the Mission, Downtown and Ocean campuses. Many online classes are also available.

**Advisories:**

Each ICT related department has at least one advisory group that helps provide feedback about what curriculum is relevant. These groups meet each year and are required to confirm that the departments are teaching content that aligns with industry standards.

**For More Information contact:**

Pierre Thiry  
 50 Phelan Avenue, Room S147  
 San Francisco, CA 94112  
 Telephone: (415) 239-3594



E-mail: [pthiry@ccsf.edu](mailto:pthiry@ccsf.edu)  
Web site: [www.ccsf.edu/mpict](http://www.ccsf.edu/mpict)

## ICT at San Francisco State University (SFSU)

*This section is a very brief overview of SFSU and a list of ICT pathway options for students interested in articulating to a San Francisco public university that offers bachelor and master degrees in ICT-related fields.*

For more than 100 years, San Francisco State University has played key roles in shaping our city and the surrounding Bay Area. It is an institution driven by a commitment to student success and a commitment to our local and global communities.

Part of the California State University (CSU) system, SFSU offers at its 142 acre main campus, Downtown campus and 42-acre Tiburon campus:

- Bachelor's degrees in 78 academic areas with an additional 46 areas of concentration
- Master's degrees in 62 academic areas with an additional 42 areas of concentration
- Doctor of Education (Ed.D.) in Educational Leadership
- Ph.D. in Education with a concentration in special education, jointly with University of California, Berkeley
- The clinical doctorate. Doctor of Physical Therapy (D.P.T.), and a research doctorate for licensed physical therapists (D.P.T.Sc.), jointly with University of California, San Francisco

SF State also offers 17 credential programs and 35 certificate programs.

SFSU serves almost 30,000 students annually with a faculty of around 1,600, staff of more than 1,500, 11 counselors and more than 400 academic student employees.

Tuition and fees are around \$3,500 per semester for a full-time student.

San Francisco State University offers ICT-related degrees through the following departments:

### College of Business

- [B.S. – Business Administration with Concentration in Decision Sciences](#)
- [B.S. – Business Administration with Concentration in Information Systems](#)
- [Minor in Business Information Systems](#)
- [Certificate in Information Technology Auditing](#)
- [M.B.A. with Emphasis on Decision Sciences/Operations Research](#)
- [M.B.A. with Emphasis on Information Systems](#)
- [M.A. – Education with Concentration in Instructional Technologies](#)
- [Certificate in Training Systems Development](#)
- [Credential Supplement in Instructional Computing for K-12 Teachers](#)
- [Certificate in E-Learning Development](#)

### College of Education: Instructional Technologies

- [Department of Computer Science](#)
  - [B.S. – Computer Science](#)
  - [Minor – Computer Science](#)
  - [M.S. – Computer Science](#)
  - [M.S. – Computer Science with Concentration in Computing and Business](#)
  - [M.S. – Computer Science with Concentration in Computing for Life Sciences](#)
  - [M.S. – Computer Science with Concentration in Software Engineering](#)
- [School of Engineering](#)
  - [B.S. – Computer Engineering](#)
  - [B.S. – Electrical Engineering](#)
  - [M.S. – Engineering with Concentration in Embedded Electrical and Computer Systems](#)
- [College of Humanities](#)
  - [B.A. – Technical and Professional Writing](#)
  - [Minor – Technical and Professional Writing](#)
  - [Certificate in Technical and Professional Writing](#)

Students that have completed college units after graduation from high school may transfer as junior or senior (upper division) transfer students. These transfer students must have completed 60 or more transferable semester units (90 quarter units). SF State is not currently accepting applications from lower division transfer students (freshman or sophomore students that have completed less than the required transferable units).

**Contact:**

E-mail: [sfsuinfo@sfsu.edu](mailto:sfsuinfo@sfsu.edu)

## ICT at Community Based Organizations and in the Broader Community

### Community Based Organizations (CBOs)

The SF ICT Pathways Project identified and collected information about existing San Francisco programs and services that train young people in the use of technology. This includes programs offered by Community-Based Organizations (CBOs) and programs they delivered funded by local government agencies. Locations where there is computer access without a formal training program is also noted.

Pendergrass Smith Consulting (PSC) was contracted to collect information about CBOs that provide training to young people in the use of technology. To get this information, PSC identified youth-serving agencies funded by DCYF, OWED, MYEEP, and local philanthropic foundations in San Francisco. CBOs that did not provide computer/technology training were eliminated from the list and a web search was conducted to ascertain what specific computer/technology training were offered. It was later decided that all CBOs that had computers accessible to youth would also be included. Programs with computer access without training are included as a table at the end of the inventory that closes this report.

After documenting information about computer/technology programs from the websites, calls were made and emails sent to CBOs to get more information by asking the following questions:



1. What type of ICT training do you provide?
2. Who do you serve?
3. What are the criteria to enter?
4. What is the pathway to education and/or employment?

Out of more than 50 calls and emails, only a few agencies responded. The low response may have been because contact was attempted in early August when summer programs were winding down or had already ended, because program directors did not have the time to answer the questions, or because they were unfamiliar with the organization requesting the information or the topic itself. A description of each program was drafted (based on website information) and emails sent to each agency in late August asking that they edit the information to more accurately represent their programs. This method had a better response, but still with only 12 CBOs responding.

Descriptions of 25 relevant CBO programs are included in [Appendix 7](#). Twelve of those responded to requests for information categorized in the following table of types of information:

Type of Organization	Provides ICT-related Training	Provides Technology Access
Arts & Culture		1
Youth Education	1	2
Job Training	2	2
Youth Services	4	1
Youth Services - Girls		2
Youth Services & Job Training	1	1
Youth Education & Job Training	8	
ICT Education	1	

With 17 CBOs doing providing training that ranges from office productivity tools to digital video editing, there’s opportunity to promote and attract these constituents on to the pathway to any of the programs at CCSF. Please see the appendices for details on these relevant CBO programs.

### Broader Community

The Broader Community includes the City and County of San Francisco, businesses and industry organizations, all of which have an interest in aligning workforce development with the demands of employers. Project team members contacted representatives and scoured websites to identify and describe programs and activities that provide opportunities for youth to enter and be successful in their pursuit of ICT careers. The following table summarizes what has been identified thus far:

Organization	Programs/Initiatives	Partners
Office of Economic and Workforce Development	<b>Bridge to Success</b> – blends academic skills support and workforce development to promote school achievement and the relevance of education in accessing career opportunities	San Francisco Unified School District (SFUSD), City College of San Francisco (CCSF), San Francisco State University, San Francisco School Alliance, San Francisco Education Fund, Bill & Melinda Gates Foundation, Microsoft, and Evelyn & Walter Haas, Jr. Fund
	<b>TechSF</b> - offers training in high growth IT occupations that are currently in demand, including Networking, Tech Support, Programming, and Multimedia, to prepare SF residents for entry into careers in ICT	US Department of Labor, BAVC, CCSF, BAYCAT, Year Up Bay Area, West Ed
	<b>Summer Job+</b> - meaningful job opportunities for via summer employment for youth and young adults	Mayor’s Office, United Way of the Bay Area, SFUSD,
Career Ladders Project	<b>California Linked Learning District Initiative</b> – linked learning between high school and post-secondary institutions	ConnectEd and the James Irvine Foundation
	<b>Concurrent Courses Initiative (CCI)</b> - demonstrates the feasibility of using dual enrollment programs to enhance college and career pathways for low-income youth who are struggling academically or historically underrepresented in higher education.	James Irvine Foundation, eight secondary and postsecondary partnerships in California
Japanese Community Youth Council (Fiscal Agent)	<b>Mayor’s Youth Employment and Education Program</b> - support the positive development of youth in San Francisco by engaging them in meaningful employment, career, leadership, and community involvement opportunities.	Bernal Heights Neighborhood Center, Buchanan YMCA, Community Youth Center, Horizons Unlimited, Jewish Vocational Services, Vietnamese Youth Development Center, Youth Community Developers
San Francisco Citizens for Technology and Innovation (sf.citi)	<b>SummerQAamp</b> - a nationwide initiative to train U.S. youth in high-tech skills like QA.	College Track
	<b>Mayor’s Summer Jobs+ Challenge</b> – Mayor Lee challenges San Francisco business leaders to pledge jobs or sponsor summer internships. sf.citi has committed to placing 100 young San Franciscans in summer internships at member	Mayor’s Office, sf.citi members

Organization	Programs/Initiatives	Partners
Year Up	companies	
	<b>Future Graduates Program</b> - enhance high school youth access to real-world job training by placing students at innovative SF-based tech companies in paid summer internships	San Francisco Police Department, SFUSD, Pathbrite, Jawbone, Giggo, 6waves, Hipmunk, Sincerely, Zozi, Black Founders, Cloudera, Zoosk, blackgirlsCODE, Viumbe
	<b>Year Up By Area</b> - one-year, intensive training program that provides low-income young adults, ages 18-24, with a combination of hands-on skill development, college credits, and corporate internships	CCSF, Wells Fargo, PayPal, FM Global,

More information on broader community based programs is included in [Appendix 8](#).

Initiatives led by broader community organizations create the relationships between education, the community, and businesses that bring together activities that, working together, can be far more effective with collaboration.

## Opportunities, Findings and Recommendations

*What follows are ideas and opportunities for improving ICT Pathways in San Francisco; key findings that stood out during the collection of this information in regards to access and opportunities for students and young adults to embark upon a path to an ICT career; and some initial ideas and recommendations for leveraging what was learned.*

### Opportunities to Improve ICT Pathways in San Francisco

Among many ideas, possibilities, examples and known successful practices for improving ICT education and career pathways in San Francisco are:

- **Creating and implementing Digital Literacy Standards and Curriculum in K-12**
  - The ability to work with ICT, at least as a User, is increasingly as important to student and workplace success as reading, writing and arithmetic. What is it we should expect all K-12 students to know and be able to do with respect to ICT? How can we comprehensively assure that students are getting that at SFUSD?
- **Developing and implementing Middle or High School Intro to ICT Courses**
  - If we are going to recruit the numbers of students we need to meet future ICT workforce demands, we have to do a better job of attracting their interest early. Introductory courses in middle school that include exposure to and experience with cool ICT technologies, ICT career exploration and hands-on digital literacy skills could help generate student interest and attract them into ICT pathways.
- **Creating ICT Summer Camps for K-12 Students**
  - It is much easier to create shorter events for kids than to change standards and curriculum and get approval for new courses. Summer events are great opportunities to expose young people to ICT technologies and career prospects. They can be fun and engaging for everyone.
- **Collaborating to Produce ICT Recruiting Events and Fairs**
  - We need to attract more people into ICT education and career pathways. We can collaborate as stakeholders to produce various special events to recruit students into ICT courses, clubs, CBOs, programs and resource centers. Different events can be at different locations, with different stakeholder participation.
- **Deploy More Computer Science/Engineering classes in SFUSD High Schools**
  - Four-year colleges and universities argue that we are not attracting enough students into academic pathways leading to baccalaureate and higher degrees in Computer Science and Computer and Electrical Engineering. Without ICT scientists and engineers in the future, we will not have enough people to advance ICT technologies and fields that drive the innovation economy of the 21<sup>st</sup> century. That is true. We can work to get more of these courses offered in

SFUSD high schools. Exploring Computer Science and AP Computer Science courses are particularly good candidates.

- **Adopt California Department of Education ICT CTE Standards and Resources**
  - The California Department of Education is approving relevant CTE standards, which have just been renamed ICT. It is easier and creates better results across the California economy as a whole if K-12 ICT courses are delivered consistently. CDE has a lot of resources to improve K-12 ICT education. We can help SFUSD high schools learn about and implement CDE ICT curriculum and resources.
- **Develop and Offer More High School ICT Related Classes**
  - Some SFUSD high schools do not offer any ICT related classes. Clearly, students would have more opportunities to enter ICT Pathways if they did. We can work to create more ICT related classes to fill those gaps.
- **Work to Align ICT Curriculum Across Institutions**
  - Many of the ICT related classes offered in San Francisco were created and are delivered in isolation. They do not map well to each other, and they are not well known by others. If faculty, teachers and other stakeholders would get together and align their curriculum, that would facilitate transfer and articulation and provide an ICT workforce with better known and consistent knowledge and skills.
- **Increase ICT Related Articulation Agreements in San Francisco**
  - Formally aligning ICT related curriculum makes academic transfer work better. More ICT articulations is better. We can work to create more.
- **Build Relationships between ICT Related Faculty, Counselors and Administrators**
  - ICT is hard to keep up with. Technologies and business implementations of them develop very rapidly. There are many different ways of delivering ICT education and workforce development. There are all kinds of possible benefits to having the ICT education and workforce development community get to know each other, share information, serve as subject matter experts and advisors to each other, and talk about things in the same ways. We could create those opportunities.
- **Increase Number of ICT Related Dual Enrollment Courses Offered**
  - Dual enrollment courses give high school students college credit for courses taken in high school. College credit is a powerful incentive for high school students to take classes. The more of these we offer, the more choices high school students have for learning ICT. These are particularly powerful in high schools where students have few ICT related course choices at the college itself. We can create more of these to better serve the San Francisco community.
- **Increase Number of High School Students Taking ICT Dual Enrollment Courses**

- Many high school students do not understand dual enrollment course opportunities well, and enrollment in these classes is inconsistent across high schools. A simple and powerful opportunity is to help students understand these opportunities better and proactively and competently recruit high school students to take these classes.
- **Increase Number of High School Students Taking ICT Concurrent Enrollment Courses**
  - It is possible for high school students to simply enroll in community college ICT classes, while they are still in high school. Many of them do not know that. We could proactively recruit high school students to take community college ICT classes under concurrent enrollment agreements.
- **Expanding and Developing “Bridge to ICT” Programs**
  - There are good jobs available to competent ICT workers, even without advanced degrees. There are many drop-outs, people returning to work and people changing careers who can be retrained for ICT jobs. Many require additional education and services, to meet academic math, writing and science requirements. Bridge programs can provide contextualized math, English and science content that many students find more accessible and relevant. They can also provide resume writing, interview and work experiences that help students overcome various deficiencies to prepare for the workforce. We could develop more Bridge to ICT programs.
- **Improve ICT Technology Access Opportunities**
  - There are huge differences in student and workplace success based on access to ICT technologies and services. Those with access are advantaged. Those without access are disadvantaged. We can work to reduce that “Digital Divide.”
- **Increase Number of Industry Academies and Industry Certification Based Courses**
  - There are many ICT vendor and vendor-neutral driven efforts to improve ICT education and workforce development. They include: Cisco Networking Academies, Oracle Academies, Microsoft IT Academies, CompTIA and a large portfolio of associated certifications. Certifications are known and have value beyond the local community. Resources from these programs are significant. Adoption of standard curriculum makes articulation, transfer and cooperation easier. We could work to create more industry academies and courses tied to standard industry certifications.
- **Create Innovative Technical Lab Solutions**
  - ICT equipment and support are expensive and complex. Technical labs are often required for hands-on student experiences. Currently, each program is typically expected to create and manage its own labs. We could more efficiently offer remote access computer lab facilities for use by multiple stakeholders in San Francisco, to increase lab access availability.
- **Use Technology to Deliver Courses into High Schools**



- Often, lack of teacher or lab resources is a reason ICT classes are not offered in high schools. It is technically possible for a community college teacher to deliver classroom instruction to high school students remotely, both synchronously and asynchronously. That helps recruit and serve high school students in ICT Pathways.
- **Create Internship, Field Trip, Job Shadowing & Other Experiential Learning Opportunities**
  - Employers definitively repeat that ICT technical skills are not enough for ICT workforce success. Soft, workplace and employability skills are at least as important. Showing up on time, seeking needed information, managing time and work, understanding cultural and business contexts, good communication skills, problem solving abilities, reasonable expectations and taking charge of continued growth are among the many requirements for workplace success. We can help students develop those skills with real world or real world like experiences to improve their workplace readiness. Field trips to ICT employer sites, shadowing ICT workers in the workplace, mentoring programs for students and faculty, internships, service learning projects, employer guest lectures, internships, scenario- and problem-based learning opportunities are all things we could create, expand and improve to improve ICT Pathways in San Francisco.
- **ICT Job Counseling, Listing and Placement Services**
  - We can work on better advising students and helping them get ICT workforce jobs, through a variety of ways.
- **Improve ICT Resources for Counselors and Advisors**
  - Many high school and college counselors do not understand the ICT space very well, and they therefore have difficulty advising students on ICT related education and career opportunities. We could create tools to help them.
- **Improve Public Awareness of ICT Opportunities**
  - There is a general lack of knowledge by San Francisco stakeholders of the many good resources, programs and opportunities around ICT in San Francisco. At the very least, we can help share information in better ways, especially helping people understand their options, from wherever they are.
- **Increase K-12 ICT Classes Meeting A-G and Graduation Requirements**
  - We can incent more students to take ICT courses if they meet other requirements.

## Findings and Recommendations

### SFUSD

There are many good things to build ICT Pathways on at SFUSD, with approximately 15 schools offering ICT related classes, numerous CBO relationships and passionate teachers. There are also a number of challenges, which are also opportunities to improve ICT Pathways.

There are wide disparities between SFUSD schools. As indicated in the detailed reports on each school, lab facilities and software capabilities range from abundant to minimal, course offerings range from none to many, and teacher backgrounds are very different.

It's important to note that SFUSD ICT related courses are electives and their content is generally not included in standardized testing. Although it's more of an issue of budget than testing, it's often up to the schools if they offer such course or not. For this reason, there is no district ICT department, and therefore no curriculum development or teacher support. Many of the faculty that teach ICT course are not ICT educators, but teachers of other subjects that happen to teach ICT. They have little or no ICT related faculty development, so they have to figure it all out on their own. And similar to postsecondary ICT education, there is a need for more consistency in the curriculum.

Encouragement for students to pursue ICT pathways usually comes from teachers. Providing teachers opportunities to get together to talk about curriculum content and the pathways would broaden possibilities and improve consistency in content. SFUSD counselors are over-burdened and lack awareness. Promotional materials and counselor toolkits would make a real difference.

SFUSD needs resources to support technical labs and access. SFUSD would also benefit from increased ICT employer engagement, to help create a variety of internships and other experiential learning opportunities for students and faculty.

A brief glimpse at middle school students identifies the need for a summer bridge or Introduction to ICT class that can be offered between 8<sup>th</sup> and 9<sup>th</sup> grade and perhaps again between 11<sup>th</sup> and 12<sup>th</sup> grade. This bridge program can be

- An introduction to IT/ICT careers, schools and city programs
- Continuing ICT User knowledge and skill development
- Exposure to cool technologies
- An Introduction to CCSF Dual Enrollment and ICT related departments
- Inspiration to pursue ICT Pathways

A positive finding is that digital literacy is considered part of P21 and is included in curriculum when teaching students how to prepare and present projects.

Teacher professional development is needed if we want teachers to teach current ICT technologies and prepare students for current ICT workplace roles. That includes technical education, pedagogical practices, mentoring and externships for teachers.

As SFUSD moves forward with the Beyond the Talk 2.0 strategic plan, more opportunities will arise for additional improvements.

## CCSF

What stands out in the summary of information about CCSF ICT programs is the data that presents the high number of students participating in contrast with those that actually complete certificates, degrees and transfers. This is not necessarily a negative assessment of program effectiveness. In fact, it may be the opposite, if student goals are considered.

Many students who do not complete CCSF programs are there only to take the courses they need to learn skills necessary to get jobs or advance in their careers. Many already have degrees and/or

are employed. Community college program success is increasingly measured by accomplishment of transfer, degree or certificate completion. Those are not even goals of many ICT students. It would be tragic to cancel or reduce ICT course options that lead very directly to workplace success, because students who benefit from them are not interested in transfer, degrees or certificates that are being universally applied as success metrics for community college programs.

California Community Colleges are all facing severe budget cuts. The programs outlined above risk discontinuation due to the data that reflects lack of completion. Additionally, programs are impacted. Community colleges are turning away students. There is little encouragement for program development and innovation in periods of cuts and constraints.

Within CCSF, there is inconsistent coordination and communication between the five ICT related departments. Each is more or less its own silo. Better coordination and communication between them should lead to better student outcomes. Additionally, there are opportunities to improve strategic stakeholder engagement by presenting ICT at CCSF as one thing, delivered through 5 departments. The combined student, program and lab stories are much more compelling than mixed messages and smaller numbers from different individual departments. One way to increase the probability that ICT programs survive is to present ICT as one strategic common front shared by the five departments that deliver the skills necessary to meet the workforce demands. Doing so will also better engage key partners such as the sf.citi industry association.

There is also a lack of awareness in the broader community, businesses, and industry of CCSF's programs, certificates and degrees that have proven to be effective in preparing the ICT workforce. Because enrollment at CCSF is so high and classes are full, ICT promotion has not been a priority.

This lack of awareness also extends to CCSF resources and achievements that enhance the college's pedigree as a strategic partner to the broader community. For example, MPICT and CCC ICT Collaborative efforts provide faculty development opportunities to help ICT faculty stay current in the latest technologies and teaching practices. Three departments at City College – CNIT, CS and Graphic Communications – are participating in the TechSF Initiative, funded by a grant from the US Department of Labor (DOL) to San Francisco to train and reskill San Francisco residents for the City's growing number of technology and IT jobs.

The NSF-funded Bio-Link ATE National Center is also hosted by CCSF and was created to improve and expand educational programs that prepare skilled technicians to work in the biotechnology fields, another industry driving the U.S. economy. CCSF is home of the Bay Area Region CCC Center of Excellence. The CCC's Economic and Workforce Development's Centers of Excellence support business and industry through its nationally recognized [industry reports](#). The CCC COE at CCSF has collaborated with MPICT to develop ground-breaking reports including a [Phase 1 2009 ICT Environmental Scan](#), a [Phase 2 2010 ICT Industry and Employment Outlook](#), a [Phase 3 2011 Educational Program Input](#), and [2011 Emerging Trends in Mobile Media](#). Members of the broader community ([TECHSF](#), [The Stride Center](#), [Career Ladders Project](#) and [CETF](#)) have used these reports to make their cases for ICT workforce development.

If programs at CCSF can lead to good paying jobs, then why are the ICT pathways still lacking the student participation so essential to meeting workforce demand? Based on what has been learned from this study, there are some immediate actions that can be taken. For example, the [SF Bridge to Success](#) program found that new high school graduates were having difficulty competing with other applicant groups (continuing, transfer, and returning students) for entrance

to the college. The program was recently successful in changing policy to give new high school graduates enrollment priority. The SF ICT Pathways Project intends to identify and pursue additional “low-hanging fruit” opportunities like this to increase participation in all programs like Bridge to Success, TECHSF, and CCSF/SFUSD dual enrollment. Some ideas for increasing participation:

- Raise awareness of what pathways are and where they exist with different stakeholder groups via informational campaigns.
  - Promote the pathway concept through a graphical representation of the ICT pathway.
  - Promote Dual Enrollment High School website ([www.ccsf.edu/hs](http://www.ccsf.edu/hs)).
  - Increase visibility of ICT programs at CCSF by presenting ICT as one strategic common front shared by the five departments that deliver the skills necessary to meet the workforce demands.
- Create collateral and promote ICT educational and career opportunities to each high school, CCSF department, CBO program and other broader community programs and efforts.
  - Teach CCSF student ambassadors about CCSF ICT programs and pay them to go to high schools and CBOs to promote these programs to youth.
- Build relationships among High School and City College faculty, counselors and administrators.
- Participate in ninth-grade Plan Ahead SFUSD Career Exploration class and High School Career Days.
- Focus on aligning student learning outcomes in existing HS and CC curriculum
  - Discuss articulation agreements and other alignment opportunities
  - Increase enrollment in dual/concurrent enrollment course and courses offered for participation
- Develop a toolkit for counselors to advise on ICT opportunities

The project also has had preliminary discussions about forming a committee that represents existing pathway programs that can work together to find more ways to get more students successfully engaged and taking advantage of these resources. Faculty are also being encouraged to innovate and incorporate the breadth of skills employers are seeking by incorporating problem-based learning as well as techniques that support and retain students from under-represented groups. The project has also learned that the CCSF Career Development Center doesn't have the time to directly serve the ICT departments. When a Pathways Committee is formed, the entire system of support must be represented, including a discussion of internships and job placement.

### **CBOs**

There a distinction between CBOs focused on technology training and those providing access to ICT technologies. For example, San Francisco libraries have computer and internet access, and librarians are available for support in their use, but few libraries provide technical classes. CBO participants have limited knowledge of other CBO programs and how they fit together.

Every CBO researched had computer access for youth. We attribute this to Silicon Valley corporate computer and software donations to nonprofits in the Bay Area for the last 10-12 years.



Most websites mentioned having computers and other technology access, but descriptions were very general and most gave no detail about the training content. When we were able to talk with a staff person, we found that by and large, they provide access but not training. Some staff mentioned that given the amount of training done in the schools, additional training is not necessary. In fact, most students knew more than the staff.

Employment training programs tend to be more focused on job training than technology training. For example, many community-based programs provide training that focuses on resume writing, interviewing, and writing skills. The resume writing component provides youth access to computers, and staff considers them to be receiving "training". These services could support various ICT pathway programs.

Technology-based CBOs like BAVC, KQED and BAYCAT are aware how their programs fit into an ICT education and career pathway. Other community-based agencies only knew their programs might lead to a better job.

Many community groups and agencies apply for and receive technology grants that are primarily for software and hardware. We found very few training programs funded by private technology companies. For example Adobe Voices is a project where the software company, Adobe, provides software to teachers that they can share with their students and encourage use through incentives and competitions. Community based organizations that receive such funding are driven by the expectations of the funder. The opportunity exists to work with funders to encourage collaboration and partnerships to improve participation in pathways that lead to careers. An example of such a successful effort is the work that the Irving Foundation is doing with four of its grantees – BAVC, BAYCAT, Youth Uprising and Youth Radio.

Probably the most impactful and symbiotic contribution that CBOs can make to the goals of this project is bridging the digital divide that often inhibits the entry to ICT career pathways by under-represented youth. In communities such as Southeast San Francisco, the divide is more than the lack of access to the technologies; it is also the lack of ICT courses at the schools they attend. Black, Latino, and many other special population students in predominately low-income communities such as Bayview Hunters Point, get stuck at a major gate on the pathway. CBO collaborations with SFUSD, CCSF and agencies such as OEWD can enable an entry point that works for non-traditional and under-represented students.

To achieve the goal of identifying pathways to education and careers at the entry levels provided by CBOs and other public agencies, it is necessary to visit many of the sites and talk directly with program directors and managers.

### Broader Community

The Broader Community includes the City and County of San Francisco, businesses and industry organizations. San Francisco has a strategic interest in ICT pathway creation as an element of

attracting technology businesses to San Francisco. One of the reasons high-tech stars like Twitter, Zynga, Yelp and Salesforce.com have headquartered in the City is the people they want to hire live here. As a result, there is an increased focus on job training and workforce development initiatives and programs. Our findings confirmed San Francisco's commitment.

- TechSF is funded by the Office of Economic and Workforce Development (OEWD). Aligning the workforce with strategic industries and supporting emerging technologies industries and infrastructure are two of OWED's strategic foundations.
- The City and County of San Francisco also supports the SF Bridge to Success program.
- San Francisco Citizens Initiative for Technology and Innovation (sf.citi), an industry organization created to leverage the power of the technology community around civic action in San Francisco, has projects in development that focus on job creation, training, placement, and education innovation.

Programs such as TechSF and Bridges to Success partner with SFUSD, CCSF, and CBOs to create pathways, support student success, and build on the region's technology and talent. Industry organizations such as sf.citi are a voice in the promotion of tech sector interests and growth. sf.citi's SummerQAamp and the Mayor's Summer Jobs+ Challenge programs provide youth from underserved communities with ICT pathway opportunities and the support of mentors and internships supplied by sf.citi member organizations.

These initiatives create the relationships between education, the community, and business that, by working together, can be far more effective. For example, the three CCSF departments working with TechSF and Bridges to Success had very little contact and awareness of the common work being done until the SF ICT Pathways Project began the research for this report. As result, they have begun to share information with a pledge to collaborate. As mentioned above for the CBOs, more opportunities can be created when organizations with similar missions and priorities meet in dialog around how we can complement and coordinate our efforts.

## Summary of Recommendations

These recommendations are preliminary, given that this inventory is not conclusive and stakeholders input is forthcoming. We offer them as ideas to continue toward the project's goal to build and implement a model pathway framework that attracts more students to ICT and supports their retention and completion. The next step toward that vision is to promote existing opportunities while identifying and improving elements that may be missing and building collaborative relationships between stakeholders as an important strategy to sustain the work.

### Awareness

Across all three segments of this study (SFUSD, CCSF and CBO/Broader Community), the common thread was a lack of awareness of ICT Pathways opportunities, programs, and support. The overarching recommendation here is to design and implement an ICT Pathways awareness campaign that reaches out to all audiences and stakeholders. Some examples of related project are:

1. Develop a graphical representation of the ICT pathway to be used in all materials and media
2. Develop promotional materials (brochures, videos, posters) for

- a. High school and college teachers to share with students and parents
- b. High school and college counselors
- c. Community-based organizations
- d. Public workforce systems and their programs
- e. An “ICT at CCSF” brochure that increases visibility of ICT programs at CCSF by presenting ICT as one strategic common front shared by the five departments
3. Create a “one stop” website that provides a comprehensive overview and details about specific programs at each institution, and how to participate
4. Conduct events similar to the Bridge to Success “Frisco Day” that focus on ICT pathways
5. Look for opportunities to conduct similar events with Broader Community partners
6. Create ICT career/education exploration videos and disseminate
7. Promote ICT Dual Enrollment courses ([www.ccsf.edu/hs](http://www.ccsf.edu/hs))
8. Teach CCSF student ambassadors about our ICT programs and pay them to go to high schools and CBOs to promote these programs to youth.
9. Create awareness and provide outreach materials for staff of technology-access locations such as libraries and community based computer labs.

### **Curriculum Alignment**

Dual/concurrent enrollment has proven to be one of the most effective approaches to attracting and retaining student on the ICT pathway. Here are the related ideas for leveraging this success:

1. Market and increase enrollments in dual/concurrent enrollment courses
2. Align existing high school and community college curriculum
  - a. Increase numbers and kinds of articulation agreements
  - b. Increase Dual/concurrent enrollment course agreements

### **Curriculum and Faculty Development**

SFUSD has no ICT department to promote and support the development, consistency and update of related curricula.

1. Increase the number of high school Cisco Academies
2. Create more traditional Computer Science or engineering classes in high school
3. Assess and develop a plan to address inconsistencies in high school ICT courses
4. Create more ICT high school classes that incorporate IT and business applications
5. Promote and recruit for faculty externships
6. Identify and introduce new problem-based curriculum such as Algebra II for the 21<sup>st</sup> Century.
7. Get the California Department of Education ICT CTE standards promoted and adopted at SFUSD

### **Internships and Summer Jobs in ICT**

Exposure to relevant and meaningful work experience such as that provided by bridge programs gives participating students a vision for what’s at the end of the pathway. More opportunities for internships and summer jobs are essential.

1. Increase the number of summer camps/job programs by
  - a. Recruiting into existing summer programs

- b. Creating new summer programs that meet unmet needs
2. Expand existing SFUSD and CCSF internships, workplace shadowing and other experiential learning opportunities

### **Collaboration and Relationship-Building**

To achieve all of the recommendations listed above will require collaboration between the schools, the community and businesses. Most of it cannot be done without it. The Broader Community organizations have demonstrated that partnership is how things get done – OEWD programs such as Bridge to Success and TechSF are examples. Here are some ideas:

1. Establish joint projects with TechSF and sf.citi
2. Create opportunities for SFUSD and CCSF faculty, counselors, and administrators to network and share ideas
3. Establish a collaborative of departments and programs with similar objectives to exchange ideas and leverage resources and outreach

### **Conclusion**

There is a “perfect storm” brewing in San Francisco for ICT, ICT employers, ICT workforce, ICT educators and various community-based organization efforts focused on ICT. San Francisco is successfully attracting “high-tech” employers, and those employers need a competent ICT workforce. ICT workforce roles support high quality lifestyles. Those organizations and jobs improve the San Francisco economy. There are a wide variety of educational and public workforce systems, community-based organizations, and grant funded initiative efforts in San Francisco to provide access to ICT, ICT education and ICT workforce development services.

This initial draft document provides information on what we have to work with to improve ICT Pathways in San Francisco. Hopefully, additional good reference information will be added to this document over time, and it will serve as a resource for a variety of stakeholders.

Finally, we hope San Francisco stakeholders will come together and work together to make ICT pathways in San Francisco better, in a wide variety of ways.



## Appendix 1: California ICT Sector Profile<sup>3</sup>



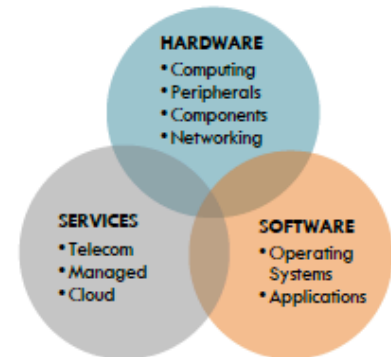
### Doing What Matters for Jobs & the Economy

#### SECTOR PROFILE INFORMATION & COMMUNICATIONS TECHNOLOGIES (ICT)

##### WHAT IS THE ICT SECTOR?

ICT is an umbrella term, used widely outside the U.S. and by the United Nations, to encompass all rapidly emerging, evolving and converging computer, software, networking, telecommunications, Internet, programming and information systems technologies. The sector represents a mix of three industry clusters:

- **Hardware** – firms that create, manufacture and distribute computer, peripheral, networking and related equipment.
- **Software** – firms that create, manufacture and distribute computer operating systems and applications.
- **Services** – firms that bundle hardware, software and other services to deliver solutions to business and consumer customers.



##### EMPLOYER SAYS

*"In the 21<sup>st</sup> century, we live in knowledge and information economies where Information and Communications Technologies are essential strategic elements for success. We need to support educator efforts to develop competent technicians to implement and maintain key ICT infrastructure and support systems."*

— Tom Burns, President  
Enterprise Solutions Division, Alcatel-Lucent

##### WHY ICT?

Over the last generation or so, Information and Communication Technologies (ICT) have spawned a paradigm shift in modern economies and societies. These technologies have permeated every industry and most organizations, changing ways companies operate and interact with customers and suppliers, how human beings organize and manage their lives, how people communicate, and how most workers do their work. ICT is transformational, and ICT companies in California include many global leaders in this dynamic and quickly evolving space. ICT is strategically important to individual citizens, to governments, to all industries, to most organizations, to all students, and for economic development, at every level.

##### quick facts about ICT industries

- ✓ There are about 46,000 ICT Industry related businesses (1 in 28 companies) in California.
- ✓ They produce about \$172 billion in revenue (6% of total California private sector revenues).
- ✓ They employ more than a million California workers (1 in 17 private sector jobs)
- ✓ They pay about \$76 billion in wages (12% of private sector wages, the 2nd highest wage sector) in California.
- ✓ They expect job growth approaching 20% for ICT industries from 2006 to 2016, outpacing the nation.

##### WHAT IS DRIVING GROWTH?

The growth of the ICT industry sector in California can mainly be attributed to:

- Increasing adoption of Information and Communication Technologies (ICT) hardware, software and services by consumers and businesses globally.
- The ongoing replacement of ICT hardware, software and services with new and improved solutions.

<sup>3</sup> [http://www.coeccc.org/documents/dwm\\_ict\\_sector\\_CA\\_12.pdf](http://www.coeccc.org/documents/dwm_ict_sector_CA_12.pdf)

### WHAT ARE ICT INDUSTRY JOBS?

ICT industries employ people in all standard business functions, such as accounting, finance, human resources and administration. What is unique to ICT industry jobs are those devoted to developing and distributing ICT goods and services:

- Hardware and software development roles, including electrical and hardware engineers, computer scientists, software engineers and programmers.
- Roles related to the development and delivery of ICT technical services.
- Roles supporting marketing and sales of ICT related products and services.

### WHAT ICT INDUSTRIES ARE PROJECTED TO GROW?

ICT industries expected to continue to grow rapidly in California include: ICT equipment manufacturers, software publishers, web search services, Internet companies, technical consulting services, computer programming services, computer system design services, and cellular and other wireless carriers.

ICT Industry firms expect 8.5% employment growth and non-ICT industry companies expect -0.4% employment growth over the next 2 years.  
—2010 COE California Employer Survey

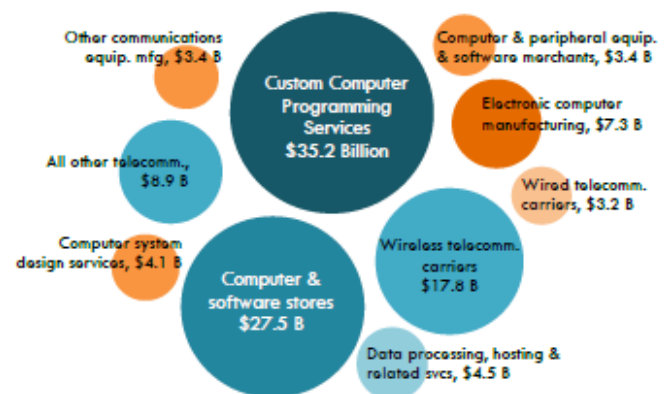
### PROJECTED GROWTH IN ICT INDUSTRIES, 2011-2014

ICT Industry	2010 Jobs	2014 Jobs	Growth/ New Jobs	% Growth
Web search portals	26,044	36,297	10,253	39%
Electronic auctions	6,848	8,636	1,788	26%
Digital printing	4,119	5,145	1,026	25%
Custom computer programming services	173,156	203,724	30,559	18%
Computer systems design services	110,324	130,133	19,809	18%
Cellular and other wireless carriers	26,449	30,503	4,054	15%
Internet publishing and broadcasting	12,915	14,834	1,919	15%
Data processing and related services	25,090	28,669	3,579	14%
Software publishers	53,326	60,227	6,901	13%
Electronic shopping	22,850	25,868	3,018	13%
Broadcast and wireless communications equipment	16,970	18,520	1,550	9%
<b>TOTAL</b>	<b>478,091</b>	<b>562,556</b>	<b>84,456</b>	<b>19%</b>

### WHAT INDUSTRIES ARE DRIVING ECONOMIC ACTIVITY?

ICT industries are strategically important to California for the revenue and wealth they produce, for their high levels of employment and compensation, and for the exports and tax revenue they generate for the state. The two leading industries by sales revenue are Custom Computer Programming Services (\$35.2 billion) and Computer and Software Stores (\$27.5 billion). However, ICT industries are even more important than that strategically, because information and communication technologies are driving efficiencies, increases in productivity, commerce and competitive advantages for organizations in every industry. ICT is a major engine driving 21<sup>st</sup> century information, knowledge and innovation economies in all industry sectors across the state.

### 2010 REVENUE BY ICT SUBSECTOR



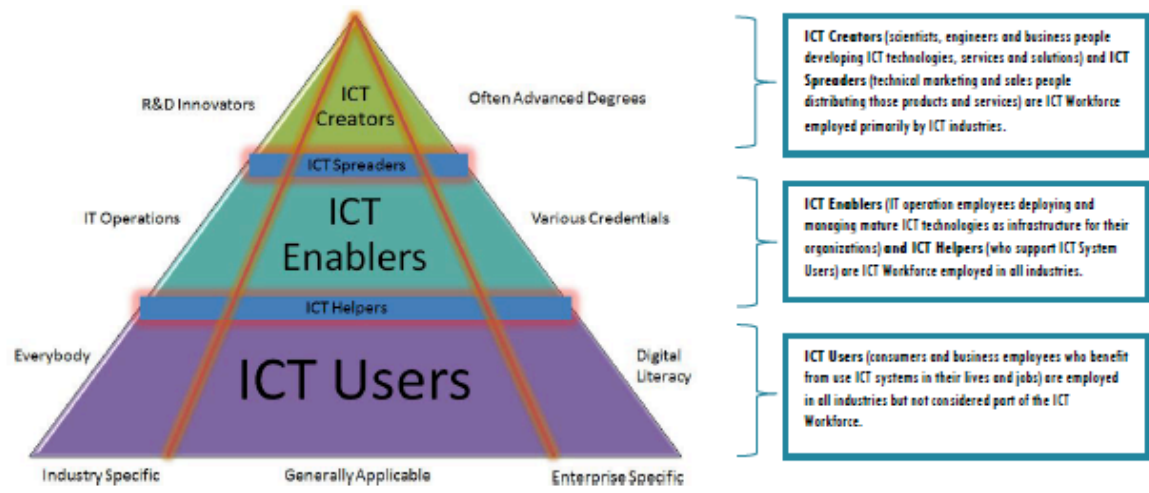
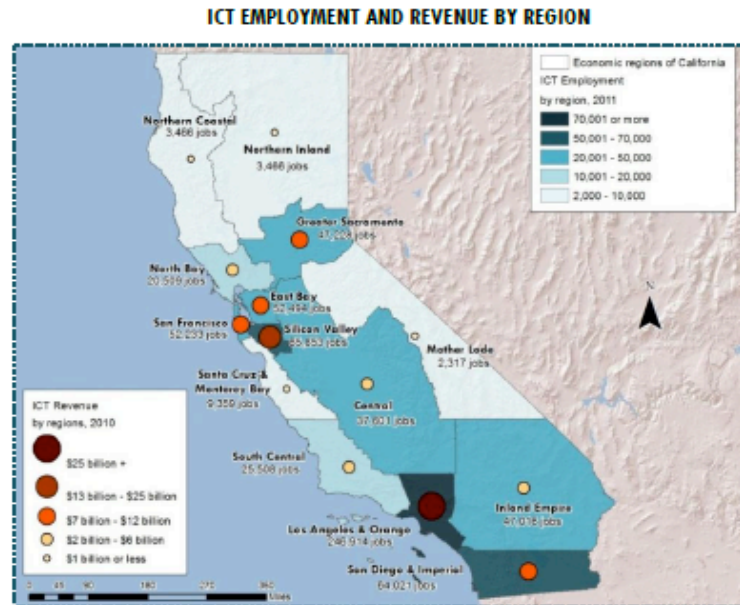
**WHERE ARE THE "HOT SPOTS"?**

ICT employment is most concentrated in the Los Angeles/Orange region and the Silicon Valley. The Los Angeles/Orange region has the highest sales revenue for ICT firms (over \$73 billion), followed by the greater San Francisco Bay Area (\$46.7 billion) – with a large concentration in the Silicon Valley (\$22 billion).

**WHAT IS THE ICT EMPLOYMENT SECTOR?**

Importantly, ICT Workforce employment is not limited to ICT Industries. Information and Communication Technologies are adopted and applied by most organizations, in every industry. Most organizations, in every industry, employ people in ICT Workforce roles to implement, manage and maintain internal ICT systems.

This is an important distinction. The ICT Workforce is pervasive, across all industries, and in many industries the largest areas of employment growth are within their ICT Workforce. ICT Workforce deploys, manages and maintains strategic ICT infrastructure used for competitive advantages, commerce, growth, productivity, and efficiency by most workers in most workforce roles in all industries in California. Additionally, today and increasingly in the future, some level of ICT knowledge and skills is required by most workers, in most workforce roles, even outside the ICT workforce.

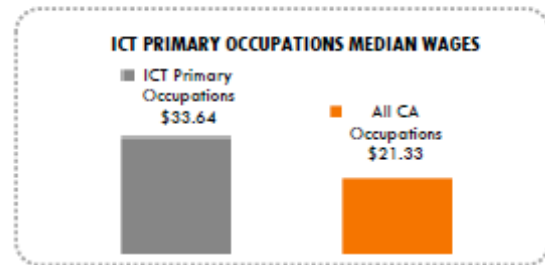


Non-ICT industry companies that forecast - 0.4% overall employment growth expect 3.7% growth in ICT workforce employment over the next two years.  
 -2010 COE California Employer Survey

About 1.2 million people are currently employed in the California ICT Workforce, across all industries. That is roughly 1 in 20 California private sector jobs. California will create 30,000 new ICT Workforce jobs and more than 80,000 ICT Workforce job openings due to replacements, for a total of more than 110,000 new and replacement jobs between 2011 and 2013, according to EMSI data.

### HOW MUCH DOES IT PAY?

In California, the median ICT Workforce hourly wage is about 60% higher than the median wage for all jobs. Information is the second highest paying industry sector in California, after utilities. With annual earnings per worker of about \$110,000, the information industry sector pays 90% higher wages than the average across all other industries in the state.



### WHAT ICT JOBS ARE IN DEMAND?

In practice, employers do not generally use consistent ICT Workforce job titles and descriptions. A recent real-time Labor Market Information study of one California market showed that of more than 2,300 de-duplicate job postings, there were more than 1,900 unique job titles, and even when job titles were the same, job descriptions and requirements were typically substantially different. However, following are some standard ICT Workforce occupations with strong job opportunities.

#### TOP JOB OPPORTUNITIES IN ICT

Description	2011 Jobs	2014 Jobs	New Jobs	% Growth	Replacement Jobs	Openings (new & repl.)	2011 Median Wages	Minimum Education Level
Network Systems and Data Communications Analysts	52,055	57,900	5,845	11%	2,808	8,653	\$32.39	Bachelor's degree
Computer Systems Analysts	69,975	73,200	3,225	5%	4,547	7,772	\$38.41	Bachelor's degree
Network & Computer Systems Administrators	38,887	40,996	2,109	5%	1,950	4,059	\$37.66	Bachelor's degree
Computer Specialists, All Other	34,068	35,144	1,076	3%	2,208	3,284	\$38.45	Associate's degree
Computer Hardware Engineers	17,884	17,582	(302)	(2%)	1,966	1,664	\$52.50	Bachelor's degree
Database Administrators	14,195	14,978	783	6%	715	1,498	\$38.81	Bachelor's degree
Telecomm. Line Installers & Repairers	19,056	19,615	559	3%	1,020	1,579	\$24.32	Long-term on-the-job training
Telecommunications Equipment Installers & Repairers	23,398	22,782	(616)	-3%	2,222	1,606	\$28.20	Postsecondary vocational award
Switchboard Operators, Including Answering Service	17,794	16,939	(855)	-5%	1,965	1,110	\$12.93	Short-term on-the-job training

There were 68,000 online job postings in California for ICT occupations in the last four months. Job postings reflected the need for workers in a wide range of skill and education levels. Although many jobs advertised require baccalaureate degrees or higher, occupations that require community college credentials were also in the mix. Select occupations with vacancies posted include the following:

- Computer Systems Analysts (29,731 job postings)
- Network and Computer Systems Administrators (18,541)
- Database Administrators (8,023)
- Computer Hardware Engineers (5,194 postings)
- Network Systems & Data Comm. Analysts (3,566)
- Telecomm. Equipment Installers & Repairers (1,700)

#### EMPLOYERS WITH THE MOST JOB POSTINGS, FEB-MAY 2012

KFORCE	2,552
CYBERCODERS	2,421
TEK SYSTEMS	1,150
IBM	1,051
DELOITTE	890
RANDSTAD TECH.	758
APPLE	620

#### DATA NOTES AND SOURCES

Data and information included in the Sector Profile were compiled from the following public and proprietary sources: U.S. Bureau of Labor Statistics; CA Employment Development Department; Economic Modeling Specialists, Inc.; InfoGroup, Inc.; The Conference Board - Help Wanted Online; Center of Excellence/MPICT ICT Workforce Studies Phase 2 & Phase 3, [www.coecc.net/ict](http://www.coecc.net/ict); Mid-Pacific Information and Communications Technologies (MPICT) Center, [www.mpict.org](http://www.mpict.org)

## Appendix 2: SFUSD Fact Sheets

### Academy of Arts & Sciences High School

#### **Summary:**

The Academy of Arts and Sciences offers a rigorous and relevant curriculum to meet the needs of our diverse student body. The main emphasis is on a creative science/math block that incorporates collaborative projects, interconnections between the subject areas, and the integration of artistic and innovative thinking with traditional subject matter.

Academy students enjoy an arts-based curriculum and at times are placed in classes taught by SOTA teachers. Academy students have the benefit of the Wellness Center on campus, and receive college counseling through a college counseling club, as well as individual college counseling their senior year. Academy students are offered arts instruction in the following disciplines: classical guitar, taiko drumming, Gamelan Jegog, visual arts and vocal music.

#### **ICT Courses:**

None

#### **ICT Course Student Enrollment:**

None

#### **ICT Course Demographics:**

See Appendix #1A

#### **ICT Course Descriptions:**

See Appendix #1C

#### **Internship:**

n/a

#### **Internship Demographic:**

n/a

#### **Dual Enrollment Courses**

See current CCSF Catalog

#### **Dual Enrollment Fall 2012:**

None

#### **Relationships with advisory groups:**

None

#### **Lab Facilities:**

2 Computer Lab

**Certification Testing:**

None

**Graduation Certification:**

None

**Strategic Partnership:**

n/a

**Clubs related to ICT:**

None

**School Enrollment**

2011 – 334

2010 – 360

2009 – 396

**School Demographics:**

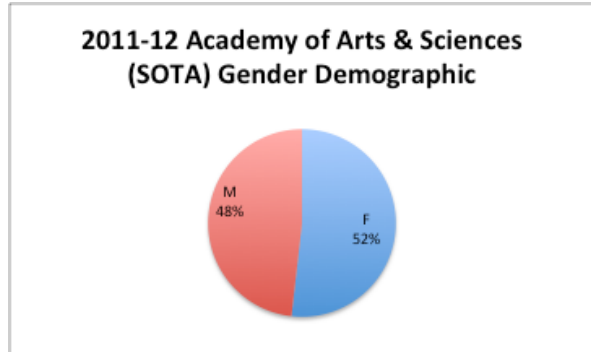
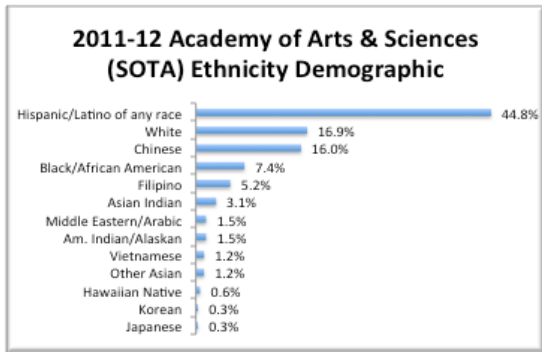
See Appendix #1A

**Graduation data:**

n/a

**School Demographics**

334 Students



## **Ruth Asawa School of the Arts (SOTA) High School**

### **Summary:**

The Ruth Asawa San Francisco School of the Arts (SOTA) provides students with a rigorous and inspiring high school program in both artistic and academic disciplines. The learning environment at SOTA is conducive to creative and independent thinking as well as excellence throughout the curriculum. SOTA has an aggressive outreach program to ensure that all San Francisco students have a chance to participate in our educational opportunities. Along with our staff of highly qualified credentialed teachers, SOTA students work alongside artists from the community who specialize in specific areas within their chosen artistic discipline. Students enter School of the Arts through an audition and portfolio process.

### **ICT Courses:**

- Media Arts 1-4

### **ICT Course Student Enrollment:**

- 39 students

**Internship:** n/a

### **Dual Enrollment Courses**

- See current CCSF Catalog

**Dual Enrollment Fall 2012:** n/a

### **Relationships with advisory groups:**

- SOTA Advisory Board

### **Lab Facilities:**

2 Media Production Labs

**Certification Testing:** None

**Strategic Partnerships:** n/a

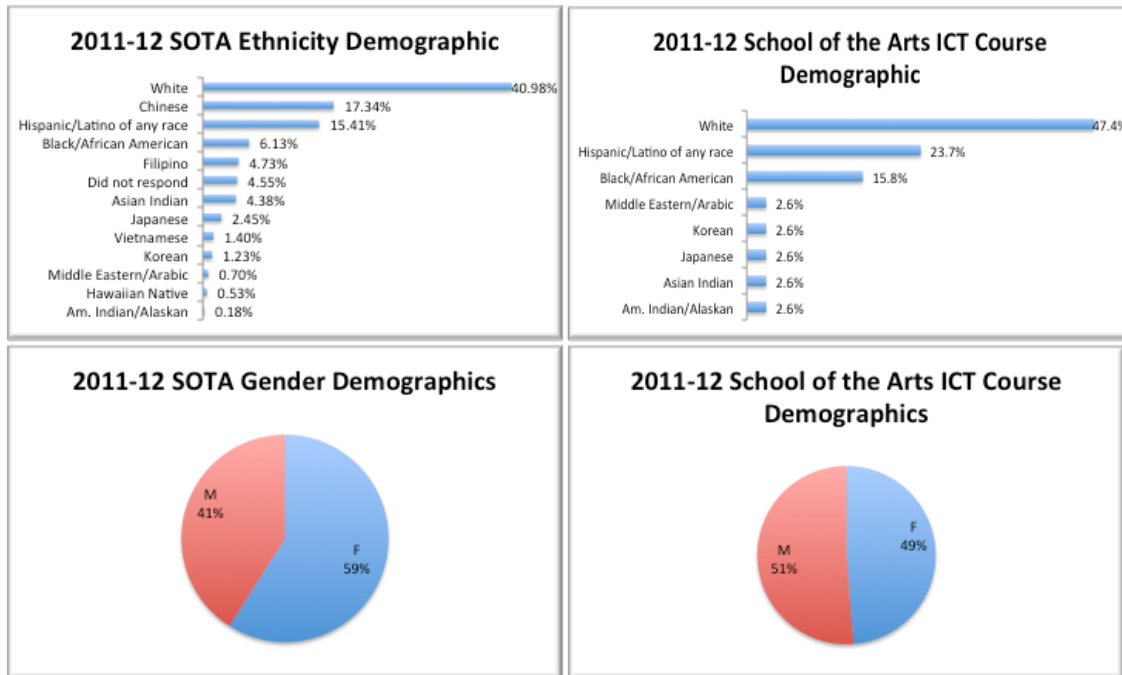
### **Clubs related to ICT:**

- Robotics

### **School Enrollment**

- 2011 – 571
- 2010 – 679
- 2009 – 534

## Demographics:



## School of the Arts High School Course Descriptions:

### Media Arts 1-4

- **Course: MEDIA ARTS 1-4** Description: Students learn communication skills with video and other multimedia technologies. Students will become proficient in camera, audio, and video editing technologies. Students will gain skills in inquiry-based learning, project management, teamwork, client service, and problem solving. Students are also exposed to aesthetic valuing and creative challenges. Students will leave this class with a portfolio of work demonstrating skills that could be applied to areas as broad as print media or architecture  
Grade Level: 10-12  
Pre-Requisites: None  
A-G status: F



## Balboa High School

### Summary:

Balboa is a college preparatory high school instruction is organized through small learning communities so each student is able to build powerful relationships with teachers while engaging in rigorous academic, artistic, and athletic pursuits. At the end of 10th grade, the students select a field of interest that they will pursue as juniors and seniors in one of the School-to-Career pathways. Balboa Pathways include (**Law, Digital Media, Information Technology, International, WALC & PULSE**) Balboa High School had 2,132 students. Galileo provides students with career pathways in biotechnology, environmental science, health, hospitality and tourism, computer science, and creative media technology

### ICT Courses:

- Animations
- AP Computer Science
- Computer Applications
- Media Art
- Web Design
- Dual Enrollment

### ICT Course Student Enrollment:

- Academy of Information Technology, AOIT - 60
- (CAST) Digital Media Pathway- 165

### Internship:

- AOIT: 8
- CAST: 65-80

### Dual Enrollment Courses

- See current CCSF Catalog

### Dual Enrollment Fall 2012:

- AOIT – 14 Students
- Digital Media – n/a

### Relationships with advisory groups:

- SFUSD AOIT
- CAST Advisory Board

### Certification Testing:

- Certiport-
- ACA Photoshop
- Premiere
- Flash

**Graduation Certification:** None

### Clubs related to ICT:

- Robotics
- Art
- Computer

**Strategic Partnerships:**

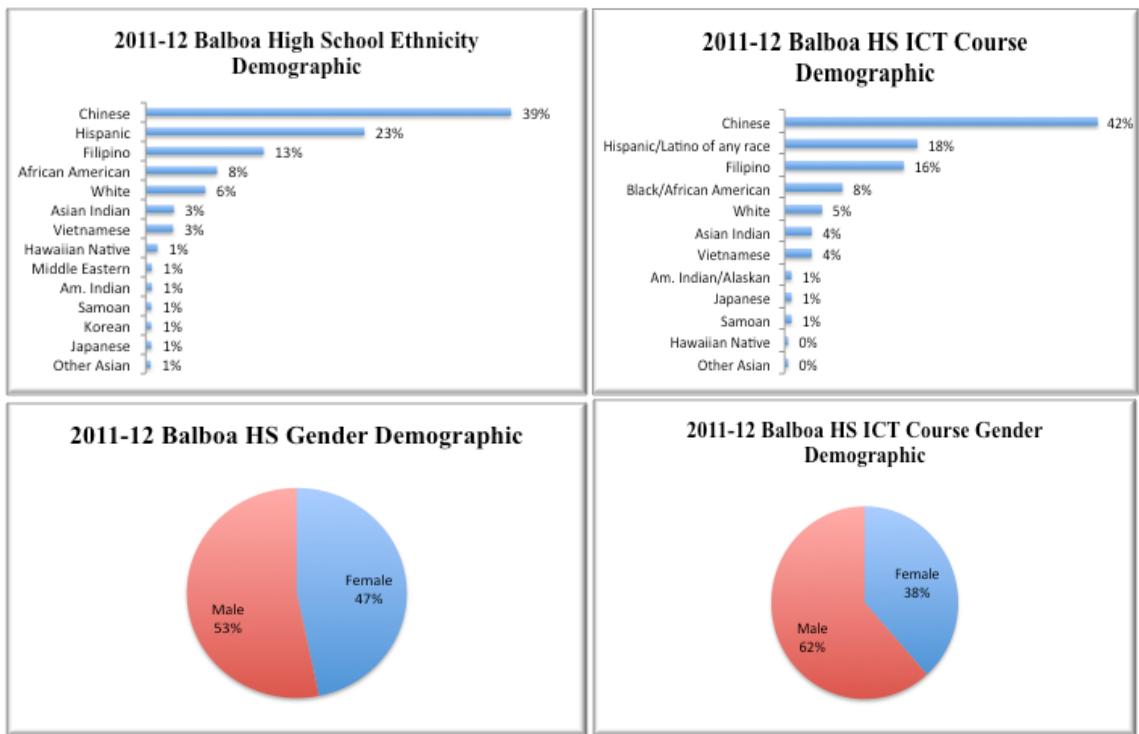
Adobe Youth Voices  
 California Partnership Academy  
 Young California Writers Project  
 Engineers Art Alliance  
 Children’s Creativity Museum  
 Jewish Contemporary Museum  
 BAVC                      NAF  
 SCREAM                 Out of Site  
 SF Mime Troupe        ACT Theatre  
 SF Film Society        Iridescent  
 DeYoung Museum     BAYCAT

**School Enrollment:**

2011 – 1,388  
 2010 – 1,362  
 2009 – 1,298

**Graduation data: n/a**

**School & ICT Course Ethnicity:**



## Balboa High School ICT Related Course Descriptions

### Academy of Information Technology

ROP/CTE Recommended Courses	Grade 10	Grade 11	Grade 12	Post- secondary course, certificate or degree program
	<i>Introductory</i>	<i>Concentration</i>	<i>Capstone</i>	
		<b>Computer App 1 &amp; 2</b>	<b>AP Comp Sci or Dual Enrollment</b>	

#### 11<sup>th</sup> Grade - Computer Application

This course is the first of a two-year sequence covering computers and information technology addressing the following areas:

**Computer Hardware:** Students will understand the components of a computer including how each component contributes to the operation of the computer, and how to debug and upgrade various components in a computer.

**Computer Networking:** Computers are often the entry-way to local resources as well as the vast resources available on the Internet. Students will explain how a computer works within a network environment. Students will also explore how information flows on the Internet through web page design.

**Computer Demands:** Different applications stress different parts of the computer. Students will compare the technological demands of some common kinds of applications and describe how to tailor a computer towards specific tasks, including: multi-media, games, networking, and household productivity.

**Computing Ethics:** Computers have created new challenges in privacy, property, security, and identity. The knowledgeable computer user must confront issues relating to viruses, identity theft, plagiarism, etc. Students will examine the morals and ethics of being a responsible computer user in academic, industrial, and home settings.

#### 12<sup>th</sup> Grade AP Computer Science:

**Course: ADVANCED PLACEMENT COMPUTER SCIENCE A 1/2** Description: Computer Science A emphasizes object-oriented programming methodology with an emphasis on problem solving and algorithm development and is meant to be the equivalent of a first-semester course in computer science. It also includes the study of data structures and abstraction.

Grade Level: 10-12

## CAST Digital Media Pathway

ROP/CTE Recommended Courses	Grade 10	Grade 11	Grade 12	Post- secondary course, certificate or degree program
	<i>Introductory</i>	<i>Concentration</i>	<i>Capstone</i>	
		<b>Animations</b> ½ <b>Media Art</b> ½	<b>Animation</b> ¾ <b>Media Art</b> ¾	

The CAST Academy at Balboa High School is career/technical pathway supported by the State of California Education Department's California Partnerships Academies. CAST is a visual and performing arts based program with an emphasis on the career/technical professions in the areas of the Arts and Entertainment Industries.

Using the arts and design as a lens for examining the world around them, students become keenly aware of the every day impact of visual communications and design on our lives. By engaging in creatively and technically challenging mediums like video, audio, digital animation, motion graphics, and theatre production, students learn the skills and understanding necessary to actively create their own channels of communication. By working both as individuals as well as in production teams, students learn to work together to problem solve and produce a work that is larger than anyone individual.

One of the defining characteristics of the 21<sup>st</sup> Century is the explosion of digital media across the education and professional world. Students in the CAST academy learn the foundations of advanced digital media processes and the technology and software necessary to produce such media.

Students in CAST are required to be involved in a minimum of two outside learning experiences/internships. This component is required, understood and agreed upon when students select CAST. These opportunities range from learning advance methods and procedures in digital media, to internships at local museums, like the de Young, YBCA, and the Asian Art Museum.

The CAST required course work meets all minimum UC A-G requirements, as well as helps to build invaluable academic and professional portfolio development, networks, and experiences.

### **Course: MEDIA ARTS 1-4**

Description: Students learn communication skills with video and other multimedia technologies. Students will become proficient in camera, audio, and video editing technologies. Students will gain skills in inquiry-based learning, project management, teamwork, client service, and problem solving. Students are also exposed to aesthetic valuing and creative challenges. Students will leave this class with a portfolio of work demonstrating skills that could be applied to areas as broad as print media or architecture

Grade Level: 10-12

Pre-Requisites: None

A-G status: F

**Course: ANIMATIONS 1-4** Description: Students learn animation skills in a hands-on studio environment that emphasizes a strong foundation in basic artistic theory and drawing technique. Students then learn to work with a wide range of industry standard software, and digital production techniques and project management skills. Students learn to work with Photoshop, Illustrator, Flash, After Effects, and Premiere. Students learn fundamentals of audio and video editing, and media encoding.

### **Balboa High School Lab Facilities**

#### **CAST Pathway:**

Animation lab (Mac) –

5 eMacs            31 iMacs

Software-

2pencil testing software and hardware stations setup

5 scanning stations

Adobe CS4 Master Collection - 31 newer iMacs

RetasProSuite (Studio Animation Software)

Microsoft Office 2011.

Mobile Lab –

18 laptops –

Software –

Final Cut Pro

Adobe CS4

Video-

10 video cameras

Music Production-

6 iMacs-

Software-

Pro Tools

Reason

6 small digital keyboards connected.

In school broadcast system and small room set up for weekly homeroom broadcast of announcements and media.

## Burton High School

### Summary:

Burton is a college & career preparatory high school instruction is organized through Academies. Burton has four National Academy Foundation Academies in Engineering, Finance, Information Technology and Health Sciences. Burton has a student body of approximately 825 students and is located in the Visitacion Valley neighborhood of San Francisco.

### ICT Courses:

- Accounting
- Bank & Credit
- Computer Art
- Media Art
- Marketing & Entrepreneurship
- Video Production & Editing

### ICT Course Student Enrollment:

- Academy of Information Technology, AOIT - 127
- Academy of Finance - 78

### Internship:

- AOIT: 7
- AOF: 1

**Internship Demographic:** n/a

### Dual Enrollment Courses

- See current CCSF Catalog

### Dual Enrollment Fall 2012:

- 5 students

### Relationships with advisory groups:

- SFUSD AOIT
- SFUSD AOF

### Lab Facilities:

1	Broadcasting Studio	1	Library Lab
2	IT Labs	1	Engineering Lab
1	Counseling Lab	1	College & Career Lab

### Certification Testing:

- NAF
- Certiport - MOUSE

### Clubs related to ICT:

- Robotics

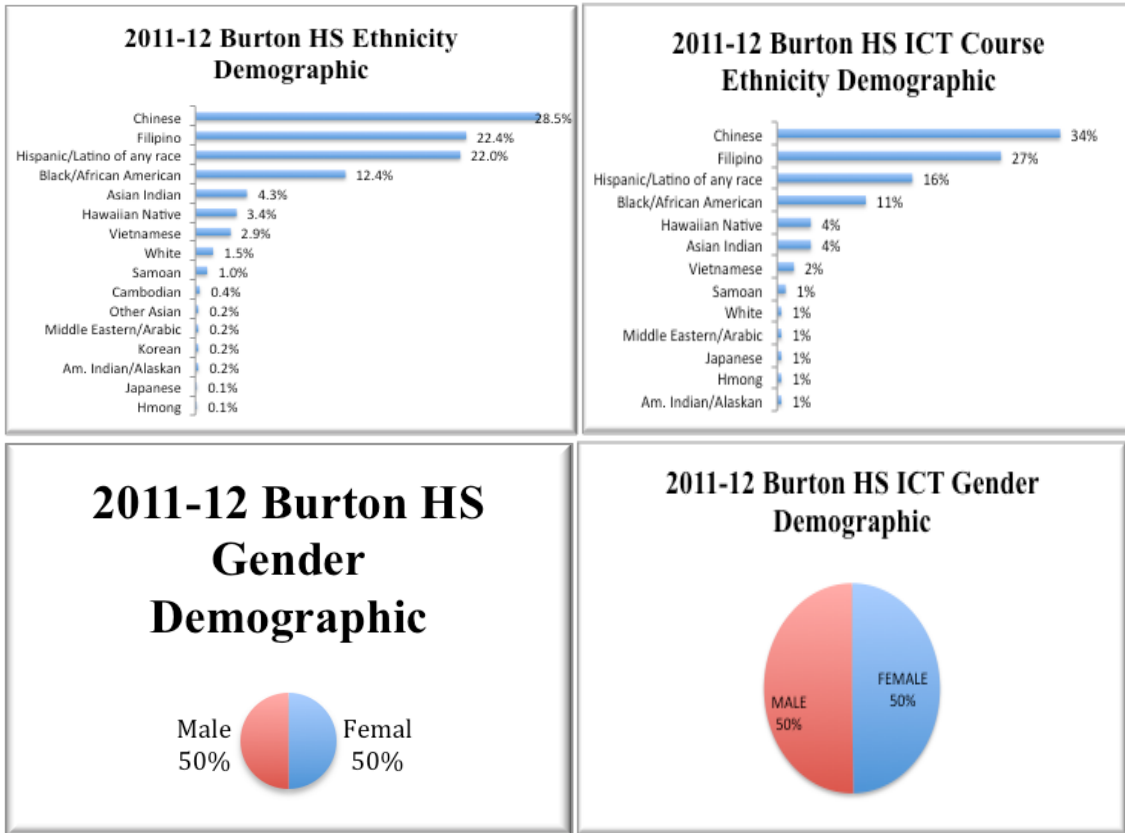
**Strategic Partnerships:**

Adobe Youth	NAF
Voices	SF Ed Fund
BAVC	KALW
BAYCAT	

**School Enrollment**

- 2011 – 833
- 2010 – 749
- 2009 – 820

**Demographics:**



**Burrton High School Course Descriptions**  
Academy of Information Technology

ROP/CTE Recommended Courses	Grade 10	Grade 11	Grade 12	Post-secondary course, certificate or degree program
	<i>Introductory</i>	<i>Concentration</i>	<i>Capstone</i>	
	Media Production	Information Technology & Broadcasting	Broadcasting	

10<sup>th</sup> Grade -- Media & Production – Introductory

- Introduction to Digital Media & Production provides an overview of information technology today. It serves as the foundation for all of the core courses offered by the Academy of Information Technology. This course provides students with an introduction to the common hardware and software that most of our digital media is designed and built with. Students will learn to work with different operating systems, write some basic programming code, organize project folders and manage workspaces, and produce audio and video projects using the latest digital capture devices and software applications. In addition to introducing students to technical skills, the course will develop students’ ability to communicate effectively and work collaboratively. Introducing these “soft skills” to AoIT students is critical as we prepare them for internships and future careers in information technology. During the course, students consider contemporary IT issues such as security and privacy, the effects of IT on society, and technological inequality. Lastly, students get a chance to discover the types of careers that exist in IT today.

11<sup>th</sup> Grade -- Information Technology & Broadcasting – Exploratory

- Information Science / Broadcasting provides a hands-on introduction to digital video. The course guides students through all phases of digital video production, including pre-production and planning, executing and managing a video shoot, and editing and post-production techniques. Students explore methods of sharing and broadcasting digital videos, including multiple platform versions, CDs and DVDs, and web delivery. They also learn about the latest methods of publicizing a digital video, such as using online search engines to direct viewers to the production. Finally, students have a chance to discover the types of careers that exist in digital media and design today.

12<sup>th</sup> Grade -- Broadcasting & Special Projects – Preparation

- Broadcasting Program Seniors in the AOIT program will apply their Academy skills and knowledge to take on social enterprise projects that not only benefit the Burton community but also provide opportunities for students to deepen their understanding of the industry. In collaboration with Adobe Youth Voices, KALW, San Francisco Ed Fund, and BAYCAT, seniors will produce a regular broadcasting program for the school community.



## City Arts & Tech High School

### **Summary:**

City Arts and Technology (CAT) is a tuition-free public charter high school (grades 9-12) dedicated to transforming students' lives by preparing them for success in college and in life. CAT offers students a rigorous academic experience and a diverse, compassionate community in which to grow. Students are inspired and empowered to be leaders in their high school education and their communities.

CAT's total 9-12 population is approximately 400 students. CAT offers college prep classes for all students and an Arts and Technology curriculum centered on Project Based Learning. Class sizes are approximately 27 students per class and the student to staff ratio is 13:1

### **ICT Course offerings:**

Digital Media Art

### **ICT Course Description:**

At CAT, students in the 9th grade take a full year of Digital Media Arts (DMA) where they learn to use Photoshop, iMovie, and other digital applications. As 10th graders, students are enrolled in a full year of traditional visual arts, and as seniors they have the opportunity to take an advanced visual arts course. New this year, students in the upper division grades (11th & 12th) will have the opportunity to enroll in an online elective course in our new FlexLab.

## Downtown High School

### Summary:

Downtown Continuation High School (DHS) is one of two continuation schools in the San Francisco Unified School District (SFUSD) charged with serving students whose success has been limited in the district's comprehensive high schools. A majority of DHS students are referred by Student Support Service Department (SSSD) due to habitual truancy and/or because they lack sufficient credits to graduate on time.

DHS utilizes a school-wide project-based model as our primary instructional delivery system. In pairs, DHS teachers are responsible for developing interdisciplinary, thematic, project-based units that are semester-long and self-contained, meaning students participate in one project all day, every day, for a semester at a time. Projects integrate language arts, social studies, science, math, and one elective such as art, music, or graphic design. At DHS we have found that our integrated, project-based curriculum in small closely-knit teams—with an emphasis on real-world connections, hands-on activities, and relevant field experiences—yields increased attendance and facilitates improved academic success.

### ICT Courses:

- Computer Applications 1-2
- Financial Planning
- Media Arts 1-4
- Multi-Media

### ICT Course Student Enrollment:

50 Students

### ICT Course Demographics:

See Appendix #1A

### ICT Course Descriptions:

See Appendix #1C

### Internship:

n/a

### Dual Enrollment Courses

See current CCSF Catalog

**Dual Enrollment Fall 2012:** 0

**Relationships with advisory groups:** n/a

### Lab Facilities:

2 Computer Labs (70 Comps)

**Certification Testing:** None

**Graduation Certification:** None

### Strategic Partnership:

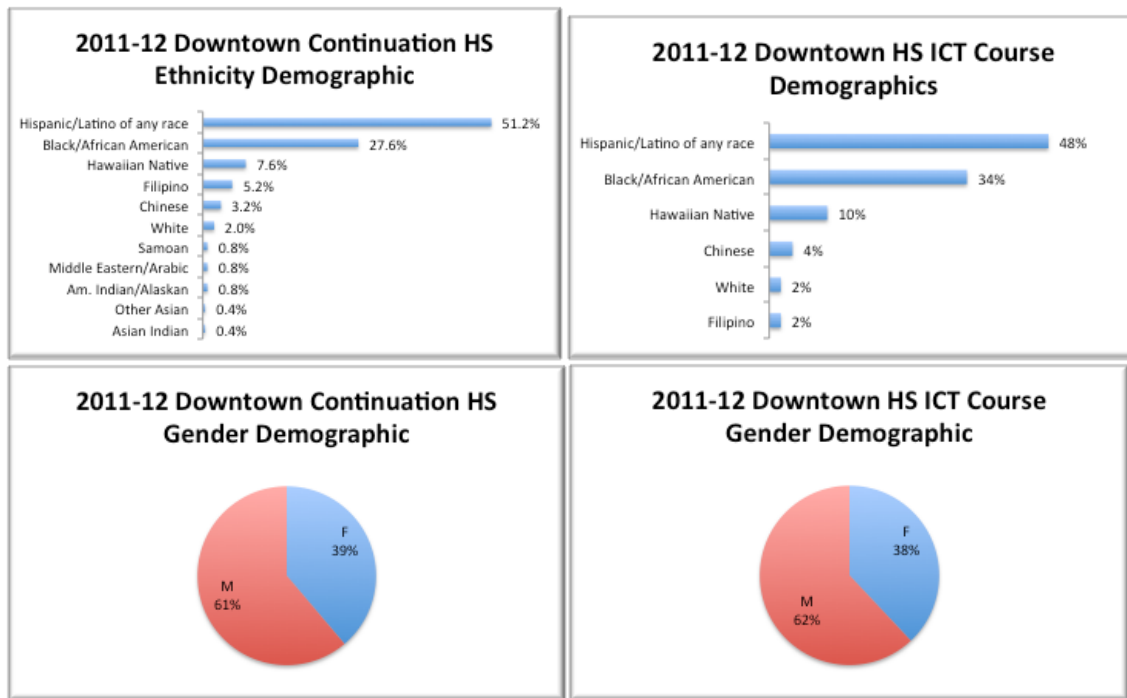
- Jewish Vocational Services
- BAVC
- KQED

Clubs related to ICT: None

### School Enrollment

- 2011 – 250
- 2010 – 261
- 2009 – 246

### Demographics:



### Downtown High School Course Descriptions

#### Financial Planning

- **Course: FINANCIAL PLANNING (BUSINESS ETHICS)** Description: This course introduces the importance of ethics in business. Students focus on the significance of ethics to stakeholders; examine who bears responsibility for monitoring ethics; and explore ethical situations common in organizations. Students examine how ethics affects various business disciplines and consider the impact of organizational culture. Students also explore ethics as social responsibility, the evolution of ethics in international business, and how the free market and ethics can coexist.

#### Computer Applications

- **Course: COMPUTER APPLICATIONS 1-4** Description: This course provides a thorough understanding and practice with the Microsoft Office Suite of programs, including: MS Word, MS PowerPoint, and MS Excel. Useful and common free office Web-based applications will be included in instruction also. Exposure to methods of using the World Wide Web as a resource tool will be explored as well as development of keyboarding skills. This course is part of the Academy of Information Technology course sequence. For academy students, successful completion of this course will make students eligible to participate in a paid summer internship at a local business between the student's junior and senior years.

#### **Media Arts 1-4**

**Course: MEDIA ARTS 1-4** Description: Students learn communication skills with video and other multimedia technologies. Students will become proficient in camera, audio, and video editing technologies. Students will gain skills in inquiry-based learning, project management, teamwork, client service, and problem solving. Students are also exposed to aesthetic valuing and creative challenges. Students will leave this class with a portfolio of work demonstrating skills that could be applied to areas as broad as print media or architecture

#### **Multi-Media**

- **Course: MULTIMEDIA 1/2** Description: This course provides a hands-on introduction to multi-media creation and digital video production. It guides students through all phases of multi-media/digital video production, from planning, executing/filming, to editing digital footage using various software products. Students explore several methods of sharing and broadcasting multi-media/ digital videos, including platform versions, CDs/DVDs, and web streaming. Students will also learn about publicizing their digital media for the most visibility. Career opportunities in multi-media and digital video production will also be explored throughout the year. This course is part of the Academy of Information Technology course sequence.

## Galileo Academy of Science & Technology High School

### School Summary:

Galileo Academy of Science and Technology is a large comprehensive high school in the Fisherman Wharf neighborhood of San Francisco with a student body of 2,132 students. Galileo provides students with career pathways in biotechnology, environmental science, health, hospitality and tourism, computer science, and creative media technology. In addition Galileo has an After-School Program titled Futurama that provides a Computer Design class

### ICT Courses:

- AP Computer Science
- Computer Applications
- Computer Art
- Intro to Programming
- Media Art
- Web Design

### ICT Course Academy/Pathway Student Enrollment:

- AOIT - 96
- Digital Media Pathway- 76

### 2012 Internship:

- AOIT – n/a
- AOF - n/a

### Dual Enrollment Courses:

- Computer Hardware
- Network Security
- Internet Basics & Beginning HTML, Writing for Broadcast Media
- Digital Media Skills
- Orientation to Multi-media,
- Digital Skills for Visual Media

### Dual Enrollment Fall 2012:

- AOIT - 5 students
- Digital Media – n/a

### Relationships with advisory groups:

- SFUSD AOIT

### Lab Facilities:

- 1 AOIT Classroom Lab  
-36 IMACS
- 1 Digital Media Lab  
-35 IMACS
- 1 Library Lab  
- 30 MacBooks
- 1 Broadcasting Lab

**Certification Testing:** N/A

**Strategic Partnership:**

- Adobe Youth Voices

**Clubs related to ICT:**

- Futurama Computer Design

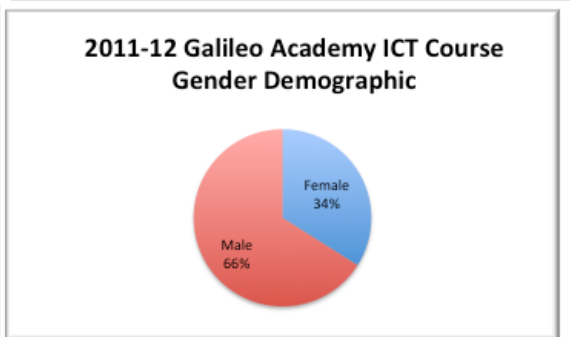
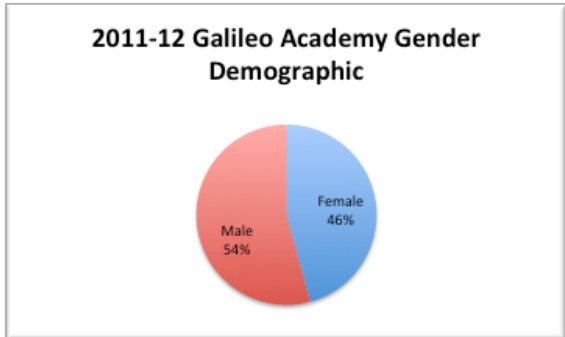
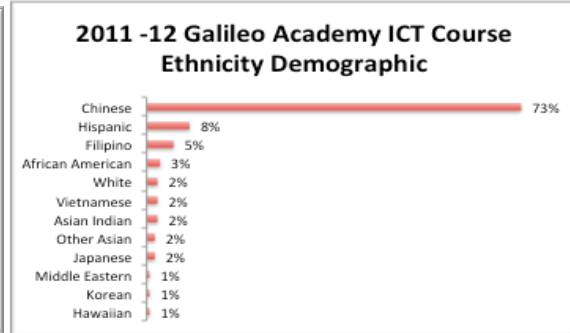
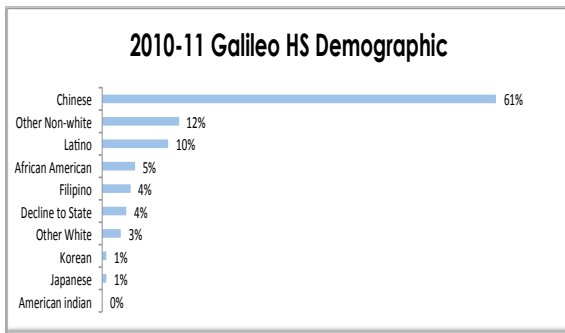
**School Enrollment**

2012 – 2,132

2011 – 2,149

2010 – 2,092

**Demographics:**



## Galileo HS ICT Course Descriptions

### Academy of Information Technology

<b>ROP/CTE Recommended Courses</b>	Grade 10	Grade 11	Grade 12	Post-secondary course, certificate or degree program
	<i>Introductory</i>	<i>Concentration</i>	<i>Capstone</i>	
	Computer Applications	Introduction to Programming	Advanced Placement Computer Science	AP Credit with 4 or 5 on AP Test.

### 10<sup>th</sup> Grade -- Computer Applications

In this course, students will learn the skills and knowledge necessary for working with modern computer operating systems, networks, and technology-based businesses. A wide variety of software will be used with the goal that students become fluent and flexible computer users. In terms of our school goals, this is about lifelong, adaptive learning. Since technology changes so quickly, those who learn to teach themselves new skills will be at an advantage. As a part of the Academy of Information Technology, this course is paired with a 10th grade English course and there will be some common assignments and projects. Students will be introduced to the AOIT rubrics for presentation, group work, and expository writing. This course is a prerequisite for *Introduction to Computer Programming*, which explores computation and programming in detail. Students who find they enjoy abstract and creative thinking should plan to continue in this sequence.

#### Topics:

- Coding
- EBCDIC
- Protocol
- Online Security
- JQuery
- Unicode
- Baudot code
- HTML
- Copyright
- Scratch (game coding)
- ASCII
- Morse code
- CSS
- Javascript

### 11<sup>th</sup> Grade -- Introduction to Programming

In this course, students will learn the fundamentals of computer programming from a practical perspective. The thematic focus will be video games, and the structure of projects in class will mirror the professional norms of the industry. Therefore, some significant projects will be done in groups and teams. In addition to the programming and design work, some reading (both mainstream media articles and technical information) and writing (both expository and reflective) will be required. In terms of our school goals, this course has a focus on creative, critical thinking. This course is a prerequisite for *Advanced Placement Computer Science*, which treats the subject in greater depth and formality equivalent to a first-semester college computer science class. Students who find they enjoy programming should plan to continue in this sequence.

Topics:

- Processing
- Openprocessing
- Sketchpad
- MouseX, MouseY variables
- Educational Games Design
- Class
- Arrays
- Light Cycles
- Game Design
- Object Oriented Loops
- Emergent Behavior

## 12<sup>th</sup> Grade -- AP Computer Science

The purpose of this course is to prepare students for the Advanced Placement Computer Science A exam on Tuesday, May 8, 2012. The format and scope of the test are specified by the College Board, which approves our curriculum each year. The language for the course is Java. Students will learn object-oriented program design, program implementation, program analysis, standard data structures, and algorithms. All students enrolled in this course will take the AP exam. Students will have 2-3 hours of class time per week for individual programming work and should expect to spend at least that much time outside of class reading and writing programs. The computer lab will be open after school on specific days. The software used in this course is free for students to install and use at home. It is critical for students to keep up with all programming assignments and reading. Late homework will not be accepted.

### Topics Covered:

#### I. Object-Oriented Program Design

The overall goal for designing a piece of software (a computer program) is to correctly solve the given problem. At the same time, this goal should encompass specifying and designing a program that is understandable, can be adapted to changing circumstances, and has the potential to be reused in whole or in part. The design process needs to be based on a thorough understanding of the problem to be solved.

##### A. Program design

1. Read and understand a problem description, purpose, and goals.
2. Apply data abstraction and encapsulation.
3. Read and understand class specifications and relationships among the classes (“is-a,” “has-a” relationships).
4. Understand and implement a given class hierarchy.
5. Identify reusable components from existing code using classes and class libraries.

##### B. Class design

1. Design and implement a class.
2. Choose appropriate data representation and algorithms.
3. Apply functional decomposition.
4. Extend a given class using inheritance

#### II. Program Implementation



The overall goals of program implementation parallel those of program design. Classes that fill common needs should be built so that they can be reused easily in other programs. Object-oriented design is an important part of program implementation.

#### **A. Implementation techniques**

1. Methodology
  - a. Object-oriented development
  - b. Top-down development
  - c. Encapsulation and information hiding
  - d. Procedural abstraction

#### **B. Programming constructs**

1. Primitive types vs. objects
2. Declaration
  - a. Constant declarations
  - b. Variable declarations
  - c. Class declarations
  - d. Interface declarations
  - e. Method declarations
  - f. Parameter declarations
3. Console output (System.out.print/println)
4. Control
  - a. Methods
  - b. Sequential
  - c. Conditional
  - d. Iteration
  - e. Understand and evaluate recursive methods

#### **C. Java library classes (included in the AP Java subset)**

### **III. Program Analysis**

The analysis of programs includes examining and testing programs to determine whether they correctly meet their specifications. It also includes the analysis of programs or algorithms in order to understand their time and space requirements when applied to different data sets.

#### **A. Testing**

1. Test classes and libraries in isolation.
2. Identify boundary cases and generate appropriate test data.
3. Perform integration testing.

#### **B. Debugging**

1. Categorize errors: compile-time, run-time, logic.
2. Identify and correct errors.
3. Employ techniques such as using a debugger, adding extra output statements, or hand-tracing code.

#### **C. Understand and modify existing code**

#### **D. Extend existing code using inheritance**

#### **E. Understand error handling**

1. Understand runtime exceptions.

#### **F. Reason about programs**

1. Pre- and post-conditions
2. Assertions

### **G. Analysis of algorithms**

1. Informal comparisons of running times
2. Exact calculation of statement execution counts

### **H. Numerical representations and limits**

1. Representations of numbers in different bases
2. Limitations of finite representations (e.g., integer bounds, imprecision of floating-point representations, and round-off error)

## **IV. Standard Data Structures**

Data structures are used to represent information within a program. Abstraction is an important theme in the development and application of data structures.

### **A. Simple data types (int, boolean, double)**

### **B. Classes**

### **C. Lists**

### **D. Arrays**

## **V. Standard Algorithms**

Standard algorithms serve as examples of good solutions to standard problems. Many are intertwined with standard data structures. These algorithms provide examples for analysis of program efficiency.

### **A. Operations on data structures previously listed**

1. Traversals
2. Insertions
3. Deletions

### **B. Searching**

1. Sequential
2. Binary

### **C. Sorting**

1. Selection
2. Insertion
3. Mergesort

## **VI. Computing in Context**

An awareness of the ethical and social implications of computing systems is necessary for the study of computer science. These topics need not be addressed in detail but should be considered throughout the course.

### **A. System reliability**

### **B. Privacy**

### **C. Legal issues and intellectual property**

### **D. Social and ethical ramifications of computer use**

## Hilltop Special Services

### Summary:

This is a comprehensive, continuous, and community-linked school-based program. Cal-SAFE, a program for expectant mothers, provides: Parenting Education and Life Skills Class, Prenatal Education, Health Education, Nutrition Education, Counseling and Meal Supplements, Career Counseling, Substance Abuse Prevention Education and Counseling, Mental Health Assessment, Intervention and Referrals, Peer Support Groups and Counseling, Child and Domestic Abuse Prevention Education, Counseling and Services, Enrichment and Recreational Activities, Child Care and child development, Individual Case Management, Peer Education, Centering, Pre-natal Care, Nurturing Support, Mother and Father Support Programs, Young Family Resources. Hilltop School provides an academic high school curriculum to students enrolled at the school site.

### ICT Courses:

Digital Arts  
Multimedia

### ICT Course Student Enrollment:

Media Arts 1: 14 students  
Media Arts 2: 28 students

### ICT Course Demographics:

97.9% Latino  
02.1% African American

### Strategic Partnerships:

Adobe Youth Voices  
Bay Area Video Coalition (BAVC)

### Lab Facilities:

1 Apple Desktop  
23 HP or Dell Desktops  
2 HP ProBooks  
6 Video & Digital Cameras  
2 Tablets  
1 Projector  
1 Smart Board  
6 Video & Digital Cameras

1 Color Printer  
1 BW Printer  
6 Video & Digital Cameras

### Software

1 Adobe CS, Imovie, Garage Band  
50 SL Adobe Photoshop & Premiere

## Abraham Lincoln High School

### Summary:

Abraham Lincoln High School is a large comprehensive high school located in San Francisco's Sunset district. The school has 1,996 students and offers a variety of ICT related career pathway programs. Including the Academy of Information Technology and the Academy of Finance.

### ICT Courses:

- Computer Applications 1 & 2
- Computer Art 1 & 2
- Ethics & Entrepreneurship
- Intro to Business/Accounting
- Multi-Media 1 & 2

### ICT Course Student Enrollment:

- AOIT - 142
- AOF - 147

### Internship:

- AOIT - 22
- AOF - 30

### Dual Enrollment Courses

- Computer Hardware
- Network Security
- Internet Basics & Beginning HTML, Writing for Broadcast Media
- Digital Media Skills
- Orientation to Multi-media,
- Digital Skills for Visual Media

### Dual Enrollment Fall 2012:

- AOIT - 51 students
- AOF - 54 students

### Relationships with advisory groups:

- SFUSD AOIT
- SFUSD AOF

### Lab Facilities:

- |                      |               |
|----------------------|---------------|
| 1 AOIT Classroom Lab | 1 Mobile Lab  |
| -36 IMACS            | -35 PC's      |
| 2 School wide Labs   | 1 Library Lab |
| -60 PC's             | - 35 PC's     |

### Certification Testing:

- MOUSE beginning 2012

### Graduation Certification:

- National Academy Foundation Certificate of Completion

### Strategic Partnerships:

- Adobe Youth Voices
- Adobe Media Mentors

- National Academy Foundation

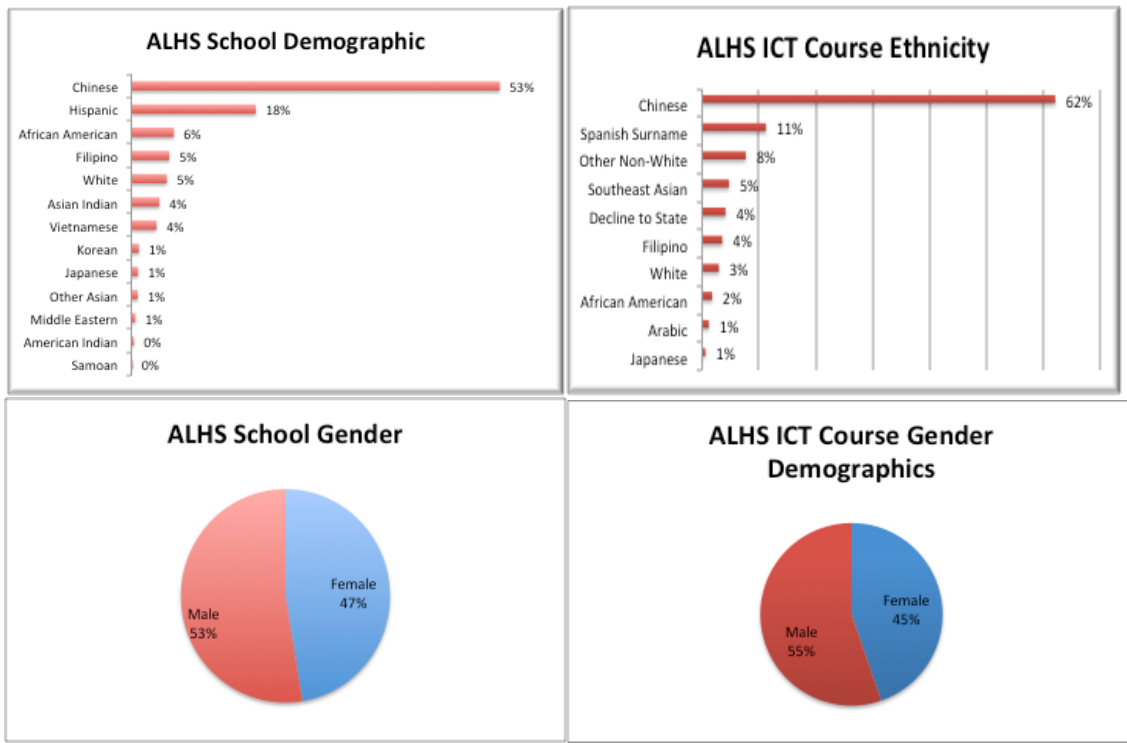
- California Partnership Academies

**Clubs related to ICT: N/A**

**School Enrollment**

- 2012 – 1,996
- 2011 – 2,049
- 2010 – 2,176:

**Demographics:**



**Abraham Lincoln High School  
Course Descriptions**

**Academy - Digital Media & Design**

<b>ROP/CTE Recommended Courses</b>	Grade 10	Grade 11	Grade 12	Post-secondary course, certificate or degree program
	<i>Introductory</i>	<i>Concentration</i>	<i>Capstone</i>	
	Computer Art	Computer Applications	Multi-Media & Web Design	

## **10<sup>th</sup> Grade -- Computer Art**

- This is a year-long introduction to visual art and graphic design using computer hardware and software. We work with digital media and techniques designed to build basic-intermediate skills, creative confidence, and provide hands-on experience with professional programs. These include digital photography, digital drawing/painting, posters/promotional materials, animation, and presentations using Adobe PhotoShop, Flash, Illustrator and Microsoft Powerpoint. Students learn about influential artists and various approaches to art and design. They gain experience with responsible web and real-world research and asset management. From there, students master the basic principles of graphic design and then delve into the elements of graphic design, such as color, typography and images. This course includes a culminating project where students create a design portfolio for a client, such as a non-profit organization, a small business, or a school club. They learn about identity design, and then create a logo, business card and at least one other piece of collateral to include in the portfolio they create for their client.

## **11<sup>th</sup> Grade -- Computer Applications**

- This course provides a thorough understanding and practice with the Microsoft Office Suite of programs, including: MS Word, MS PowerPoint, and MS Excel. Useful and common free office Web-based applications will be included in instruction also. Exposure to methods of using the World Wide Web as a resource tool will be explored as well as development of keyboarding skills. This course is part of the Academy of Information Technology course sequence at Abraham Lincoln High School. Successful completion of this course will make students eligible to participate in a paid summer internship at a local business between the student's junior and senior years. Students who are part of an academy at Abraham Lincoln are required to maintain a minimum G.P.A. of 2.0 to remain and participate in the academy.

### Topics:

- On-line safety
- Proper computer keyboarding for speed and accuracy
- Effectively using the Internet and evaluating sources of information
- Effective email use for the school and work setting
- Learning to use free on-line office software products
- Microsoft Word 2008
- Microsoft Excel 2008
- Microsoft PowerPoint 2008
- Database Software

## **12<sup>th</sup> Grade -- Multi-Media**

- This course provides a hands-on introduction to multi-media creation and digital video production. It guides students through all phases of multi-media/digital video production, from planning, executing/filming, to editing digital footage using various software products. Students explore several methods of sharing and broadcasting multi-media/digital videos, including platform versions, CDs/DVDs, and Web delivery. Students will also learn about publicizing their digital media for the most visibility. Career opportunities in multi-media and digital video production will also be explored

throughout the year. This course is part of the Academy of Information Technology course sequence at Abraham Lincoln High School and aligns with the National Academy Foundation course outline.

Topics:

- Planning multi-media/digital video projects
- Storyboarding project ideas
- Script writing
- How to use digital recording devices (for still images, video, and audio) and associated equipment
- Effective digital video production techniques
- Mixing and managing digital audio in multi-media/video projects
- Planning and creating audio podcasts
- GarageBand
- Audacity
- Adobe Soundbooth
- iMovie
- Adobe Premiere Pro
- Adobe AfterEffects
- Final Cut Studio

## **12<sup>th</sup> Grade - Web Design**

- This course will focus on the designing, building and launching of Web sites using various software products, Web-based publishing tools, and basic HTML coding. Students will learn how to maintain, update and trouble-shoot Web pages and the proper procedures and protocol for maintenance. Students will determine a business' requirements for their site, gather Web content, create Web pages, conduct usability testing, launch their Web Sites, and plan how to attract traffic to the Web site they have created. We will also explore various career opportunities in Web design. This course is part of the Academy of Information Technology course sequence at Abraham Lincoln High School and aligns with the National Academy Foundation course outline.

Topics:

- On-line safety
- Creating and using on-line blogs
- Differences in Internet browsers
- Adobe Fireworks to create graphics for the Web
- Adobe Dreamweaver CS3 to create maintain websites
- Adobe Flash to create animations to enhance Web pages
- Evaluating content validity on the Web
- Security threats to Web sites
- Electronic commerce on the Internet

## Lowell High

### School Summary:

The mission of Lowell High School is to encourage the individuals who attend to contribute their skills, creativity, and intellect to benefit both themselves and the wider community of which they are a part. Underlying Lowell's philosophy of education is the resolve that the young people of San Francisco continue to enjoy their traditional option of attending a college preparatory public high school. The emphasis requires an instructional program that promotes sound intellectual and aesthetic values while providing opportunities for self-discipline and individual decision-making. Lowell endeavors to create a just and equitable society where individual responsibilities are clearly defined and personal rights guaranteed. It endorses the concept of an integrated school where cultural and social diversity enrich the lives of all students.

### ICT Courses:

- AP Computer Science
- Computer Programming
- Computer Service & Repair

### ICT Course Student Enrollment:

- 188 Students

### Internship:

- EHSS
- NERSC

**Internship Demographic:** n/a

### Dual Enrollment Courses

- See current CCSF Catalog

**Dual Enrollment Fall 2012:** n/a

**Relationships with advisory groups:** None

### Lab Facilities:

1	IT Lab	1	Library Lab
3	School Lab		

**Certification Testing:** None

### Strategic Partnership:

- Cisco Networking Academy

### Clubs related to ICT:

- First Robotics
- Computer Club

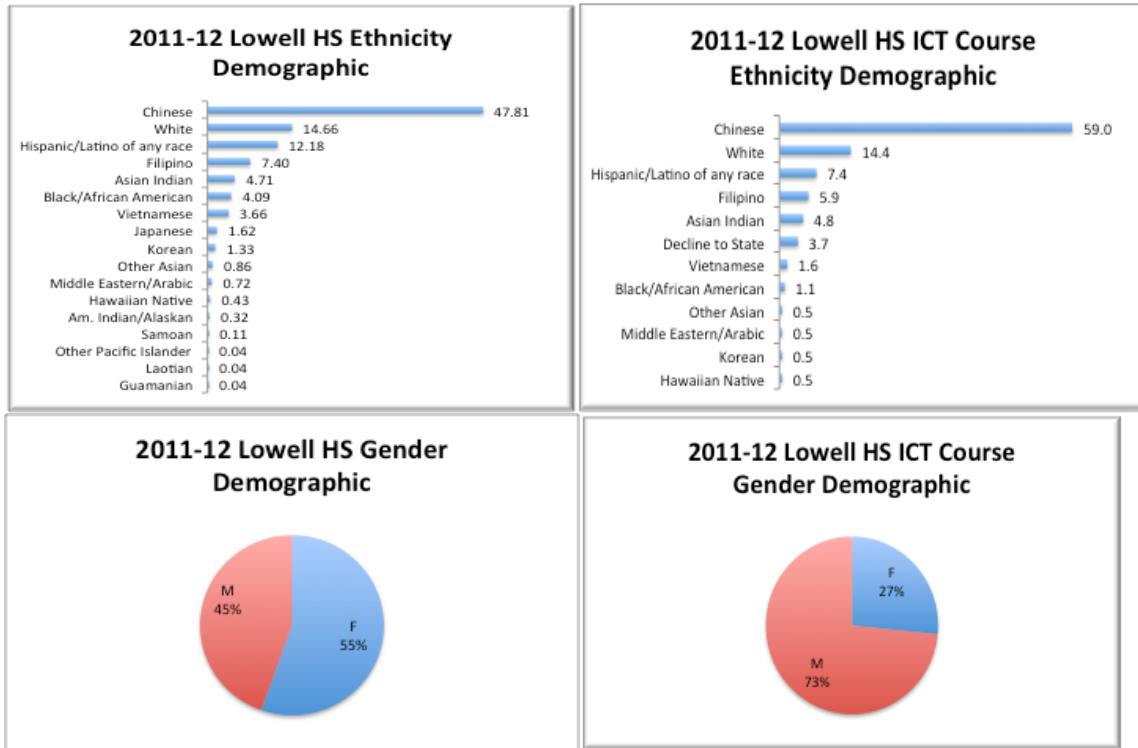
### School Enrollment:

- 2011 – 2784



- 2010 – 2583
- 2009 – 2593

**Demographics:**



**Lowell High School Course Descriptions:**

**Advanced Placement Computer Science**

- Computer Science A emphasizes object-oriented programming methodology with an emphasis on problem solving and algorithm development and is meant to be the equivalent of a first-semester course in computer science. It also includes the study of data structures and abstraction.

**Computer Programming**

- This course introduces the basic concepts of computer science including the ethical and social impacts of computing. Emphasis is given to problem-solving, problem analysis, and algorithm design. This course offers programming concepts using java or similar programming languages. Students will learn about and use variable, data types and operators. Students will be introduced to arrays, flow-control, exception handling and differing data structures, and apply this knowledge in hands-on experiences.

**Computer Service & Repair:**

- N/A

## Marshall High School

### Summary:

Thurgood Marshall Academic High School is a four-year college preparatory high school with a diverse student body. Its highly dedicated faculty/staff and active PTSA believe that every Marshall student should be equipped with the essential skills, knowledge, and values needed to make wise college, career, and vocational decisions. Students have access to our College & Career Center, and a fully staffed Wellness Center (with a nurse) as well as a Peer Resources Program. Student life at Marshall is enhanced by a wide array of extracurricular, community service, and athletic activities during and after school. Marshall is committed to achieve school-wide learning results for all students that reinforce the importance of responsibility, communication, critical thinking, and collaboration in all fields of human endeavor.

### ICT Courses:

- Animations 1- 4
- Computer Art 1-4

### ICT Course Student Enrollment:

- 100 Students

**Internship:** n/a

### Dual Enrollment Courses

- See current CCSF Catalog

**Dual Enrollment Fall 2012:** None

**Relationships with advisory groups:** None

### Lab Facilities:

4 Computer Labs

**Certification Testing:** None

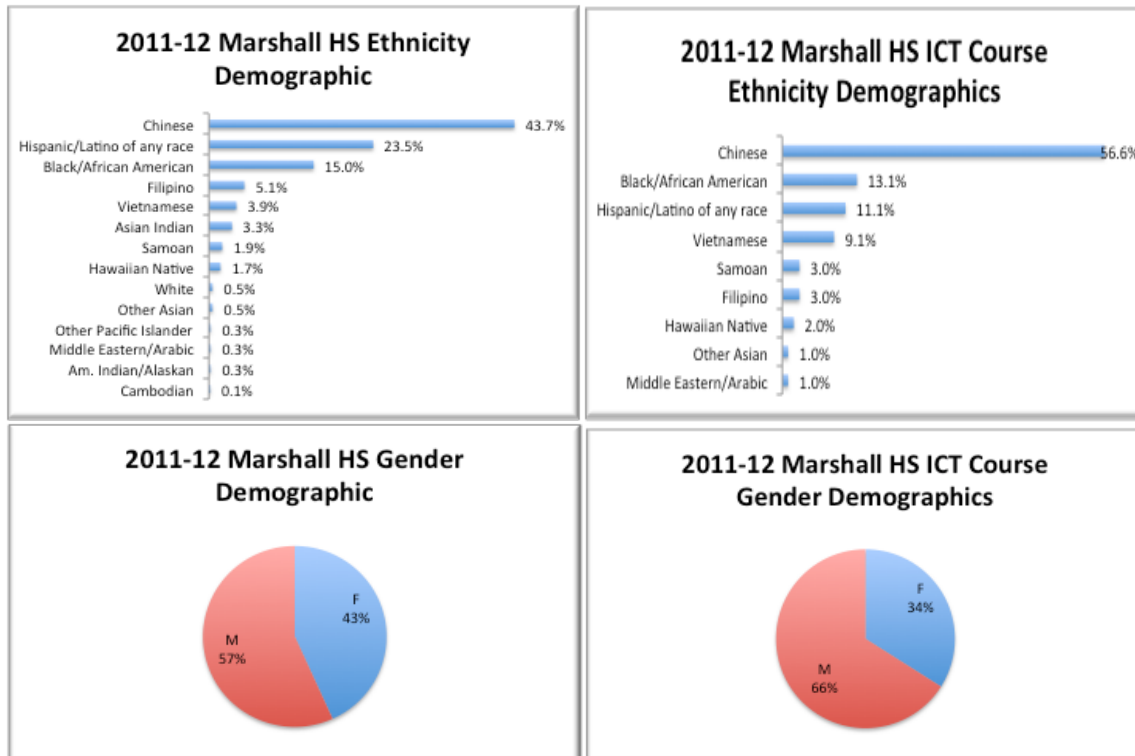
**Strategic Partnerships:** n/a

**Clubs related to ICT:** None

### School Enrollment

- 2011 – 787
- 2010 – 788
- 2009 – 838

### Demographics:



## Marshall High School Course Descriptions

### Animations 1-4

- Students learn animation skills in a hands-on studio environment that emphasizes a strong foundation in basic artistic theory and drawing technique. Students will explore and create their own work in diverse cartoon medium using a variety of techniques.

### Computer Art

- The student is introduced to the computer as a technological medium for original creative expression. The course helps prepare students for the technological job market through a practical, hands-on understanding of the role of artists and technicians in the development of computer art.

### Computer Art 3/4

- Students learn communication skills with web-based technologies. Students will become proficient with various computer applications, will develop a higher-level understanding of color and design for digital media. In creating web-based finished products, students will gain skills in inquiry-based learning, project management, teamwork and problem solving. Students are also exposed to aesthetic valuing and creative communication.

## Metropolitan Arts & Tech

### **Summary:**

Metropolitan Arts and Technology High School is a tuition-free public charter high school in San Francisco whose mission is to transform students' lives by preparing them for success in college and in life. Metro Arts and Tech offers students a rigorous academic experience and a diverse, compassionate community in which to grow. Students are inspired and empowered to be leaders in their high school education and their communities.

### **ICT Course Offerings:**

Digital Media Art

Advanced Digital Media At

### **ICT Course Descriptions:**

Metro is not a school that specializes in art and technology. Students don't have to be a computer expert or an artist to attend. Rather, teachers use art and technology as tools for expression and engagement in the classroom; it's woven into all aspects of what they teach. A student might use art to demonstrate understanding of principles or geometry, or create a video on iMovie to show what they have learned in Social Studies. Furthermore, all students take classes where they explore visual, digital and media arts. Students have the opportunity to take Digital Media Arts, Visual Arts and Advanced Digital Media Arts.

## Mission High School

### Summary:

Mission High School is located right in front of the beautiful Dolores Park where the neighborhoods of the Mission, Noe Valley and the Castro meet. We are very proud of how our school reflects the cultural diversity of our neighborhood. We instill positive social values, acceptance and an appreciation for this diversity. Our academic focus school-wide is aimed at preparing ALL of our students for college and careers with rigorous courses including a rich array of AP and Honors courses. Come visit us at the end of the year when all of our students share their rigorous portfolio work with the entire Mission community. We also have numerous business and college partnership to assist us in making sure that our students set high goals throughout their high school years and upon graduation.

### ICT Courses:

- Computer Art 1-4
- Media Arts 1-4

### ICT Course Student Enrollment:

- 164 Students

**Internship:** n/a

### Dual Enrollment Courses

- See current CCSF Catalog

### Dual Enrollment Fall 2012:

- 10

**Relationships with advisory groups:** n/a

### Lab Facilities:

10 Computer Labs

**Certification Testing:** None

### Strategic Partnerships:

- Mission Local
- KQED
- MAC (Media Across Curriculum)

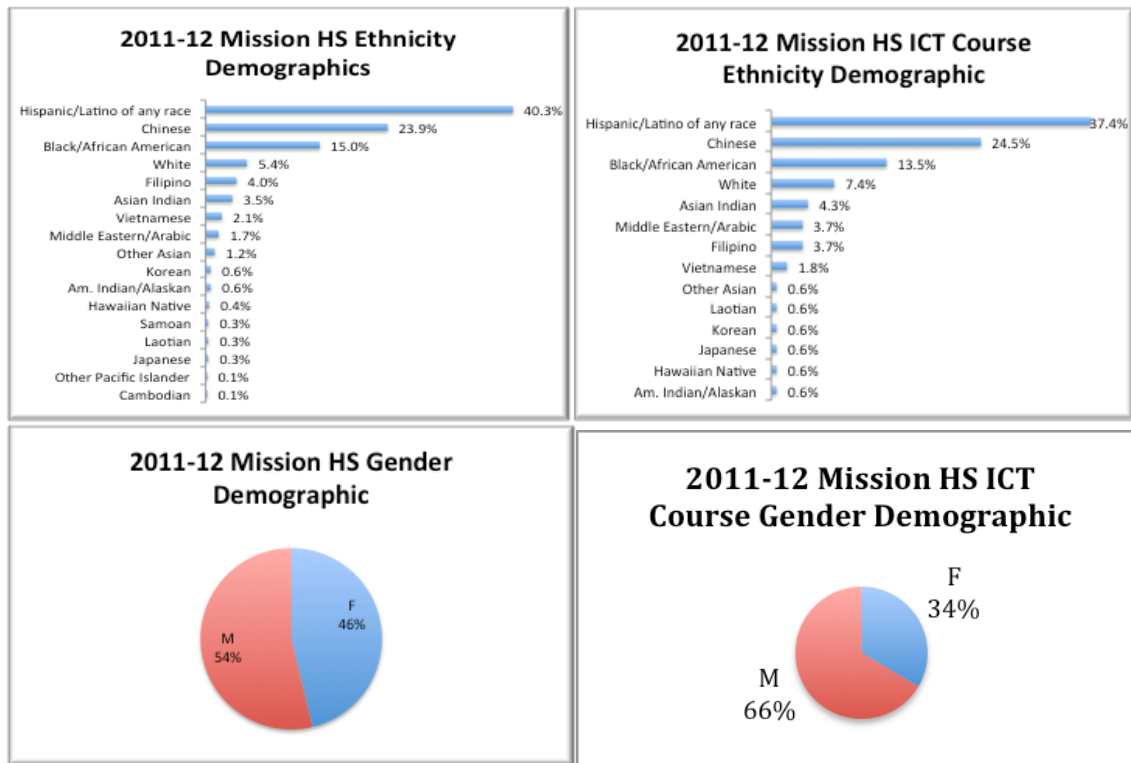
### Clubs related to ICT:

- Video Production Club
- Beats & Rhymes Club
- Youth Media Services (hiring program)
- Radio Station

### School Enrollment

- 2011 – 942
- 2010 – 867
- 2009 – 880

## Demographics:



## Mission High School Course Descriptions

### Computer Art 1/2

- The student is introduced to the computer as a technological medium for original creative expression. The course helps prepare students for the technological job market through a practical, hands-on understanding of the role of artists and technicians in the development of computer art.

### COMPUTER ART 3/4

- Students learn communication skills with web-based technologies. Students will become proficient with various computer applications, will develop a higher-level understanding of color and design for digital media. In creating web-based finished products, students will gain skills in inquiry-based learning, project management, teamwork and problem solving. Students are also exposed to aesthetic valuing and creative communication.

### Media Arts 1-4

- Students learn communication skills with video and other multimedia technologies. Students will become proficient in camera, audio, and video editing technologies. Students will gain skills in inquiry-based learning, project management, teamwork, client service, and problem solving. Students are also exposed to aesthetic valuing and creative challenges. Students will leave this class with a portfolio of work demonstrating skills that could be applied to areas as broad as print media or architecture

## John O'Connell High School

### Summary:

JOCHS is a small, academic-focused high school with exciting career pathways. All students are enrolled in the University of California's A-G coursework to ensure students receive a college preparatory curriculum. Advanced Placement courses are available in Biology, English Literature, English Language, Calculus, Statistics, Spanish Language, Spanish Literature, 2D and 3D Studio Art. Along with a rigorous core curriculum, JOHS offers relevant pathway courses. Students can choose courses in Drama, Art, Computer Art, Networking, Carpentry, Stationary Engineering, and Peer Resources. Advanced courses include Biotechnology, Physiology, Advanced Media Arts, Advanced Art, Pre-Engineering, and Programming.

### ICT Courses:

- Computer Art 1-2
- Design Maintenance
- Network IS 1-4

### ICT Course Student Enrollment:

- 93 Students

**Internship:** n/a

### Dual Enrollment Courses

- See current CCSF Catalog

**Dual Enrollment Fall 2012:** n/a

### Relationships with advisory groups:

- SFUSD AOIT

### Lab Facilities:

- 1 IT Lab
- 3 School Lab
- 1 Library Lab

**Certification Testing:** None

**Strategic Partnerships:** None

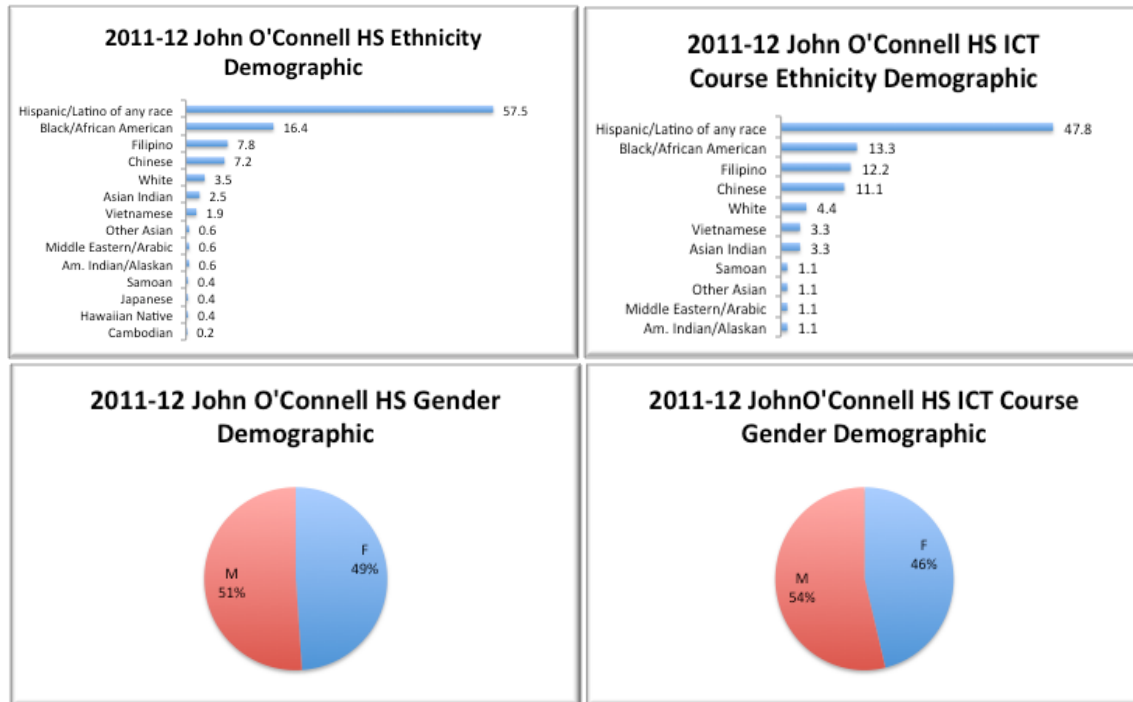
### Clubs related to ICT:

- BAVC

## School Enrollment

- 2011 – 517
- 2010 – 604
- 2009 – 623

## Demographics:



## John O'Connell High School Course Descriptions

### Computer Art 1&2

- The student is introduced to the computer as a technological medium for original creative expression. The course helps prepare students for the technological job market through a practical, hands-on understanding of the role of artists and technicians in the development of computer art.

### Networking & Information Systems

- This is a four-semester networking certification program leading to Cisco Certified Networking Associate (CCNA) Certification. Students develop an understanding of the OSI model, networking components, premise wiring, industry standards, topologies, network design, router setup, router configuration, network planning and design.

### Design Maintenance

Course: N/A



## George Washington High School

### Summary:

George Washington HS (GWHS) located in the outer Richmond District offers its students an outstanding comprehensive education in a culturally enriching environment. GWHS has more than 100 course offerings, with 52 sections of honors and advanced placement classes. Students at GWHS also have the opportunity to participate the Academy of Information Technology which focuses on Digital Media, Film Production and Computer Art campus clubs and organizations and a full inter-scholastic athletic program, with 22 teams in 15 sports. Washington also has an active Beacon program, PTSA and Alumni Association. The mission of GWHS is to provide a learning environment that is safe, secure, and promotes high academic and ethical standards. Preparing all students to become successful lifelong learners in a global, multicultural society.

### ICT Courses:

- Broadcast Media
- Computer Applications
- Computer Art
- Video Production

### ICT Course Student Enrollment:

- AOIT – 75
- All others – 100

### Internship:

- AOIT: 10

**Internship Demographic:** n/a

**Dual Enrollment Courses:** See current CCSF Catalog

### Dual Enrollment Fall 2012:

- 5 students

### Relationships with advisory groups:

- SFUSD AOIT

### Lab Facilities:

- IT Lab
- CTE Lab
- Library Lab

**Certification Testing:** None

**Clubs related to ICT:** None

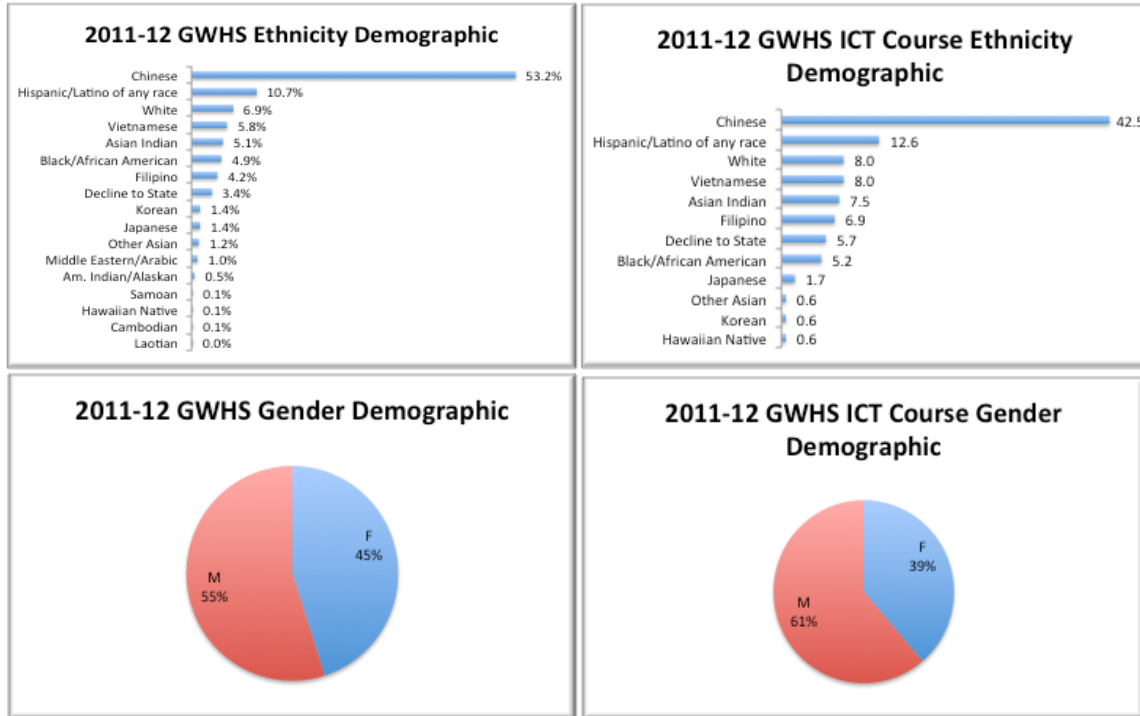
### Strategic Partnerships:

Adobe Youth Voices      NAF  
California Partnership  
Academy

**School Enrollment**

- 2011 – 2080
- 2010 – 2307
- 2009 –2286

**Demographics:**



**George Washington High School Course Descriptions**

Academy of Information Technology

ROP/CTE Recommended Courses	Grade 10	Grade 11	Grade 12	Post-secondary course, certificate or degree program
	<i>Introductory</i>	<i>Concentration</i>	<i>Capstone</i>	
	Computer Applications	Computer Art	Media Arts -Broadcasting -Video Production	

## 10<sup>th</sup> Grade -- Computer Applications

- Introduction to Digital Media & Production provides an overview of information technology today. It serves as the foundation for all of the core courses offered by the Academy of Information Technology. This course provides students with an introduction to the common hardware and software that most of our digital media is designed and built with. Students will learn to work with different operating systems, write some basic programming code, organize project folders and manage workspaces, and produce audio and video projects using the latest digital capture devices and software applications. In addition to introducing students to technical skills, the course will develop students' ability to communicate effectively and work collaboratively. Introducing these "soft skills" to AoIT students is critical as we prepare them for internships and future careers in information technology. During the course, students consider contemporary IT issues such as security and privacy, the effects of IT on society, and technological inequality. Lastly, students get a chance to discover the types of careers that exist in IT today.

## 11<sup>th</sup> Grade – Computer Art 1&2

- The student is introduced to the computer as a technological medium for original creative expression. The course helps prepare students for the technological job market through a practical, hands-on understanding of the role of artists and technicians in the development of computer art.

## 12<sup>th</sup> Grade – Broadcast Media

- Broadcast Media and Production is an integral part of the Communication Arts Academy pathway for video and audio production. As an English department offering, the course focuses on developing students' ability to communicate using writing as the basis for any message. Students explore the history of broadcast in both audio and video media and examine the roles they play in our society today. They also explore the current state of the radio and television as multi-media becomes a larger part of the broadcast industry. Students combine theory with practice in the multi-media lab by creating a series of small projects in both audio and video media and they will focus on an area of interest to create their culminating project in the media of their choice.

## 12<sup>th</sup> Grade – Video Production

- This is a professional quality video production class embracing all aspects of video film making, both documentary and dramatic. The highly collaborative and creative skills of video production are taught. Modeling outstanding examples of feature films, students incorporate the finest film art and understanding into their video work.

## **Raoul Wallenberg High School**

### **Summary:**

Raoul Wallenberg Traditional High School offers a rigorous and personalized educational program that prepares our diverse students for college success and career achievement. We are committed to ensuring that our students have equitable educational outcomes and to enhancing each student's creativity, self-discipline, and ability to act as responsible citizens. We provide students with a supportive, safe and caring small school environment that emphasizes academics, athletics, the arts and student involvement in clubs and extracurricular activities. We offer Honors and Advanced Placement courses in all core subjects. Our Bio-Technology Pathway offers students a health services curriculum and our partnership with Kaiser Hospital provides summer internships. Students are challenged, encouraged and inspired by a dedicated and talented faculty and staff.

### **ICT Courses:**

- Computer Art 1-2

### **ICT Course Student Enrollment:**

- 33 Students

**Internship:** n/a

### **Dual Enrollment Courses**

- See current CCSF Catalog

### **Dual Enrollment Fall 2012:**

- None in IT

**Relationships with advisory groups:** None

### **Lab Facilities:**

1	Media Center	2	Computer Lab
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**Certification Testing:** None

### **Strategic Partnership:**

- Beacon
- Excel After-School

**Clubs related to ICT:** None

### **School Enrollment**

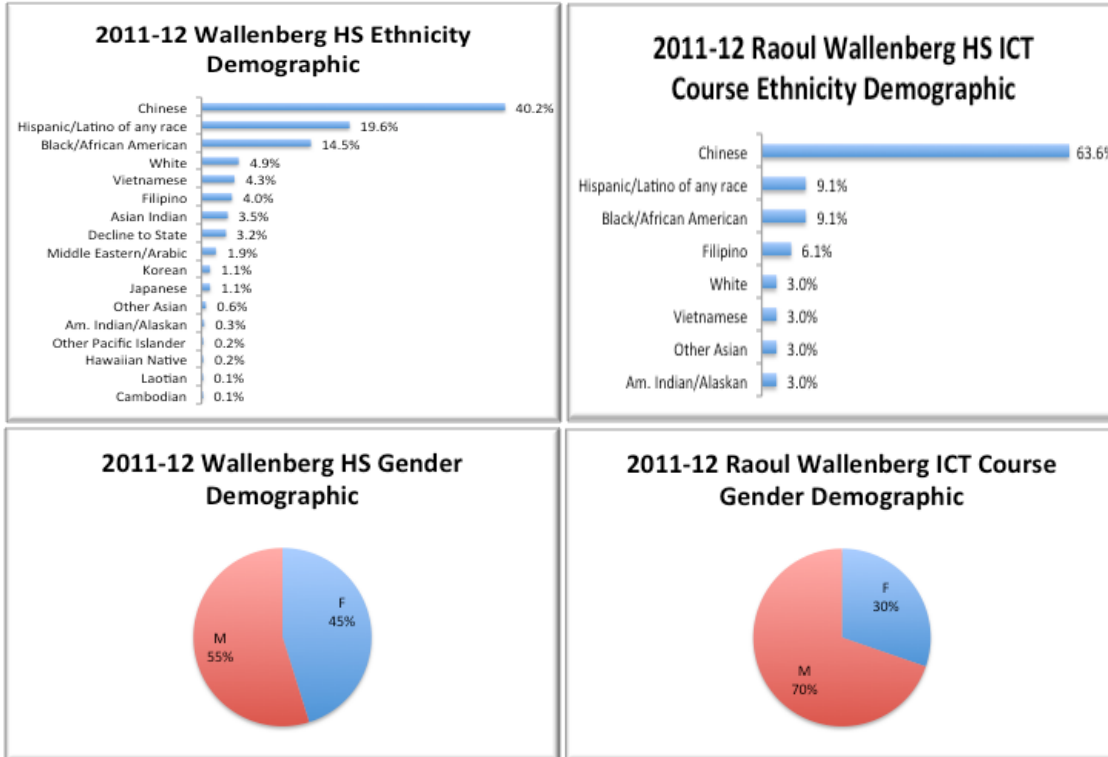
- 2011 – 676
- 2010 – 680
- 2009 – 636

**Graduation data:**

Provided by: <http://dq.cde.ca.gov>

- 2011 – 90%
- 2010 - 82%

**Demographics:**



**Wallenberg High School Course Descriptions**

**COMPUTER ART 1/2**

- The student is introduced to the computer as a technological medium for original creative expression. The course helps prepare students for the technological job market through a practical, hands-on understanding of the role of artists and technicians in the development of computer art.  
Grade Level: 11-12  
Pre-Requisites: Placement Test  
A-G status: F

## Ida B. Wells High School

### Summary:

Ida B. Wells High School is an alternative school established to serve students who are age 16 and older who are seeking to complete the high school portion of their education in a setting with smaller classes, an array of credit recovery opportunities, and a supportive 'family-like' learning environment. Our commitment is to provide each of our students with the opportunity to establish academic and career goals, and to acquire the skills and self reliance needed to achieve those goals. Students who transfer to Wells are asked to make a commitment to our 'Three A's' - Attendance, Attitude (positive), and Achievement in order to facilitate their credit recovery. Our educational program embraces the concept that student success depends upon the collaboration and commitment of students, teachers, parents and community partners.

### ICT Courses:

- Graphic Arts 1-2

### ICT Course Student Enrollment:

- 21 Students

**Internship:** n/a

### Dual Enrollment Courses:

- See current CCSF Catalog

### Dual Enrollment Fall 2012:

- None in IT

**Relationships with advisory groups:** N/A

### Lab Facilities:

- 1 Computer Lab

**Certification Testing:** None

**Strategic Partnerships:** None

### Clubs related to ICT:

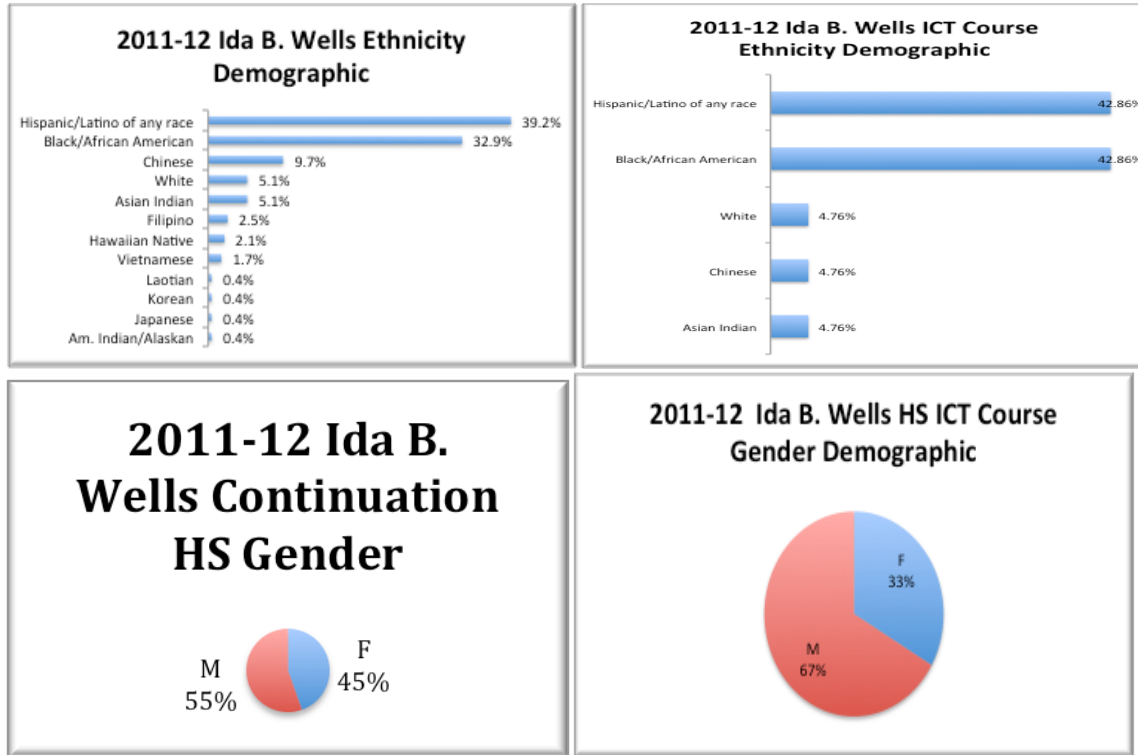
- Media Arts

### School Enrollment

- 2011 – 240

- 2010 – 319
- 2009 – 377

**Demographics:**  
240 Students



## Ida B. Wells High School Course Descriptions

### Graphic Arts 1-2

Students learn a variety of computer design programs as well as the ability to draw freehand illustrations. Students develop understanding of the basic principles of drafting, design, space development, measurement as well as intuitive skills necessary in the design field.

Grade Level:

Pre-Requisites: None

A-G status: None

## Appendix 3: CCSF Fact Sheets

### Administrative Support and Office Technology Program, Business Dept. – Fact Sheet

#### **Summary:**

The Administrative Support and Office Technology credit programs are designed for students working or planning to work in office-support positions in business, industry and government. Typical job titles include administrative assistant, secretary, office assistant, office clerk and office specialist.

From a selection of twenty-two classes offered throughout the year, students prepare for employment or transfer to four-year colleges and universities.

#### **Degree:**

The two-year Administrative Support program leads to an Associate in Science degree. This program is designed for students working or planning to work in administrative support positions in industry and government. Areas of emphasis include word processing, spreadsheets and database management.

Computer classes are taught hands-on in computer labs. Students have the opportunity to polish their written communication skills by taking a series of three writing-based classes that cover basic grammar, letter and memo development and report writing as well as learn the computer skills needed to succeed in a challenging office environment.

#### **Transfer to Other Colleges and Universities:**

Most Administrative Support and Office Technology courses are credit and degree applicable and selected courses transfer to the CSU and/or UC systems.

#### **Admission:**

Enrollment is open to all interested students. Please note that some classes have prerequisites, co-requisites and advisories.

Students are encouraged to work with a college counselor and a department program advisor to establish an education plan during the first semester of study.

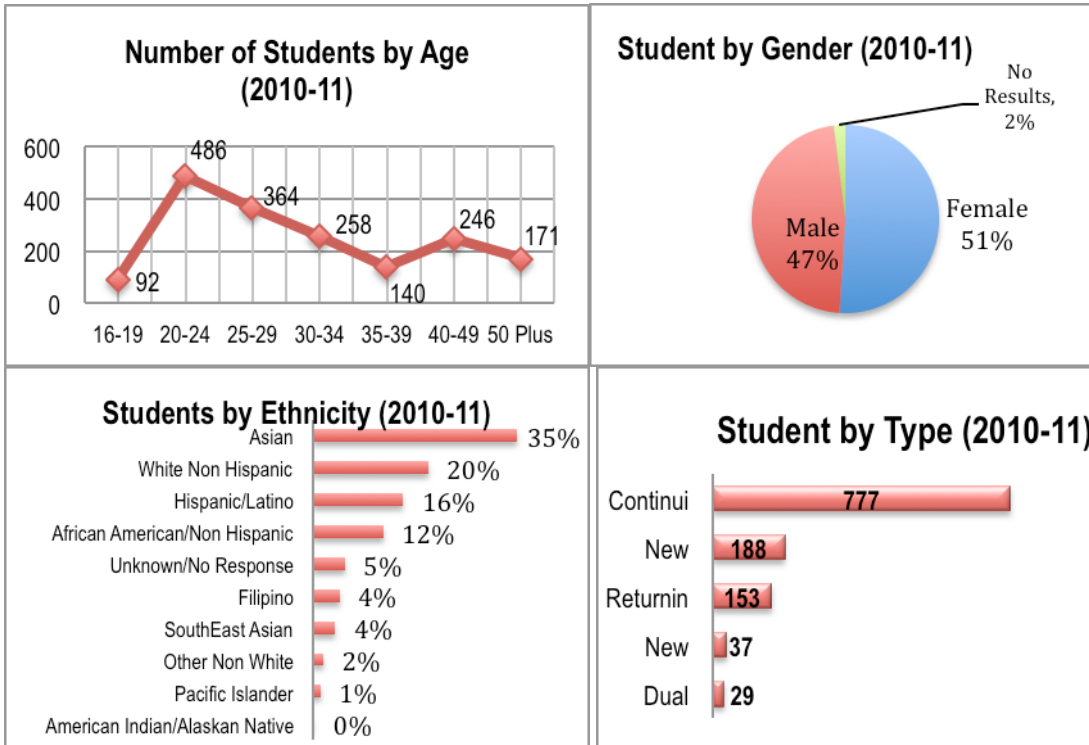
#### **Certificate:**

The Office Technology Certificate program is designed for students who desire recognition for completing a rigorous course of study in business office skills but who may not be interested in pursuing a degree.

#### **Student Demographics:**



Approximately 1,750 students a year enroll in an Administrative Support and Office Technology class at CCSF. In 2010-11, nearly 9 percent of the students who enrolled in these classes were new students. Fifty-four percent were younger than 30 years old. Sixty percent were women.



**Certificates, Degrees and Transfers:**

Administrative Support and Office Technology degrees and certificates awarded in 2011: 6

Administrative Support and Office Technology students who transferred to a four-year school in 2011: 76

**Internships:**

Students can credit through the General Career Work Experience course (WKEX 301, 302 or 303), although it is not a requirement for the degree or certificate.

**Employment and Income:**

Detailed information about the type of jobs and income expected in the Administrative Support and Office Technology fields can be found on our Career and Technical Education Program FAQ web page: <http://goo.gl/l36Uw>

**Dual Enrollment Options:**

Any introductory course is available for dual enrollment.

**Number of high school students enrolled in Administrative Support and Office Technology classes in 2010-11: 0**

**Faculty, Staff and Facilities:**

Faculty: 16

Staff: 1

**Computer labs:**

The Business Department has 14 computer lab classrooms on the Ocean, Downtown and Mission campuses. There are also open lab areas.

**Campuses:**

Classes are taught on Ocean, Downtown and Mission campuses. Online classes are also available.

**Clubs and Organizations:**

The Business Department hosts Alpha Beta Gamma (A Business Honor Society Club) is open to all majors in the Business Department.

**For More Information contact:**

Program Coordinator and Student Advising:

Gina Hector

Administrative Support, Office Technology and Computer Applications

Email: [ghector@ccsf.edu](mailto:ghector@ccsf.edu)

Phone: (415) 452-5927

City College of San Francisco

50 Phelan Avenue C106

San Francisco, CA 94112

Web site: [www.ccsf.edu/business](http://www.ccsf.edu/business)

## Broadcast Media Arts Department – Fact Sheet

### Summary:

CCSF's Broadcast Electronic Media Arts Department (BEMA) prepares students for university transfer and provides lifelong learners and degree holders the opportunity to upgrade workplace skills and prepare for career transition.

From a selection of 47 classes offered throughout the year, students can learn about the design and creation of content for electronic media with a focus on writing, storytelling, teamwork, leadership, production craft skills and emerging technologies. Media literacy is emphasized throughout the curriculum.

Graduates either transfer to a university or seek employment in radio, television, video production, cable, broadcast news, advertising, public relations, sound reinforcement, music recording, interactive media, corporate and industrial media production.

### Transfer to Other Colleges and Universities:

All Broadcast Electronic Media Arts courses are credit and degree applicable and selected courses transfer to the CSU and/or UC systems.

The BEMA Department has a strong transfer agreement for students who want to transfer to San Francisco State University (SFSU) as Broadcast and Electronic Communications majors. BEMA also coordinates with SFSU-BECA to offer a tour and visit to SFSU-BECA for BEMA students interested in transferring to that program.

### Admission:

Enrollment is open to all interested students. Please note that some classes have prerequisites, co-requisites and advisories.

Students are encouraged to work with a college counselor and a department program advisor to establish an education plan during the first semester of study.

### Certificates:

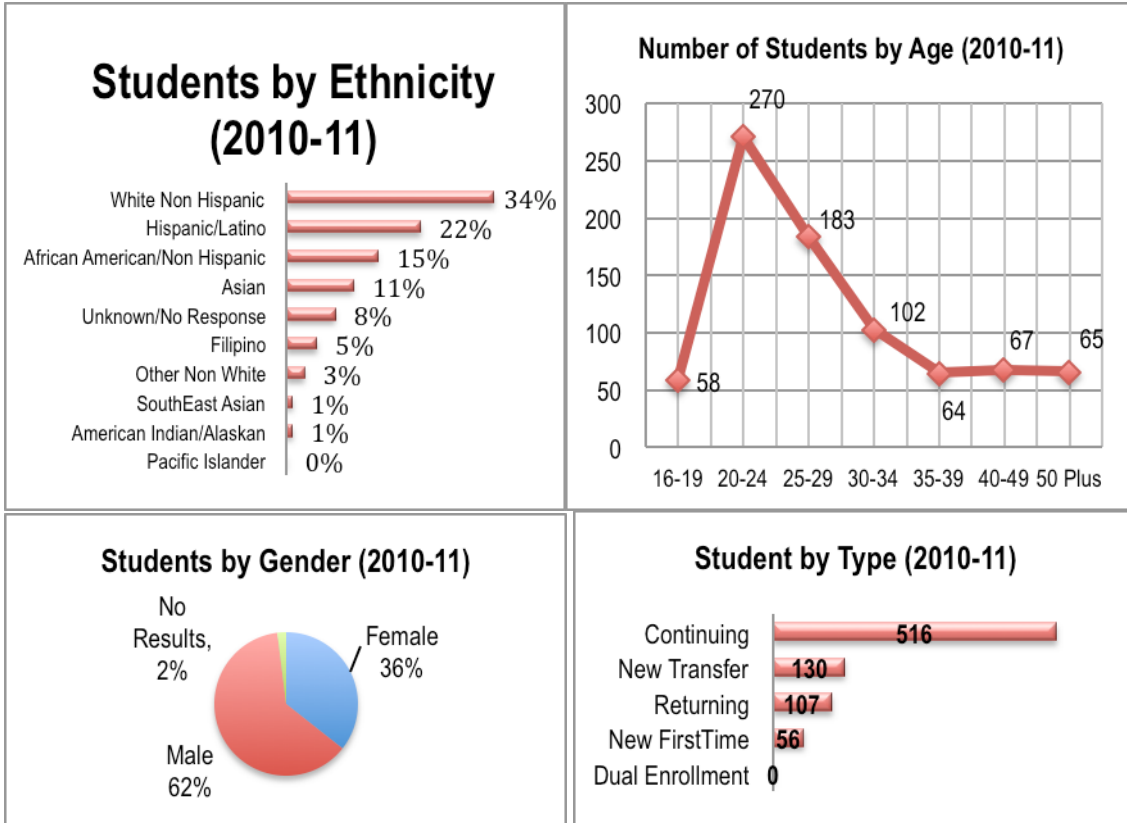
Certificate programs are recommended for those seeking to acquire entry-level skills or upgrade and retool skills and for lifelong-learners preparing for career transition. Each course sequence is designed to provide students with an opportunity to develop and refine essential workforce skills for employment in the electronic media industry.

The following certificates are currently offered:

- Broadcast Journalism
- Broadcast Motion Graphics
- Digital Radio
- Live Sound
- Sound Design
- Sound Recording
- Television Production
- Video Post-Production
- Video Production and Editing

**Student Demographics:**

Approximately 800 students a year enroll in a BEMA class at CCSF. In 2010-11, 7 percent of the 800 students who enrolled in BEMA classes were first-time students. Approximately 60 percent were younger than 30 years old. Sixty-two percent were men.



**Certificates, Degrees and Transfers:**

BEMA certificates awarded in 2010-11: 35

Number of BEMA students who transferred to a four-year school in 2011: 35

**Internships and Programming:**

BEMA offers five sections of internship classes each semester. Internships are both on campus and at industry sites and are both paid and unpaid. About 60 students enroll and participate each semester.

- Internships are available with the Department’s radio station, KCSF Radio and television station, EATV Channels 27 and 75.
- BEMA students provide video support services for 127 classrooms on Ocean Campus.
- Advanced students produce video promotional materials for departments and programs throughout the college.

- Students assist with channel operations and production of San Francisco's two 24/7 Educational Access Channels for the City and County of San Francisco's Department of Technology.
- Students work with the League of Women Voters, Government and Public Access Channel operators to produce political forums during election years.

### **Employment and Income:**

Detailed information about the type of jobs and income expected in the Broadcast Electronic Media Arts field can be found on CCSF's Career and Technical Education Program FAQ web page: <http://goo.gl/l36Uw>

### **Dual Enrollment Options:**

The following classes are available for BEMA's dual-enrollment program:

- BCST 110 – Writing for Electronic Media
- BCST 119 – Digital Media Skills
- BCST 120 – Audio Production
- BCST 135 – Sound for the Web
- BCST 136 – Video for the Web

The BEMA Department is also currently working with Bay Area Video Coalition (BAVC) to establish a pathway/bridge program with a grant-funded cohort of students age 18-24 that begin their work at BAVC and then transition into a CCSF certificate or transfer program.

**Number of high school students enrolled in BEMA classes in 2010-11: 0**

### **Faculty and Staff:**

Faculty: 13

Staff: 10

### **Computer labs:**

BEMA facilities have recently undergone extensive upgrades that include:

- Digital video-editing lab
- Two digital audio-production labs
- Hybrid sound recording studio
- HD ProTools recording studio
- KCSF Radio on the internet
- Two digital tele-production studios
- Digital cable FM radio station
- High-Definition Television Studio (Ocean Campus)
- Standard Definition Digital Television Studio (Mission Campus)
- Numerous field video cameras, microphones and lighting kits for student checkout
- A Peer Mentor program provides out-of-classroom support for students enrolled in production classes.

**Campuses:**

Classes are taught on both the Mission and Ocean campuses. Online classes are also available.

**Clubs and Organizations:**

- C3 Editors is City College's student run video-editing and post-production club.
- Friends of KCSF Radio

**For more information contact:**

Department Chair and Student Advising:  
Francine Podenski  
Broadcast Electronic Media Arts Department  
50 Phelan Ave, Ax160  
San Francisco, CA 94112  
Telephone: (415) 239-3527  
E-mail: [fpodensk@ccsf.edu](mailto:fpodensk@ccsf.edu)  
Web site: [www.ccsf.edu/broadcast](http://www.ccsf.edu/broadcast)

## Computer Networking and Information Technology Fact Sheet

### Summary:

With more than 50 classes to choose from, the Computer Networking and Information Technology Department (CNIT) at CCSF offers courses in computer technical support, networking, security and web development.

Courses range from entry-level to professional development. The Department offers an Associate in Science degree, CCSF certificates and introductory and advanced courses in networking, wireless, security, IT support, hardware, web development and classes covering Apache, Cisco and Microsoft technologies.

Students who complete department certificates demonstrate technical and professional competencies that meet industry standards for employment and are prepared for industry-recognized external certification exams.

### Degrees:

Students graduating with an Associate in Science degree at CCSF with a major in Computer Networking and Information Technology (CNIT) may seek employment in entry-level network administration, computer technical support and web development positions.

The CNIT Major consists of completion of the core courses and 9-11 units of required courses from one of the option areas listed below:

- Computer Technical Support
- Internet and Web Development Techniques
- Network Security
- Wireless Networks
- Cisco Networking
- Microsoft Windows

### Transfer to Other Colleges and Universities:

Students who complete the two-year Associate in Science Degree program may choose to continue their education and earn a Bachelor's Degree. CCSF has transfer agreements with many of the California State University and University of California campuses. CNIT has a strong transfer agreement with students who want to transfer to the CSU Monterey Bay CSIT department.

### Admission:

Enrollment is open to all interested students. Please note that some classes have prerequisites, co-requisites and advisories.

Students who are interested in transferring after completion of the two-year degree program should discuss their a college counselor and a department program advisor to establish an education plan during the first semester of study.

### Certificates:

Certificates are a good choice for those who already have a degree in a different discipline, but want to gain credentials in an area of Computer Networking and Information Technology. The following certificates are currently offered:

- Computer Technical Support
- Computer Technician
- Fundamentals of Networking
- Fundamentals of Technical Support
- Network Security
- Routing and Switching (Cisco)
- Web Site Development Techniques
- Windows Networking
- Wireless Networking

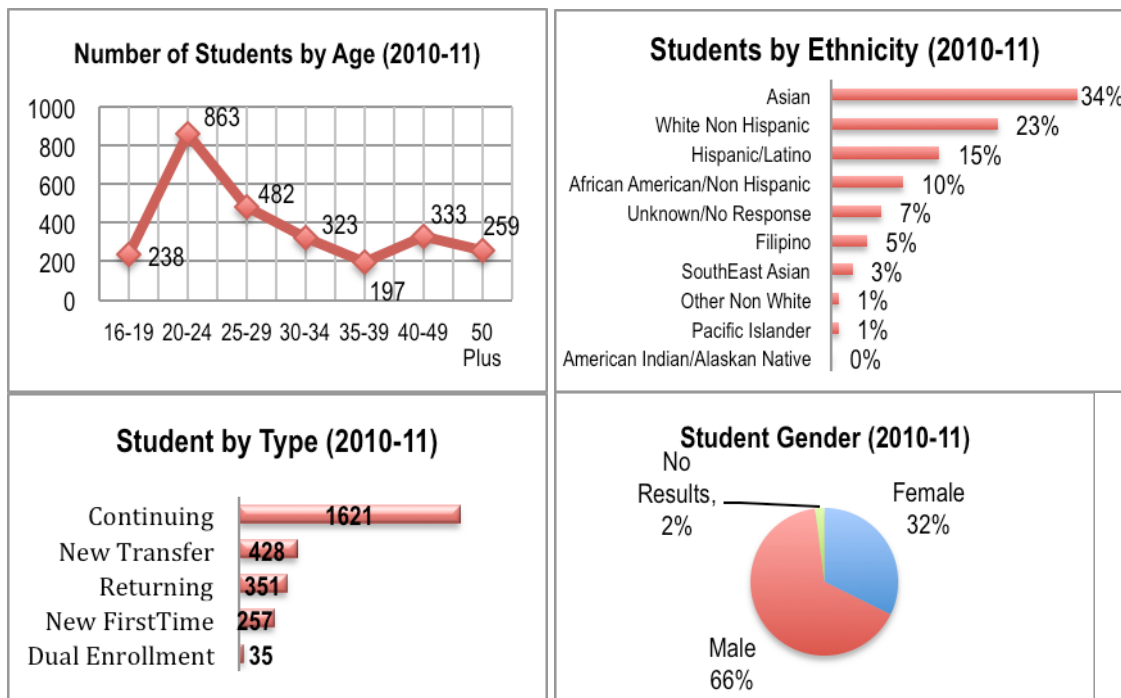
Industry certifications technology vendors such as Microsoft, Cisco, Oracle and Novell and by companies such as CompTIA are earned after successful completion of one or more standardized exams. Although CNIT courses prepare students to take industry certification exams, an industry certification is not earned until the successful completion of the exam at a testing center.

CNIT courses prepare students for the following industry certifications:

- CompTIA: (A+, Network+, Security+)
- Cisco: (CCNA)
- Microsoft: (MCTS and MCITP)
- Juniper Networks: (JNCIA)
- Ethical Hacking (CEH Certification)
- Certified Information Systems Security Professional (CISSP Certification)
- Hurricane Electric (IPV6 Certification)

**Student Demographics:**

Approximately 2,700 students a year enroll in a Computer Networking and Information Technology class at CCSF. In 2010-11, 10 percent of the 2,700 students who enrolled in CNIT classes were first-time students. Approximately 60 percent were younger than 30 years old. Sixty-five percent were men.





### **Certificates, Degrees and Transfers:**

- CNIT certificates and degrees awarded in 2010-11: 123
- CNIT students who transferred to a four-year school in 2011: 77

### **Internships:**

CNIT 197/198 internship and work-experience courses are available for supervised on- or off-campus work.

### **Employment and Income:**

Detailed information about the type of jobs and income expected in the Computer Networking and Information Technology field can be found on our Career and Technical Education Program FAQ web page: <http://goo.gl/136Uw>

### **Dual Enrollment Options:**

The following courses have been offered in past years to dual enrollment high-school students:

- CNIT 131: Internet basics and Beginning HTML
- CNIT 120: Network Security
- CNIT 106: Intro to Network

The CNIT Department is also working with Bay Area Video Coalition (BAVC) to establish a pathway/bridge program with a grant-funded cohort of students age 18-24 that begin their work at BAVC and then transition into a CCSF certificate, degree or transfer program.

**Number of high school students enrolled in CNIT classes in 2010-11: 35**

### **Faculty and Staff:**

Faculty: 20

Staff: 1

### **Computer labs:**

- Ocean Campus: Eight computer labs, including those with desktop computers, computers and parts for hardware classes, hardware and software for Cisco labs and an open lab area.

### **Campuses:**

Classes are taught on both the Mission and Ocean campuses. Online classes are also available.

### **Clubs and Organizations:**

- Web Design and Developer Student Group

### **For More Information contact:**

Department Chair and Student Advising: Carmen Lamha  
Computer Networking and Information Technology  
50 Phelan Avenue, Room S147

San Francisco, CA 94112  
Telephone: (415) 239-3396  
E-mail: [clamha@ccsf.edu](mailto:clamha@ccsf.edu)  
Web site: [www.ccsf.edu/CNIT](http://www.ccsf.edu/CNIT)

## Computer Science Department Fact Sheet

### Summary:

The Computer Science Department (CS) at CCSF offers courses in computer programming, databases, Unix/Linux administration and programming with multimedia. Students interested in transfer, an Associate in Science degree or a certificate program will find many options to choose from. The more than 60 CS courses range from entry-level, such as Introduction to Computer Science, to emerging technologies geared towards those looking for professional development, such as Android or iPhone programming.

### Degrees:

Graduates of the two-year program in Computer Science will have the skills in computer programming required for transfer to a four-year college or for employment as entry level or trainee positions in programming and quality assurance. Upon successful completion of the curriculum, students receive the Associate in Science (AS) degree in one of the following areas:

- Computer Science
- Computer and Information Science

### Transfer to Other Colleges and Universities:

Students who complete the two-year Associate in Science degree program are encouraged to continue their education and earn the Bachelor's degree. CCSF has transfer agreements with many of the California State Universities and University of California campuses.

### Admission:

Enrollment is recommended to students who have completed one year of high school algebra with a final grade of C or higher and one year of high school geometry with a final grade of C or higher, or equivalent.

Students who are interested in transferring after completion of the two-year degree program should discuss their plans with their program advisor or counselor.

### Certificates:

The certificate programs are designed to meet the needs of students who want 1) to obtain entry-level employment, 2) to increase their opportunities to advance in their current positions, or 3) to change the kind of work they do currently.

Certificates are a good choice for those who already have a degree in a different discipline, but want to gain credentials in CS.

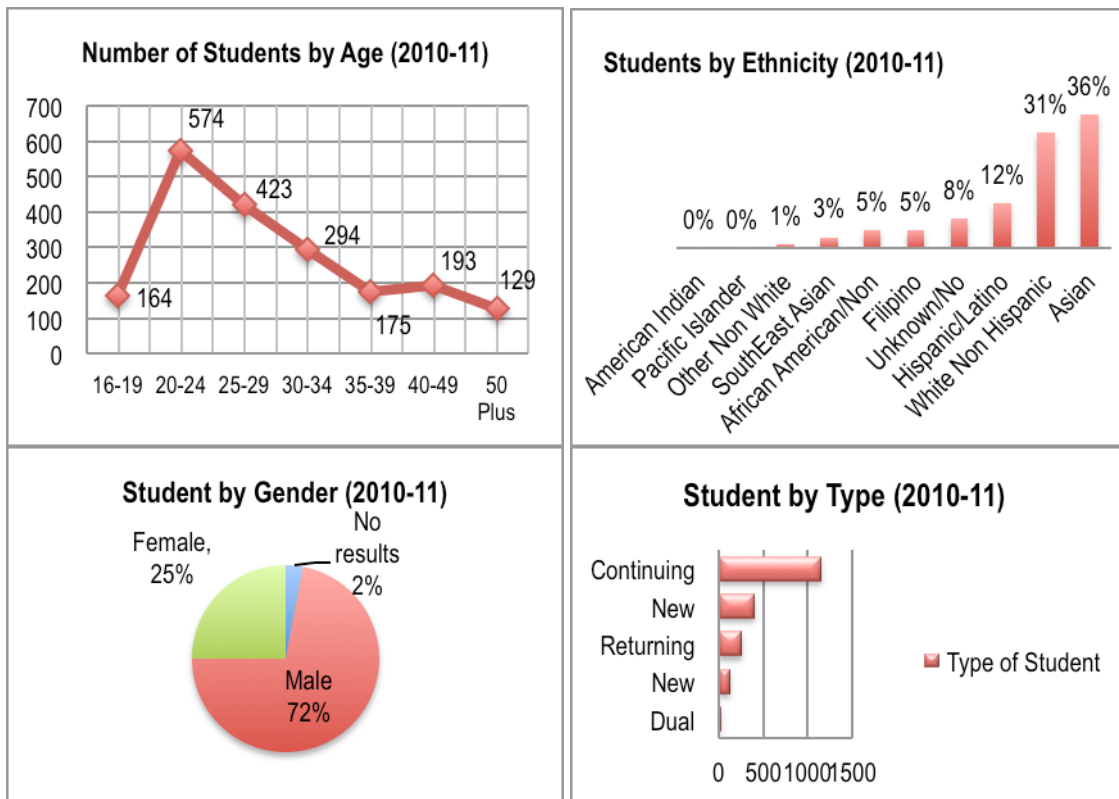
Certificate programs make it possible for a student to demonstrate specialization in areas such as computer programming, multimedia, LAMP and Unix administration. The following certificates are offered by the CS Department:

- Computer Programming: C++
- Computer Programming: Java
- Computer Programming: Visual Basic
- Computing Skills for Scientists
- Database Programming: MySQL/Open Technologies
- Database Programming: Oracle
- LAMP Administration

- LAMP Fundamentals
- Unix/Linux Administration
- Multimedia Programming

### Student Demographics:

Approximately 1,950 students a year enroll in a Computer Science class at CCSF. In 2010-11, approximately 6 percent of the students who enrolled in CS classes were first-time students. Approximately 60 percent were younger than 30 years old. Seventy-two percent were men.



### Certificates, Degrees and Transfers:

- Computer Science certificates and degrees awarded in 2010-11: 37
- Computer Science students who transferred to a four-year school in 2011: 81

### Employment and Income:

Detailed information about the type of jobs and income expected in the Computer Science field can be found on our Career and Technical Education Program FAQ web page: <http://goo.gl/I36Uw>

### Dual Enrollment Options:

Any introductory course is available for dual enrollment. The following courses have been offered in past years to dual enrollment high-school students:

- CS100: Introduction to Computer Science
- CS101: Introduction to Information Systems

- CS110A: Introduction to Programming: C++
- CS111A: Introduction to Programming: Java

The Computer Science Department is also working with Bay Area Video Coalition (BAVC) to establish a pathway/bridge program with a grant-funded cohort of students age 18-24 that begin their work at BAVC and then transition into a CCSF certificate or transfer program.

**Number of high school students enrolled in Computer Science classes in 2010-11: 26**

**Faculty, Staff and Facilities:**

Faculty: 16

Staff: 1

**Computer labs:**

- Ocean Campus: Two dedicated lab classrooms.
- Students can also use the Academic Computing Resource Center (ACRC), which has 130 PCs and 40 Macs for supporting students enrolled in computer science and other related Information and Communication Technologies (ICT) classes. The PCs use Windows XP Professional Operating System and have the following programs available for student use: Adobe Acrobat Reader X, Firefox 5.x, Cartes du Ciel – Sky Charts 2.76, Chrome, Easy Writer 3.02, Firefox, Fish Trek 1.0, the Geometer’s Sketchpad, Inspiration 6, JGrasp 1.8.6, Internet Explorer 9.x, JDK 1.6.7 and Real J (Java), McAfee VirusScan, MS Office 2007 and 2010 (including Access, Excel, Power Point, Publisher and Word), Logitech Quick Cam, MS Visio 2007, MS Visual Studio 2008 (Basic, C++, C), MS XML Notepad 2007, My IT Lab, Python 2.5, QuickTime 7.6.4, RealPlayer 11 and SSH Secure Shell Client 3.2.9.

The Macs use Mountain Lion and software includes, Adobe CS6, Apple Final Cut Pro, Apple iLife 11, Audacity, Firefox, iPhone SDK, MS Office 2011, QuickTime, Safari, SFTP Fugu and VLC Player 1.1.

**Campuses:**

Classes are taught on the Mission, Downtown and Ocean campuses. Online classes are also available.

**Clubs and Organizations:**

- Associated Students Linux Club

**For More Information contact:**

Department Chair and Student Advising:  
 Craig Persiko  
 Computer Science  
 50 Phelan Ave, Batmale 456  
 San Francisco, CA 94112  
 Telephone: (415) 239-3332  
 Email: [cpersiko@ccsf.edu](mailto:cpersiko@ccsf.edu)  
 Web site: [www.ccsf.edu/CS](http://www.ccsf.edu/CS)

## Graphics Communication Department Fact Sheet

### Summary:

The Graphic Communications Department and Multimedia Studies Program prepare students for transfer and entry-level employment, with an emphasis on graphic design, digital media, web design and development, production art, illustration, game design, digital and offset print production and Letterpress printing and book arts.

Students who are looking to upgrade or re-tool workplace skills will find 42 courses focused on skills for graphic designers, digital media specialists, illustrators, web designers, developers and producers, animators, interactive game designers, production artists and digital and offset printers.

### Degree:

The Graphic Design major was created to provide students with a strong foundation in the fundamental aspects of graphic design. Students develop creativity and ideation skills, learn the theories of communication design and apply this to a wide range of design situations. The program is hands-on, integrating conceptual design studies with traditional and digital tools and production methods.

### Transfer to Other Colleges and Universities:

Students who complete the two-year Associate in Arts degree program are encouraged to continue their education and earn the Bachelor's degree. CCSF has transfer agreements with many of the California State Universities and University of California campuses.

### Admission:

Enrollment is open to all interested students. Please note that some classes have prerequisites, co-requisites and advisories.

Students who are interested in transferring after completion of the two-year degree program should discuss their plans with a program advisor or counselor.

### Certificates:

Certificates are often a good choice for a student who already has a degree in a different discipline, but wants to gain credentials in areas of Graphic Communications and Multimedia Studies.

Beginning students will find that, for many fields, the classes also provide the skills and knowledge required for entry-level employment for those who don't have a degree already.

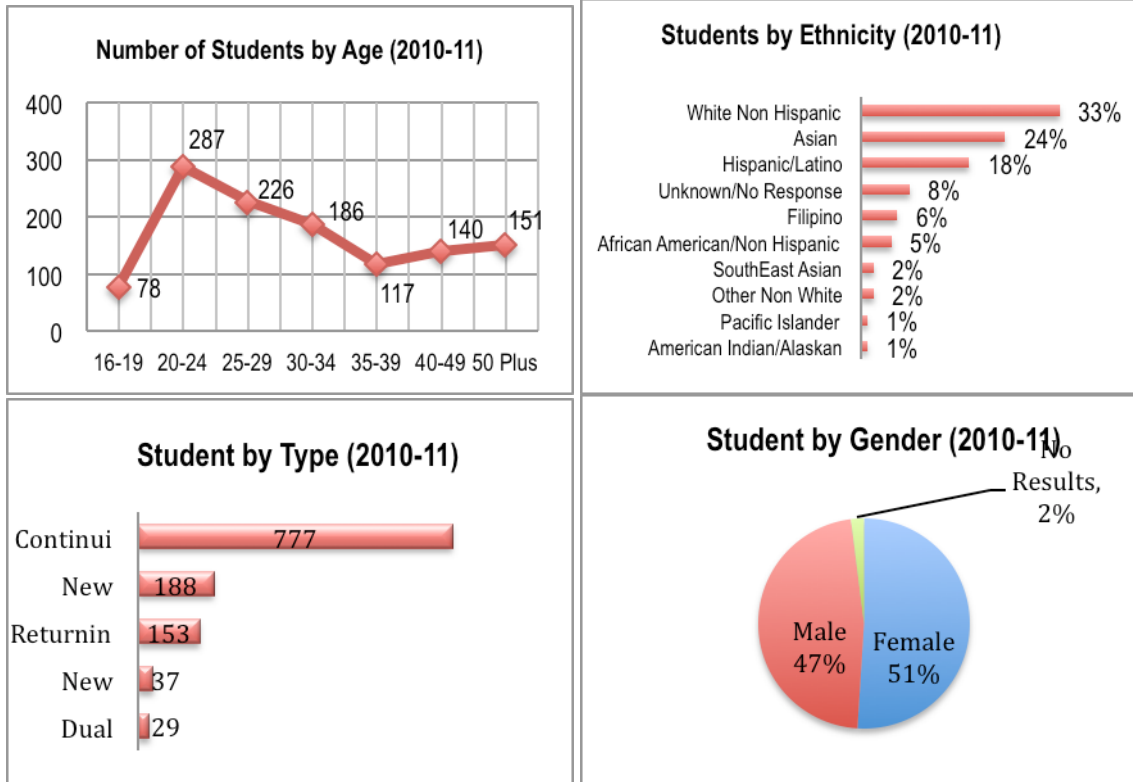
The following certificates are offered by the Graphic Communications Department:

- Animation
- Digital Illustration
- Digital Printing and Document Management
- Flash Design and Development
- Interactive Game Design and Production Certificate
- Performance Arts
- Production Arts
- Rich Media Production
- Web Design and Graphics

- Web Design with Dreamweaver
- Web Production (Fast Track)
- Web Programming
- Web Programming (Fast Track)

**Student Demographics:**

Approximately 1,250 students a year enroll in a Graphic Communications and Multimedia Studies classes at CCSF. In 2010-11, three percent of the students who enrolled in these classes were first-time students. Approximately half were younger than 30 years old. Fifty-one percent were women.



**Certificates, Degrees and Transfers:**

Graphic Communications & Multimedia Studies certificates and degrees awarded in 2010-11: 21  
 Graphic Communications students who transferred to a four-year school in 2011: 32

**Internships:**

GRPH 197 and MMSP 160 internship and work-experience courses are available for supervised on- and off-campus work.

**Employment and Income:**

Detailed information about the type of jobs and income expected in the Graphic Communications and Multimedia field can be found on our Career and Technical Education Program FAQ web page: <http://goo.gl/l36Uw>

**Dual Enrollment Options:**

Any introductory course is available for dual enrollment. The following courses have been offered in past years to dual enrollment high-school students:

- GRPH 25: Digital Skills for Visual Media
- GAME 100: Exploring Game Worlds
- MMSP 110/GRPH 23: Orientation to Graphics and Multimedia

The Graphics Communications Department is also working with Bay Area Video Coalition (BAVC) to establish a pathway/bridge program with a grant-funded cohort of students age 18-24 that begin their work at BAVC and then transition into a CCSF certificate or transfer program.

**Number of high school students enrolled in Graphic Communications and Multimedia classes in 2010-11: 29**

**Faculty, Staff and Facilities:**

Faculty: 29

Staff: 3

**Computer labs:**

- Ocean Campus: Four Macintosh computer lab classrooms and access to open labs
- Mission Campus: Three Macintosh computer lab classrooms and two printing technology labs.

**Campuses:**

Classes are taught on both the Mission and Ocean campuses. Online classes are also available.

A Peer Mentor program provides out of classroom support for students enrolled in production classes.

**Clubs and Organizations:**

- AIGA –The American Institute of Graphic Artists Student Chapter provides educational, networking and outreach opportunities.
- Those studying web design and production often join CNIT’s Web Design and Development Club.

**For More Information contact:**

Department Chair and Student Advising:

Smiley Curtis

Graphic Communications

50 Phelan Ave, Visual Arts 141

San Francisco, CA 94112

Telephone: (415) 452-9050

E-mail: [acurtis@ccsf.edu](mailto:acurtis@ccsf.edu)

Beth Cataldo, Coordinator

Multimedia Studies Program

50 Phelan Ave, Visual Arts 143A

Telephone: (415) 452-5107

E-mail: [bcataldo@ccsf.edu](mailto:bcataldo@ccsf.edu)

Web site: [www.ccsf.edu/Graphics](http://www.ccsf.edu/Graphics)



## Appendix 4: Overview of City College of San Francisco

City College of San Francisco (CCSF) is a public, two-year community college accredited by the Accrediting Commission for Community & Junior Colleges of the Western Association of Schools and Colleges. Since its founding in 1935, City College has evolved into a multicultural, multi-campus community college that is one of the largest in the country. CCSF offers courses in more than 50 academic programs and over 100 occupational disciplines. There is a full range of credit courses leading to the Associate of Arts and Science degrees, most of which meet the general education requirements for transfer to a four-year colleges and universities.

### Academic Life

Associate degrees are granted in academic programs such as Broadcasting, Business, Computer Science, Computer Networking and Information Technology, Culinary Arts, Engineering, Fashion, Graphic Communications, Health Care, Nursing, Physical Education and Dance, as well as Women's Studies. The College's Honors Program provides students an enhanced educational experience along with potential transfer and scholarship benefits. CCSF employs 815 full-time and 1,035 part-time faculty, 95 percent of whom have master's degrees and nearly 250 holding doctorates.

### Campus Life

The Student Activities Office provides resources, support and leadership training for eight Associated Students Councils and more than 80 clubs and student organizations. It sponsors a wide variety of concerts and lectures throughout the year. It funds the Book Loan Program, Dr. Betty Shabazz Family Resource Center, Multi-Cultural Resource Center, Queer Resource Center, Student Health, Students Supporting Students mentoring program, and Women's Resource Center.

Students can also use the Fitness Center, enjoy nationally ranked intercollegiate sports, and participate in the College's award-winning intercollegiate Speech and Debate Program. The College also features a student-run newspaper, The Guardsman, television and radio stations. Performances given by students in music, dance, and theatre Arts further enhance campus life.

### Facilities and Resources

Successful Bond initiatives have allowed City College to embark on construction of new campus facilities including the Mission and Chinatown/North Beach Campuses, the Community Health and Wellness Center, the Student Health Services Center, the Child Development, and the multi-use classroom building. The Performing Arts Center and an Advanced Technology Building are in the design phase.

City College has more than 70 computer labs with about 2100 computers comprising Windows PCs and Macs. Windows PCs and some Macintoshes are available to CCSF students who require Internet connectivity and Microsoft Office applications. Computers are available in the Academic Computing Resource Center (Batmale 301), and in the College's Louise and Claude Rosenberg, Jr., Library on the Ocean Campus, which features a Language Center, a Learning Assistance Center, and a Media Center.

### Athletics / Sports

Intercollegiate athletics are offered for men and women. College teams compete in the Coast Conference and with teams from other colleges. Intercollegiate sports include baseball, basketball, cross-country, football, soccer, softball, tennis, track, badminton, volleyball, and judo. City College of San Francisco Football Teams has won eight national championships.

**Financial Aid /Tuition**

In-state enrollment fees are affordable at City College. California residents pay \$46 per credit. Financial aid is available including grants, college work-study, and loans. Students may apply for these programs by filing a Free Application for Federal Student Aid. Nonresident tuition fee is an additional \$187 per credit. There is a \$17 health fee. Students who are California residents may apply for a Board of Governors Fee Waiver.

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## Appendix 5: Programs for High School Students at City College of San Francisco

City College offers a variety of programs for San Francisco high school students. An overview of the options and the steps to enroll are detailed in this document. The information here can also be found on the CCSF High School Programs web page ([www.ccsf.edu/hs](http://www.ccsf.edu/hs)) with links directly to the forms that students and parents need to fill out.

### Contents:

- Dual Enrollment
- Concurrent Enrollment
- Credit Recovery
- Cahsee
- The ESL Program
- Support for high school students matriculating into college

### Dual Enrollment

Students can enroll in college courses that are part of a their high school Academy/Pathway Program. Students will receive college credits, start their college transcript and learn more about the pathway or academy that they're studying in high school.

### Steps to Enroll

#### New Students must:

**Step 1:** Complete a [CCSF Application Online](#)

**Step 2:** Complete the following forms, which are linked to from the CCSF High School Programs web site:

• [Parent/Guardian Consent](#)

• [Principal/Designee Recommendation Form](#)

**Step 3:** Attend a mandatory Dual Enrollment orientation at the beginning of each semester.

#### Returning Students must:

**Step 1:** Re-apply to CCSF every school year.

**Step 2:** Complete the following forms, which are linked to from the CCSF High School Programs web site:

• [Parent/Guardian Consent](#)

• [Principal/Designee Recommendation Form](#)

**Step 3:** Attend a mandatory Dual Enrollment orientation at the beginning of each semester.

### Picking Classes:

**Step 1:** Students should pick three choices from the [Academy & Pathway Class Schedule](#), which is provided in the beginning of each semester in paper form or can be found on the CCSF High School Programs web site.

If students are enrolled in a career academy or pathway, they will be given priority in courses according to their high school pathway or career academy. CCSF suggests that students make their first choice a class that is listed under the name of their pathway/academy. Students may then choose other classes that interest them as their next choices.

**Step 2:** Students should put their choices on their [Principal/Designee Recommendation Form](#), which is available from the High School Programs web site.

**CCSF Contact Information:**

Academy/Pathway Counselor/Coordinator:

Valerie Abaunza

415-550-4422

[vabaunza@ccsf.edu](mailto:vabaunza@ccsf.edu)

Academy/Pathway Counselor:

Allison Martinez

415-550-4444

[amartinez@ccsf.edu](mailto:amartinez@ccsf.edu)

Academy/Pathway Support:

Connie Huang

415-676-9855

[conniehuang124@gmail.com](mailto:conniehuang124@gmail.com)

Dual Enrollment Director:

Suzanne Korey

415-550-4420

[skorey@ccsf.edu](mailto:skorey@ccsf.edu)

**Concurrent Enrollment**

High school or home-schooled students interested in academic classes being offered at City College of San Francisco can start taking college level courses to expand their knowledge and earn college credits.

High School students may enroll in any CCSF academic classes alongside other college students. Students should in mind that many courses have prerequisites and classes fill up quickly and may limit their choices. In order to qualify, students must be in in good academic standing with a minimum G.P.A. of 2.0 and 120 high school credits. The student's high school determines whether or not he/she will receive high school credit for taking college credit courses. English and Math courses require that students first take a CCSF placement test before they enroll in a course.

**Steps to Enroll**

**Step 1:** Complete a [CCSF Application Online](#)

**Step 2:** Complete the following forms, which are linked to from the CCSF High School Programs web site:

- [Parent/Guardian Consent](#)
- [Principal/Designee Recommendation Form](#)

**CCSF Contact Information:**

Office of Admissions and Records: 415-239-3286  
[hscroll@ccsf.edu](mailto:hscroll@ccsf.edu)  
CCSF Ocean Campus  
Conlan Hall – E107

**Credit Recovery**

If students are missing credits to graduate from high school, the High School Diploma Program through City College of San Francisco may be the best program for them to pursue. The Transitional Studies Department offers this program, where students can take math, literature and science courses designed specifically for high school students.

Students may earn high school credit, but not college credit. CCSF Credit Recovery is a way for high school students to get back on track for graduation, make up courses they didn't pass the first time around or recover missed credits/classes required for high school graduation. All classes are tuition free.

**How to Enroll**

**Step 1:** Students in San Francisco Unified School District may use the new online enrollment process found at: <http://ccsf.dualenroll.com>

or

To enroll in person, students should talk to their high school counselor.

Students will find the following forms, which are required to join this program, on the Credit Recovery section of the High School Programs web page:

- [Noncredit Online Admission Application](#)
- [Principal/Designee Recommendation Form](#)
- [Parent/Guardian Consent](#)

**Contact Information:**

Specific Information about Credit Recovery classes changes each semester. Student can find information on the CCSF web site at:

[http://www.ccsf.edu/NEW/en/future-students/future-academy\\_pathway-dual-enrollment-students/credit\\_recovery.html](http://www.ccsf.edu/NEW/en/future-students/future-academy_pathway-dual-enrollment-students/credit_recovery.html)

**CAHSEE**

The California High School Exit Exam (CAHSEE) is a requirement for high school graduation in the state of California. Students must pass the exam before they can receive a high school diploma, regardless of any other graduation requirements. If a student requires support to pass this exam, either in math or English, he/she can sign up for a CAHSEE prep course. CCSF offers CAHSEE preparation during the school year and the summer.

**Steps to Enroll**

To enroll in CAHSEE classes, students must complete NONCREDIT paperwork.

**Step 1:** Complete a [CCSF Application Online](#)

**Step 2:** Students will find the following forms, which are required to join this program, on the CAHSEE section of the High School Programs web page:

- [Parent Consent Form](#)
- [Principal Counselor Form](#)

**Contact Information:**

Specific Information about help with the CAHSEE Exam classes changes each semester. Please find information on the CCSF web site at:

[http://www.ccsf.edu/NEW/en/future-students/future-academy\\_pathway-dual-enrollment-students/cahsee.html](http://www.ccsf.edu/NEW/en/future-students/future-academy_pathway-dual-enrollment-students/cahsee.html)

Academy/Pathway Counselor  
Allison Martinez  
City College of San Francisco  
415-550-4444  
[amartinez@ccsf.edu](mailto:amartinez@ccsf.edu)

Family Outreach Coordinator  
Bay View Beacon  
415-469-4550, ext. 13223  
or 415-337-7991

**CCSF English as a Second Language (ESL) Programs:**

High school students who need better English speaking, reading and writing skills can take noncredit English as a Second Language (ESL) courses at CCSF.

The CCSF classes are tuition free and taught at five major campuses throughout San Francisco. Noncredit classes offer listening, speaking, reading and writing skill development from Literacy to Advanced Low English skills every day of the week and from 7am to 10pm.

There are general ESL classes, focused skill classes, intensive classes and computer-assisted language learning classes. Some career and technical training pathways start at the Low Beginning level.

CCSF's vocational ESL classes help students start a new career, gain a better position at work, or gain the ability to enter credit vocational certificate and technical training programs through special bridge classes.

Citizenship preparation and civic engagement classes encourage students to become informed, productive members of San Francisco Bay Area communities. Noncredit students can easily transition into the CCSF Credit ESL Program, having easy access to the matriculation process including a bridge Success in Credit class.

The CCSF High School Diploma program awards 5 elective credits for 90 hours of Noncredit ESL.

**How to Enroll:**

**Step 1:** Choose a campus that is convenient for taking classes.

Noncredit classes are offered at:  
Civic Center Campus: 561-1020  
John Adams Campus: 561-1835  
Chinatown/North Beach Campus: 561-1017  
Downtown Campus: 267-6543  
Mission Campus: 550-4430  
Southeast Campus: 550-4344

**Step 2:** Take a placement test. Students should call the campus they are interested in or go in person to get an appointment for a placement test. Placement tests are offered at various times throughout the semester.

**Step 3:** Counseling and Registration. After the placement test, students should set up an appointment with a counselor to discuss the classes they want and the times they can study. The counselor will register students into a class (or classes) and tell them exactly when and where to go.

For more information about the noncredit program, students should call the campus where they are interested in taking classes. Or they may contact the ESL Department office at 239-3003.

**Matriculating Into College After High School:**

The CCSF Credit Division offers an extensive array of subjects in both credit and non-credit programs in numerous locations, and Dual Enrollment students can continue at CCSF after high school graduation.

**How to Enroll:**

**Step 1:** Complete a [CCSF Application Online](#)

**Step 2:** Take a placement test. Placement Tests in ENGLISH or ESL (English as a Second Language) and MATH are given regularly from October through January and mid March through August. Seating is limited for certain English and Math Placement tests. To schedule an appointment for an English and Math placement test, go to <http://esars.ccsf.edu/>.

**Step 3:** Attend a New Student Orientation. New matriculants are required to participate in an Orientation to City College. The orientation introduces you to some of the essential programs, services and procedures at the College. There are two ways that students can achieve this:

1. Participate in an [online orientation by clicking going to the web site:](http://www.ccsf.edu/Offices/Matriculation/Orientation/)

Students in special programs such as International Students, EOPS, concurrent High School, and certain vocational programs (e.g. Culinary Arts and Hospitality, Nursing, Allied Health, Pathways to ICT Education and Careers in San Francisco

Aeronautics, etc.) are required to attend special orientations targeted to those specific programs. Please contact those departments for more information.

OR

2. Attend an in-person, one-hour orientation after picking up your placement test results. The date and time for orientation will be given during the testing session, and are listed on the Native English and ESL (English as a Second Language) [testing schedules](#).

**Step 4: Meet with a Counselor.** Students meet with a New Student counselor after completing the online or in-person Orientation to CCSF. Students will briefly review their educational background and goals and the placement results with the counselor and select their first semester classes. If they are in a special program (e.g. International Students), they will need to see the counselor assigned to that program.

This is only an initial meeting with the counselor. Students are encouraged to schedule a one-hour educational planning appointment with the counselor during their first or second semester to discuss their academic goal and begin planning their required courses to reach this goal. Career counselors are also available to assist students in identifying career interests and goals.

**Step 5: Register for Classes.** When students have finished Steps One through Four, they can use the registration appointment given to them when they submitted their admission application once they turn in the completed Matriculation component card and Initial Interview Form to the Admissions and Records Office.

The Registration appointment will tell students the earliest date and time that they can register for their classes online or in-person. New and re-admitted students must have a registration appointment in order to register for classes. Students may register online, through WEB4 by logging in using their student ID and PIN#.

**Contact Information:**

Placement Testing Office  
Conlan Hall Room 203  
50 Phelan Ave  
San Francisco, CA 94112  
Phone: (415) 239 - 3124

Matriculation Office  
Conlan Hall Room 204  
50 Phelan Ave  
San Francisco, CA 94112  
Phone: (415) 239 - 3751  
Fax: (415) 452 - 5127

Registration Office  
50 Phelan Ave  
Smith Hall Room 118  
San Francisco, CA 94112  
Phone: (415) 239-3732.



Email: [register@ccsf.edu](mailto:register@ccsf.edu)

Admissions and Records  
50 Phelan Ave  
Conlan Hall Room 107  
San Francisco, CA 94112  
Tel: (415) 239-3285  
Fax: (415) 239-3936  
Email: [admit@ccsf.edu](mailto:admit@ccsf.edu)

The following is a list of programs that help students succeed once they enroll in classes.

### **Guardian Scholars**

The Guardian Scholars Program is committed to helping students exiting the foster care system by providing comprehensive support program to help you complete a GED, achieve an A.A. degree, complete a certificate program or transfer to a four year college.

### **AB540**

AB540 is a state law that exempts certain students who are not residents of California from paying nonresident tuition at California Community Colleges and California State Universities. The current CCSF residency rate is \$46 per unit. Find out if you qualify.

### **Disabled Students Programs and Services**

If you are a student with a disability, your involvement with the Disabled Student Programs and Services (DSPS) can be thought of as a partnership between you and the Disabled Students Programs and Services staff. Find out if this program is right for you.

### **Gateway to College**

The program gives students the opportunity to earn a high school diploma while earning college credits and achieving college success. Students simultaneously accumulate high school and college credits, earning their high school diploma while progressing toward an associate degree or certificate.

### **Contact Information:**

Admissions and Records Office  
Conlan Hall Room 107  
50 Phelan Ave  
San Francisco, CA 94112  
415-239-3285

Matriculation Office  
Conlan Hall Room 204  
50 Phelan Ave  
San Francisco, CA 94112  
415-239-3751

Office of Outreach and Recruitment  
Multi Use Building Room 130A  
50 Phelan Ave

San Francisco, CA 94112  
415-239-3556

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## Appendix 6: Catalog Descriptions of ICT Classes by Department

### Business Department

#### **MABS 25. Keyboarding (1)**

Lab-5 (8 wks) P/NP Available

Development of keyboard control; accuracy, speed, and concentration exercises; equipment operation and care. Completion requirement: Ability to type by the touch method, 25 words a minute gross in a series of three-minute tests with an average of not more than one error per minute. CSU

#### **MABS 30. Computer Keyboarding (3)**

Lec-3, lab-3 P/NP Available

*ADVISE: ENGL 90 or ESL 140*

Beginning computer keyboarding and desktop computing essentials. Students learn to keyboard by touch, use the 10-key numeric keypad, and apply these skills to professional computer applications. Proper technique is stressed to enhance speed and accuracy. Includes computer hardware and software concepts, ergonomics, word processing, and using Internet Explorer for office tasks. CSU

#### **MABS 35. Speedbuilding: Keyboarding (1)**

Lab-5 (8 wks.) P/NP Available

*PREREQ.: MABS 25 , MABS 30, or WDPR 78 or the ability to type 25 words a minute for 3 minutes with no more than 3 errors.*

*Repeat: max. 4 units*

A review of good typing techniques, manipulation of machine parts, and keyreaches. Emphasis on the development of speed and control. CSU

#### **MABS 38. Keyboarding with Microsoft Word (3)**

Lec-3, lab-3

*PREREQ.: MABS 35 or WDPR 79 or the ability to type 35 words a minute with no more than one error a minute. ADVISE: ENGL 90 or ESL 72 or 150 or placement in ENGL 92 or ESL 82 or 160.*

Entering, formatting, proofreading, and revising business documents such as letters, single and multi-page reports, outlines, tables, minutes, and resumés to an acceptable office standard using a word processing system. Students also interpret proofreading marks, compose brief office messages, and continue to enhance their keyboarding skills. CSU

*Not open to students who have completed WDPR 80.*

#### **MABS 40. Internet Explorer and Outlook Email (3)**

Lec-3, lab-3 P/NP Available

*ADVISE: ENGL 90 or ESL 140.*

Use of Internet Explorer to find solutions for common business tasks, and the use of Microsoft Outlook to send and receive e-mails, set up contact lists, maintain a calendar, create appointments, schedule meetings, and more. Efficient search techniques are stressed. Also covered are computer hardware basics and Windows file management. CSU

#### **MABS 60. Introduction to Computer Applications for Business (3)**

Lec-3, lab-3 P/NP Available

*ADVISE: MABS 25 or MABS 30.*

Introduction to the concepts and skills of using personal computers for business. Includes fundamental concepts of hardware, the operating system, and the five most frequently used office applications: word processing, electronic spreadsheet, database management, web browser, and email. UC/CSU

#### **MABS 61. Advanced Microsoft Office for Windows (3)**

*Pathways to ICT Education and Careers in San Francisco*

Lec-3, lab-3 P/NP Available

**PREREQ.:** MABS 60 OR DEMONSTRATION OF MABS 61 EXIT SKILLS.

Creating spreadsheet, database, word processing, and presentation projects using advanced features in Microsoft Office. Preparing documents for the World Wide Web by utilizing Office's built-in tools. CSU

**MABS 67. Database for Business/Access for Windows (3)**

Lec-3, lab-3 P/NP Available

**ADVISE:** MABS 25.

Introduction to a relational dynamic database environment using Access for Windows. Experience creating and modifying business databases; data manipulation and retrieval, and report generation. CSU

**MABS 88. Microcomputer Applications Laboratory (hrs)**

Lab-10

**COREQ:** Any Business Department credit or noncredit class

An open laboratory for students who are completing homework assignments for Business Department credit and noncredit classes. Enroll in the lab. CSU

**MABS 90. iPad for Business (1)**

Lec-3, field trips P/NP Available

Introduction to the concepts and skills of using an iPad for business. Topics include using built-in tools such as Safari and Mail; Apple apps such as Pages, Keynote and Numbers; third-party apps such as Office apps, PDF management apps and clouds computing services. CSU

**MABS 101. Spreadsheets for Business/Excel (3)**

Lec-3, lab-3 P/NP Available

**ADVISE:** MABS 25 or ability to type 25 wpm; BSMA 66 or 68.

Experience in creating, modifying, and printing spreadsheets using Excel software on either IBM-PC compatible or Macintosh computers. Includes creating charts, working with database features, and the use of macros. CSU

**MABS 160. Survey of Business Data Processing (3)**

Lec-3, lab-0.5

An introduction for business students stressing the principles, terminology, and programming of a business data processing system. The concepts of a management information system, its uses, limitations, and impact on organizations reviewed. An introduction to the programming language BASIC is given by the entering and testing of business problem using computers. CSU

**MABS 202. PowerPoint Presentations (3)**

Lec-3, lab-3 P/NP Available

**ADVISE:** MABS 25.

Creating business presentations using Microsoft PowerPoint. Topics include planning an effective presentation, developing on-screen slides; inserting tables, pictures, charts and diagrams into slides; and constructing a slide show utilizing animation, transitions, sound, and timings. The design of master slides and templates is also covered. CSU

**MABS 301. Novell Network Administration (2)**

Lec-2

Basic and fundamental network management tasks are covered in lecture and hands-on lab assignments using a Novell Local Area Network. Includes user support, directory structures, security, backups, menus, mail, and use of file server and workstation utilities. Prepares students to take the Certified Novell Administrator examination. CSU

**MABS 302. Novell Administration: Advanced (1)**

Lec-1

Advanced network management concepts and tasks using a Novell Local Area Network including: server configuration, management, and maintenance; performance monitoring; accounting; advanced services; network configuration to support other protocols (e.g., TCP/IP and Mac). Prepares to take the Certified Novell examination for this subject. CSU

*Not open to students who have completed MABS 302*

**MABS 391. Word Processing/Microsoft Word (3)**

Lec-3, lab-3 P/NP Available

*PREREQ.: MABS 35 or the ability to type at least 35 words a minute with no more than one error a minute.*

*ADVISE: ESL 150 or placement in ESL 82 or 160.*

Experience creating, formatting, editing, and printing documents on the IBM personal or compatible computer using Word for Windows. Features covered include the spelling and grammar checkers, page numbering, and tables. Advanced features include headers and footers, footnotes, merge features, macros (automatic keystroke repetition), style sheets, newspaper and parallel columns, sorting, and other features as time permits. CSU

*Not open to students who are enrolled in or have completed WDPR 391, 391A or 391B.*

**MABS 405. Developing Web Sites - FrontPage (3)**

LEC-3, lab-3 P/NP Available

*ADVISE: MABS 60 (knowledge of Microsoft Windows and Microsoft Office)*

Practical instruction in designing and publishing business web pages on the Internet using Microsoft FrontPage. Web sites will include: page division with frames, interactive input forms, tables, hyperlinks, graphics, animated images and multimedia. Exploration of how an enterprise might plan, design, produce, promote, and maintain a business web site. CSU

**MABS 406. Developing Web Sites-Dreamweaver (3)**

Lec-3, lab-3 P/NP Available

*ADVISE: MABS 60*

Designing and publishing business web pages on the Internet using Macromedia Dreamweaver. Web sites will include page division with frames, interactive input forms, tables, hyperlinks, graphics, animated images and multimedia. The course will explore how an enterprise might plan, design, produce, promote, and maintain a business web site. CSU

**MABS 407. Developing Web Sites-Expression Web (3)**

Lec-3, lab-3 P/NP Available

*ADVISE: MABS 60.*

Introduction to creating and maintaining business web pages using Microsoft Expression Web. Includes working with hyperlinks, tables, forms, graphics, and sound. Efficient production methods using style sheets and dynamic web templates are covered. Includes publishing a web site to a server computer connected to the Internet CSU

*Design and create your own business website using Microsoft Expression Web.*

## Broadcast Electronic Media Arts Department

**BCST 100. Introduction to Electronic Media (3)**

Lec-3

*ADVISE: ENGL 93 or 94 or placement in ENGL 96*

Development and impact of electronic media institutions of radio, television, cable, satellite, internet, and new media technologies as social, vocational, economic, and political forces in American society. The emphasis of this course is on history, organization, operation, occupation, programming, political development, regulation, and business practices. CSU

**BCST 101. Media Literacy (3)**

Lec-3

*ADVISE: SPCH 1A or 11*

Critical analysis of structure, economics, aesthetics, language, and technical aspects of radio, television, cable, and satellite programming. Methods of interpreting the visual and oral messages present in news, entertainment, and advertising. Impact of emerging technologies on program content and form. CSU

**BCST 102. New Media: Navigating the Information Age (3)**

Lec-3

Survey of new electronic media such as interactive teleconferencing and videoconferencing, direct broadcast satellite, digital radio and television, interactive television, desktop audio and video production, virtual news sets, holographic sportscasts, webcasting, computer-based broadcast news production, multimedia, digital cable, and wireless systems. Application of communication theories and research using technological, historical, social, and political perspectives. Impact of emerging communication technologies on broadcast electronic media. CSU

**BCST 103. Mass Media and Society (3)**

Lec-3

A general interest course covering the history, organization and social role of major mass communication media, such as radio, television, motion pictures, print, recording industries, multimedia, the Internet, and the World Wide Web. Basic theory of communication and communication research. Emphasis on the influence of mass media on the individual and society. UC/CSU

**BCST 104. Race and Media (3)**

Lec-3, field trips

*ADVISE: ENGL 93 or 94 or placement in ENGL 96*

A historical study of the image of African Americans, Asians, Hispanics, and other racial groups as projected through the mass media of print, film, radio, television, and recorded music. Ways in which the affected groups have responded to these images through general and ethnic media outlets. UC/CSU

**BCST 105. Gender and Mass Media (3)**

Lec-3

An exploration of the mass mediated messages -- radio, television, film, print, and the Internet -- and how they influence and define gender roles, with particular emphasis on how women are represented. A critique of roles given to each gender. An update on opportunities for women in each of the mainstream and alternative media industries. CSU

**BCST 106. Queer TV: Television and Lesbian and Gay Identity (3)**

Lec-3 P/NP Available

Examination of how gays, lesbians, bisexuals, and transgendered people are represented in and by the mainstream electronic media with strong emphasis on television. CSU

**BCST 109. Broadcast Production Laboratory ( hrs)**

Lab-8 P/NP Only

*COREQ.: BCST 110, 113, 117, 119, 120, 124, 125, 126, 127, 130, 131, 132, 133, 140, 142, 143, 144, 145, 147, 148, 149, or 150*

Supervised radio, audio, video, television, news, and sound recording production facilities and equipment for students to complete broadcast production assignments given in broadcast electronic media arts production classes. CSU

**BCST 110. Writing for Broadcast Electronic Media (3)**

Lec-3

Techniques of non-dramatic writing for electronic media including television, radio, cable, satellite, and webcast. Critique of professional and student scripts including commercials, news, public service announcements, infomercials, news services, and information providers. CSU

**BCST 112. Investigative Reporting for Broadcast Electronic Media (3)**

*Pathways to ICT Education and Careers in San Francisco*

Lec-3

*PREREQ.: BCST 110*

Investigative techniques used in radio television, cable, and webcast news. Research methods, interviewing methods, reporting techniques, story development techniques, story analysis, and writing methods for electronic media news. Introduction to digital media news gathering skills and news equipment, World Wide Web news gathering, and electronic news reporting by world media services and organizations. CSU

**BCST 113. Broadcast Journalism (3)**

Lec-3, lab-3

*PREREQ.: BCST 110 and 115*

*Repeat: max. 6 units*

Writing, announcing, producing, packaging, and evaluating radio, television, cable, and satellite news. An examination of news formats, news judgment, social impact, and broadcast news ethics. Impact of emerging technologies on broadcast news. CSU

**BCST 115. Announcing and Performance (3)**

Lec-3

*ADVISE: BCST 120*

Introduction to interpretation of copy, pronunciation, and announcer's duties for radio, television, cable, and webcast. Practical experience announcing commercials, news, public service, and other kinds of programs. Performance skills are developed through regular use of audio and video facilities and equipment. CSU

**BCST 117. Sports Announcing and Production (3)**

Lec-3, lab-3

*PREREQ.: BCST 115 AND 131 OR 140 OR EQUIVALENT SKILLS*

*Repeat: max. 6 units*

All aspects of sports announcing and production for radio, television, cable, satellite, and the Internet. An exploration of sports coverage history, issues, technology, production, play-by-play announcing, color announcing, and career opportunities. Students will announce and produce live and live-on-tape broadcasts of City College sports events. CSU

**BCST 119. Digital Media Skills (3)**

Lec-2, conf-1, lab-1

A hands-on overview of computer operations, industry standard software, equipment common to digital video and audio production, media storage and manipulation of audio and video media within the digital realm. Introduction to issues and the impact of new technology in the sound recording, video, multimedia, television, radio and film industries. CSU

**BCST 120. Audio Production (3)**

Lec-3, lab-4

Theory of sound, recording techniques and operation of audio production equipment. Theoretical and aesthetic aspects of sound, acoustics, audio signal flow, sound recording, mixing, sound for video, television, internet and live sound reinforcement. Proper use of microphones, recorders, digital audio workstations, audio consoles, and other common audio production equipment. CSU

**BCST 124. Digital Audio Production (3)**

Lec-3, lab-3

*PREREQ.: BCST 120 and BCST 119 or demonstration of their exit skills.*

*Repeat: max. 6 units*

Introduction to the history, theory and practice of basic digital audio production. This course prepares the student for advanced study in audio post production, music recording, internet content and game audio. Overview of industry standard digital audio software and hardware. CSU

**BCST 125. Sound Recording Studio (4)**

Lec-3, lab-6

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*PREREQ.: BCST 120. ADVISE: BCST 124*

*Repeat: max. 8 units*

This course covers the analog and digital multi-track techniques used in the various stages of professional sound recording as well as the workflow and etiquette required in a professional studio environment. The processes of acquiring basic tracks, overdubbing, editing, mixing and mastering will be examined. CSU

**BCST 126. Sound for Visual Media (3)**

Lec-3, lab-3, field trips

*PREREQ.: BCST 120 and 124 (may be taken concurrently). ADVISE: BCST 140 or 145 or equivalent skills*

*Repeat: max. 6 units*

Hands-on overview and theory of the processes, craft skills, and equipment used to apply sound to picture. Examines the stages of location sound production, dialog recording, sound editorial, sound design, Foley, music and mixing techniques for television, Internet, games and emerging media. CSU

**BCST 127. Advanced Sound Recording (3)**

Lec-3, lab-3, field trips

*PREREQ.: BCST 124 and BCST 125*

*Repeat: max. 6 units*

Theory and project-intensive course examining and using skills required for mixing and mastering audio. Students produce complex music production and sound-for-visual-media projects and examine digital and analog mixing techniques for various current and emerging media. CSU

**BCST 128. Sound Reinforcement (3)**

Lec-3, lab-3, field trips

*PREREQ.: BCST 120*

*Repeat: max. 9 units*

Live sound history, theory, technology, and craft skills with an emphasis on skill and the technical manipulation of sound in acoustic spaces. Includes hands-on live sound production and operations for nightclubs, theaters, large-scale concert venues, and distributed sound systems. CSU

**BCST 130. Radio News & Public Affairs (3)**

Lec-2, lab-5

*PREREQ.: Completion/concurrent enrollment in BCST 110. ADVISORY: BCST 100*

*Repeat: max. 6 units*

Practical experience in researching and writing on-air copy for news, public affairs, and promotions. Introduction to specific digital technology created for radio. Composition and development of digitized audio news packages. Web search of story content; developing news beat assignments and sourcing interviews for radio stories. Comprehension of when, why, and how music and sound would enhance or detract from a news package. Students will write all aired content for KCSF 90.9 caFM, City College of San Francisco's student managed and student staffed radio station. CSU

**BCST 131. Radio Production and Performance (3)**

Lec-2, lab-5, field trips

*PREREQ.: BCST 120. ADVISORY: BCST 115*

*Repeat: max. 6 units*

Practical experience in radio production work and on-air announcing. Students serve as announcers, news reporters, on-air personalities, and air board operators for City College of San Francisco's closed circuit AM and cable FM radio station KCSF. CSU

**BCST 132. Radio Management Skills (4)**

Lec-2, lab-8

*ADVISE: BCST 130 and 131*

*Repeat: max. 8 units*

Practical experience managing individuals and small groups within a non-commercial and commercial radio station. A laboratory experience for understanding the dynamics of motivating people to perform  
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creatively and skillfully within the skill sets required of a radio management team. Performance of key tasks which operate a digital radio system; supervising the programming and scheduling of radio station formats. CSU

**BCST 133. Digital Radio Programming (3)**

Lec-3, lab-1, field trips P/NP Available

*ADVISE: BCST 119*

*Repeat: max. 6 units*

Students will program and operate radio music, radio production, promotional spots, and radio scheduling databases for both live and automated radio presentation using industry standard software and systems. CSU

*LIVE ON-AIR AND AUTOMATED DIGITAL RADIO PROGRAMMING.*

**BCST 135. Audio for the Web (1)**

Lec-12, lab-12 (total hrs)

*PREREQ.: Completion of or concurrent enrollment in BCST 119 ADVISE: BCST 120*

*Repeat: max. 3 units*

A hands-on class focusing on technical considerations and content issues required to produce and deliver audio over the web. History of audio on the web and its impact on traditional broadcast media. CSU

**BCST 136. Video for the web (1)**

Lec-12, lab 12 total hrs

*PREREQ.: BCST 135 ADVISE: BCST 145*

*Repeat: max. 3 units*

A hands-on class focusing on technical considerations and content issues required to produce and deliver video content over the Internet. History of video delivery technology and its impact on traditional broadcast media. CSU

**BCST 140. Studio Video Production (3)**

Lec-2, lab-4

Theory and operation of video production equipment and facilities. Video production planning and organization; concept development, and production management. Instruction in camera, audio, lighting, live switching, server operation as well as above-the-line roles such as writer, director, producer, etc. Students acquire knowledge and skills by creating studio-based video programming. CSU

**BCST 142. Television Studio Operations (3)**

Lec-2, lab-4

A basic introduction to video production facilities, equipment, and operations for advanced students in advertising, architecture, design and illustration, electronic engineering, film production, journalism, multimedia, graphic communications, and theatre arts. CSU

**BCST 143. Digital Video Editing (3)**

Lec-3, lab-3

*PREREQ.: BCST 140 or 145 or FILM 24, plus BCST 119, IDST 120 or CIS 100M or demonstration of their edit skills.*

*Repeat: max. 6 units*

Digital video editing for video and film projects using industry standard AVID Xpress and Media Composer software on a Macintosh platform. Organizing the video edit, routing a networked video signal, digitizing video signal, creating the EDL, editing theory, editing principles, editing aesthetics, titling and 2D/3D effects, and output of final product from network to videotape. Students complete several short video-editing projects. CSU

**BCST 144. Digital Video Editing-Final Cut Pro (3)**

Lec-3, lab-3

*PREREQ.: BCST 140 or FILM 24, plus BCST 119, MMSP 120 or CS 100M or demonstration of their exit skills*

An introduction to digital video editing for TV, video, and multimedia projects using Apple Final Cut Pro on an Apple computer system. Using leading industry software students of this class focus on the operation, technology, techniques, and aesthetic process of editing video content with related title and visual effects components. CSU

**BCST 145. Field Video Production (3)**

Lec-3, lab-3

*Repeat: max. 6 units*

Aesthetic and technical elements of video field production, with emphasis on concept development, pre-production, production, and post-production. Students collaborate to create video packages for air on San Francisco's Educational Access cable channels and assist with productions for clients of the College's Broadcast Media Services video production unit. CSU

**BCST 146. Digital Video Effects (3)**

Lec-3, lab-3

*PREREQ.: BCST 119 or MMSP 120 or GRPH 25; and BCST 143 or 144 or GRPH 98A or 100A or FILM 56 or PHOT 57 or 60A*

*Repeat: max. 6 units*

Hands-on course for creating digital effects for broadcast, cablecast, webcast and distribution on mobile devices by applying video motion graphics and compositing techniques using both software and hardware-based methodologies. Effects are conceived, created and integrated with video projects in studio and laboratory settings. CSU

**BCST 147. Advanced Digital Video Editing (3)**

Lec-3, lab-3

*PREREQ.: BCST 143 or BCST 144 or CINE 56*

*Repeat: max. 6 units*

An advanced video-editing course that builds on prior introductory classes. The focus is on understanding and practicing video editing processes and techniques across a variety of TV and video genres as well as to gain a solid understanding of current video technology as related to processes, formats, visual effects and hardware. CSU

**BCST 148. HD TV Studio Production (3)**

Lec-3, lab-6, field trips

*PREREQ.: BCST 140 and completion/concurrent enrollment in BCST 119 ADVISE: BCST 110, 115, 126, 143; and BCST 144 or 145*

*Repeat: max. 6 units*

Aesthetic and technical elements of studio television production with emphasis on program development. Students collaborate to design, write and produce programming using contemporary broadcast studio standards and technology for cablecast on San Francisco's Educational Access Cable Channel 27, 75, and distribution on the internet. CSU

**BCST 149. HD TV Field Production (3)**

Lec-3, lab-6, field trips

*PREREQ.: BCST 145 and completion/concurrent enrollment in BCST 119 ADVISE: BCST 110, 126, 140; and BCST 143 or 144*

*Repeat: max. 6 units*

Advanced Aesthetic and technical elements of digital video field production. Students write and produce digital video packages from concept through post-production, and collaborate in teams to create professional quality digital video packages and segments for cablecast on Educational Access Television Channel 27, 75, and distribution on the internet. CSU

**BCST 150. Special Projects (2)**

*Pathways to ICT Education and Careers in San Francisco*

Conf-1, lab-2, work-3, field trips P/NP Available

*Repeat: max. 6 units*

Work on electronic media communications project acceptable to both the student and the instructor. Only a project having significant value in the field of broadcast electronic media arts will be approved. CSU  
*Instructor's permission required to add.*

**BCST 155. Selected Topics in BEMA (1)**

Lec-1 P/NP Available

*Repeat: if no subject repeat*

Selected topics in Broadcast Electronic Media Arts are explored through lectures, discussions, seminars, industry panels, media conferences, satellite downlinks, teleconferences, workshops, film, video, and/or television leading to a critical analysis and understanding of the topic under examination. CSU

**BCST 156. Selected Topics in BEMA (2)**

Lec-2 P/NP Available

*Repeat: if no subject repeat*

Selected topics in Broadcast Electronic Media Arts are explored through lectures, discussions, seminars, industry panels, media conferences, satellite downlinks, teleconferences, workshops, film, video, and/or television leading to a critical analysis and understanding of the topic under examination. CSU

**BCST 157. Selected Topics for BEMA (3)**

Lec-3 P/NP Available

*Repeat: if no subject repeat*

Selected topics in Broadcast Electronic Media Arts are explored through lectures, discussions, seminars, industry panels, media conferences, satellite downlinks, teleconferences, workshops, film, video, and/or television leading to a critical analysis and understanding of the topic under examination. CSU

**BCST 160A. College Internship (2)**

Lec-1, conf-.5, lab-8 P/NP Available

*COREQ: Enrollment in minimum of 7 units of course work (including this course) and consent of instructor*

On-campus college internship in an approved media related installation within the college such as Broadcast Media Services, Educational Access Television, KCSF Radio, and the Public Information Office. Resumé writing, communication skills, and job interview techniques. CSU

**BCST 160B. College Internship (2)**

Lec-1, conf-.5, lab-8 P/NP Available

*COREQ: Enrollment in minimum of 7 units of course work (including this course) and consent of instructor*

On-campus college internship in an approved media related installation within the college such as Broadcast Media Services, Educational Access Television, KCSF Radio, and the Public Information Office. Resumé writing, communication skills, and job interview techniques. CSU

**BCST 160C. College Internship (2)**

Lec-1, conf-.5, lab-8 P/NP Available

*COREQ: Enrollment in minimum of 7 units of course work (including this course) and consent of instructor*

On-campus college internship in an approved media related installation within the college such as Broadcast Media Services, Educational Access Television, KCSF Radio, and the Public Information Office. Resumé writing, communication skills, and job interview techniques. CSU

**BCST 165A. Industry Internship (2)**

Lec-1, conf-.5, Work 8 hrs P/NP Available

*COREQ: Enrollment in minimum of 7 units of course work (including this course) and consent of instructor*

*Repeat: max. 4 units*

Observation and supervised off-campus experience in an approved broadcast electronic media industry installation such as a television station, a video production firm, a radio station, a music recording studio or

business, a corporate media production department, or a multimedia production team. Resumé writing, communication skills, and job interview techniques. CSU

**BCST 165B. Industry Internship (2)**

Lec-1, conf-.5, work 8 hrs P/NP Available

*COREQ: Enrollment in 7 units of course work(including this course) and consent of instructor*

*Repeat: max. 4 units*

Observation and supervised off-campus experience in an approved broadcast electronic media industry installation such as a television station, a video production firm, a radio station, a music recording studio or business, a corporate media production department, or a multimedia production team. Resumé writing, communication skills, and job interview techniques. CSU

## Computer Networking and Information Technology

**CNIT 10. Careers in Computer Networking and Information Technology (1)**

Lec-1, lab-1, field trips P/NP Available

Introduction to new technologies and employment opportunities in computer networking and information technology. Guest speakers currently working in the field describe the goals, working conditions, pay levels, and training required to succeed in the field today. Students perform hands-on projects with new technologies and techniques. CSU

**CNIT 30. Internet Safety (1)**

Lec-1, lab-1 P/NP Available

For all people who are users of the World Wide Web and e-mail to learn the best practices to follow to avoid common malicious invasions over the Internet. The course includes an overview of security dangers, a review of simple procedures that can be adopted by all users, and descriptions and demonstrations of protective software utilities. CSU

**CNIT 60. Introduction to Internet Protocol Version 6 (1)**

Lec-1, lab-1 P/NP Available

*PREREQ.: CNIT 106 or CNIT 201E or demonstration of IPv4 Networking knowledge*

Essential concepts of Internet Protocol Version 6 (IPv6). Migration IPv4 to IPv6 including its impact on Network Address Translation. Practice in: deployment of IPv6 on routers, Web servers, Email servers and DNS servers. Preparation for the Hurricane Electric IPv6 Certification. CSU

**CNIT 70. WiFi Basics (1)**

Lec-1, lab-1 P/NP Available

Understand wireless networking for homes and small offices. An overview of important topics, including non-technical explanations, a review of currently available equipment, and system installation. A major emphasis on basic measures to protect the data and secure the system. CSU

**CNIT 80X. Communications Convergence Workshops (1)**

Lec-1, lab-1 P/NP Available

*Repeat: max. 3 units*

Introduction of at least six communications technologies with emphasis on their contribution to the convergence of voice, data and video transmission. Technologies introduced may include among others: Fiber Optic, Wi-Fi, Voice over IP, IPTV, Routing fundamentals, Wide Area Ethernet. CSU

**CNIT 100. Introduction to Computers Using PCs (3)**

Lec-3, lab-3

A computer literacy course using IBM-compatible computers. Prepares students to use computers to write papers, organize information, and use e-mail. Overview of computer components, hardware and software. Fundamentals of the Windows and other operating systems and applications such as word processing,

spreadsheets, database, and e-mail and the Internet. Students use computers to complete their class assignments. UC/CSU

### **CNIT 101. Operating Systems I - Windows (3)**

Lec-3, lab-3

*ADVISE: CNIT 100.*

*Repeat: max. 6 units*

A technical course about the Microsoft Windows operating system for students who have some computer experience. Learn techniques to manage a personal computer through the use of operating system utilities and commands. Practice setting up and customizing the interface and managing programs and data. Manage the computer system hardware. Compare several graphical user interfaces and command line interfaces. CSU

### **CNIT 102. Operating Systems II - Command Line (3)**

Lec-3, lab-3

*ADVISE: CNIT 101.*

An advanced course covering the use of the MS-DOS command line interface. This course is especially for students planning to earn a certificate in Windows Hardware, or for advanced Windows users. Use of DOS commands and utilities. A detailed examination of batch files, CONFIG.SYS, AUTOEXEC.BAT, redirection and piping. Use of the DOS editor. CSU

### **CNIT 102W. World Wide Web (1)**

Lec-1, lab-1 P/NP Available

Introduction to the World Wide Web Internet service. Use of browsers and search tools. Create home pages. Use web browsers to access other Internet services such as email, ftp, newsgroups and telnet. CSU

### **CNIT 103. Computer Hardware (3)**

Lec-3, lab-3 P/NP Available

*ADVISE: CNIT 100 or 101 or 102.*

This course provides the knowledge and skills needed to install hardware, configure, repair and maintain computer system in a typical office environment. Topics include hardware components and peripherals, assembly, upgrading and basic troubleshooting. CSU

### **CNIT 103L. Computer Hardware Lab (1)**

Lab-3 P/NP Available

*PREREQ.: CNIT 103.*

A project-oriented hands-on introduction to hardware identification, maintenance, upgrade, diagnosis, and troubleshooting. Designed to provide practice with concepts, techniques and procedures covered in CNIT 103. Teamwork will be emphasized. CSU

### **CNIT 104. Operating Systems Technologies (3)**

Lec-3, lab-2

*PREREQ.: CNIT 103.*

This course provides the knowledge and skills to select and install system software, and to diagnose and troubleshoot system problems due to software configuration. Covers all aspects of the operating system, configuration files, drivers, and resource allocation. Topics include computer architecture and the interaction of hardware and software, documentation, command line operations, use of utilities for diagnostics and for configuration, and editing the Registry. CSU

### **CNIT 104L. Operating Systems Technologies Lab (1)**

Lab-3 P/NP Available

*PREREQ.: CNIT 104.*

A project-oriented hands-on introduction to the technical requirements of computer software: installation, configuration, modification, and troubleshooting. Designed to provide hands-on familiarity and practice

with concepts, techniques and procedures covered in CNIT 104. Troubleshooting and teamwork will be emphasized. CSU

### **CNIT 105. IT Customer Support (3)**

Lec-3, Lab-3 P/NP Available

*PREREQ.: CNIT 104. ADVISE: CNIT 106 or 101 or 102.*

Overview of the concepts and procedures associated with operating a technical support center or help desk call center, with particular emphasis on technologies that can facilitate the work and generate statistics. Extensive simulated and hands-on experience, role-playing and problem solving to practice good customer service and communication skills. CSU

### **CNIT 105L. Computer Technical Support Lab (1)**

Lab-3 P/NP Available

*ADVISE: CNIT 105.*

Introduction to hardware diagnosis and troubleshooting, and software maintenance, upgrading, and problem-solving; including the opportunity to work with real Help Desk software to log calls, and, at times, real end-user problems; and to work with a variety of real hardware problems in a simulated Service Center. Designed to provide hands-on practice with hardware and software, techniques and procedures covered in CNIT 105. Teamwork will be emphasized. CSU

### **CNIT 106. Introduction to Networks (3)**

Lec-3, lab-2 P/NP Available

*ADVISE: CNIT 100 or 101.*

An analysis of technologies for connecting computers and computer related devices into networks. This course covers the terminology and the major components of networks: architecture, topologies, hardware components, connections, protocols, network operations, network administration, support, and troubleshooting. Wide Area Networks (WANs) are also covered. Follows the objectives of the CompTIA Net+ certification exam. CSU

### **CNIT 106C. Introduction to Network Convergence (3)**

Lec-3, lab-3 P/NP Available

*ADVISE: CNIT 100.*

Overview of technologies used to deliver combined telephone, LAN, WAN, wireless, voice, video, and internet protocol including interoperability methods and techniques to integrate disparate systems and technologies. Integrated data (VVID) over IP networks providing seamless and secure communications solutions for business and home. Aligned with Comp TIA convergence +certification exam. CSU

### **CNIT 107. Wireless LANs (3)**

Lec-3 P/NP Available

*ADVISE: CNIT 106 or 201E or 342*

Knowledge and skills needed to select, install and configure wireless networks, including: fundamentals and standards of wireless communication, installation of network access point, and installation, configuration and management of typical products. Also included: common applications, monitoring the network, security, troubleshooting, upgrade and modification. Students in this course should be familiar with LAN Technologies. CSU

### **CNIT 108. Wireless Networks, Advanced (3)**

*PREREQ.: CNIT 107.*

Knowledge and skills to design, install, configure, manage, and maintain wireless networks, including: advanced fundamentals of wireless communication, current and developing standards and protocols, boosting signal strength, detecting and extending signals, troubleshooting common problems, monitoring the network, security issues, and research and analysis of proposed and developing security solutions. Follows the objectives for the Certified Wireless Network Administrator (CWNA) Examination. CSU

### **CNIT 109. Wireless Security (3)**

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Lec-3, lab-3 P/NP Available

*PREREQ.: CNIT 106 or 120 or 107 or 108.*

Provides knowledge, skills, and procedures to address the wireless attacks on a computer network, to identify and eliminate known vulnerabilities in wireless networks, and to implement solutions to protect data and to keep the systems running. Known and common attacks on wireless systems are examined and discussed, and levels of security and developing standards are examined. Follows the objectives of the Certified Wireless Security Professional (CWSP) industry certification. CSU

### **CNIT 113. Technology of Smartphones & Mobile Devices (3)**

Lec-3, lab-3 P/NP Available

*ADVISE: CNIT 100*

Overview of mobile device technologies with an emphasis on smartphones. This course will introduce the technologies behind smartphones including the cellular networks, operating systems, browsers, hardware, and security. Topics include device selection, international network considerations, security, malware, and data back up. CSU

### **CNIT 120. Network Security (3)**

Lec-3

*ADVISE: CNIT 106 or 201E*

Knowledge and skills required for Network Administrators and Information Technology professionals to be aware of security vulnerabilities, to implement security measures, to analyze an existing network environment in consideration of known security threats or risks, to defend against attacks or viruses, and to ensure data privacy and integrity. Terminology and procedures for implementation and configuration of security, including access control, authorization, encryption, packet filters, firewalls, and Virtual Private Networks (VPNs). CSU

### **CNIT 121. Computer Forensics (3)**

Lec-3, lab-3 P/NP Available

*PREREQ.: CNIT 120.*

The class covers forensics tools, methods, and procedures used for investigation of computers, techniques of data recovery and evidence collection, protection of evidence, expert witness skills, and computer crime investigation techniques. Includes analysis of various file systems and specialized diagnostic software used to retrieve data. Prepares for part of the industry standard certification exam, Security+, and also maps to the Computer Investigation Specialists exam. CSU

### **CNIT 122. Firewalls (3)**

Lec-3, lab-3 P/NP Available

*PREREQ.: CNIT 106 or 120.*

Fundamentals, techniques, and procedures to design an effective secure Internet connection using software or hardware firewalls. Discussion of types of firewalls, packet filtering, proxy servers, Intrusion Detection Systems, and Virtual Private Networks (VPNs). CSU

### **CNIT 123. Ethical Hacking and Network Defense (3)**

Lec-3, lab-3 P/NP Available

*ADVISE: CNIT 106 or 120.*

Learn how hackers attack computers and networks, and how to protect Windows and Linux systems. Legal restrictions and ethical guidelines will be taught and enforced. Students will perform many hands-on labs, both attacking and defending, using port scans, footprinting, buffer overflow exploits, SQL injection, privilege escalation, Trojans, and backdoors. CSU

### **CNIT 124. Advanced Ethical Hacking (3)**

Lec-3, lab-3 P/NP Available

*PREREQ.: CNIT 123.*

Advanced techniques of defeating computer security, and countermeasures to protect Windows and Unix/Linux systems. Hands-on labs include Google hacking, automated footprinting, sophisticated ping  
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and port scans, privilege escalation, attacks against telephone and Voice over Internet Protocol (VoIP) systems, routers, firewalls, wireless devices, Web servers, and Denial of Service attacks. CSU

**CNIT 125. Information Security Professional Practices (3)**

Lec-3, lab-3 P/NP Available

*ADVISE: CNIT 123*

Covers information security in depth, including access control, application security, enterprise continuity, cryptography, technical risk management, physical security, and telecommunications and network security. This class helps to prepare students for the Certified Information Systems Security Professional (CISSP) credential, which is essential for high-level information security professionals. CSU

**CNIT 129. Web 2.0 Internet Technologies (3)**

Lec-3, lab-3 P/NP Available

*ADVISE: CNIT 100.*

Overview of Web 2.0 Internet technologies. Techniques for contributing and sharing documents, photos, videos and other data using blogs, wikis, social networking, video and photo sharing websites, and other tools. CSU

**CNIT 131. Internet Basics and Beginning HTML (3)**

Lec-3, lab-3 P/NP Available

*Repeat: max. 9 units*

Methods of using the Internet. History, design and protocol methods used on Internet including: electronic mail, mailing lists, Usenet, connection to remote computers, file transfer, World Wide Web, basic web page creation and publishing. Additional topics include: file compression and expansion, computer security, copyright and electronic commerce, and basic Unix shell commands. CSU

**CNIT 131A. XML-Extensible Markup Language (3)**

Lec.-3, lab-3 P/NP Available

*ADVISE: CNIT 131*

Introduction to eXtensible Markup Language (XML) and document structuring. Hands-on experience with XML documents, Document Type Definition (DTD), namespaces, schemas, data parsing with Document Object Model (DOM) and data presentation with extensible Style Language (XSLT), XPath and Cascading Style Sheets (CSS). CSU

**CNIT 132. Intermediate HTML and XHTML (3)**

Lec-3, lab-3

*ADVISE: CNIT 131.*

*Repeat: max. 9 units*

Use of HTML to publish information on the World Wide Web, including the use of color, images, tables, and frames. Cascading Style Sheets are used to standardize the appearance of information within a page and across pages in a site. Introduction to scripting languages, Dynamic HTML, forms and CGI. Introduction to secure data transfer. Discussion of privacy, copyright, and accessibility issues. CSU

**CNIT 133. Interactive Web Pages-JavaScript and AJAX (3)**

Lec-3, lab-3 P/NP Available

*ADVISE: CNIT 132*

Creation of interactive Web pages using JavaScript, including properties, methods, objects, and event handlers of the Document Object Model. Creation of interactive Web pages using AJAX technologies. CSU

**CNIT 133M. Mobile Web w/HTML, CSS & JS (3)**

Lec-3 P/NP Available

*PREREQ.: CNIT 133 or demonstration of exit skills*

Conversion of desktop websites and an introduction to building web applications for smart phones and mobile devices with intermediate HTML and JavaScript. Includes jQuery and intermediate CSS for *Pathways to ICT Education and Careers in San Francisco*



controlling the appearance of mobile device websites and introduction of some development platforms. CSU

### **CNIT 134. Server-side Technologies for the Web (3)**

Lec-3, lab-3 P/NP Available

*PREREQ.: CNIT 133 or CS 110A or 111A or 112A or 113A or 183B.*

Creation of original server-side scripts using a variety of techniques such as: (i) Extensible Markup Language (XML) and its subsets: Extensible Style Language Transformation (XSLT), XML Schemas and Web Services and (ii) ASP.NET server controls and its data access with ADO.NET. CSU

### **CNIT 135. E-Commerce Web Site Development (3)**

Lec-3, lab-3 P/NP Available

*PREREQ.: CNIT 134*

Provides knowledge, skills and practice to develop and implement an interactive e-commerce web site using Microsoft ASP.NET and Visual Studio.NET. Manage databases to edit, update, and retrieve information. Display a simple product catalog, implement a shopping cart and checkout process, as well as secure transactions with authentication and authorization. A team project will be assigned, where students will design and build a working site integrating the topics covered in the class. Based on material covered in CNIT 134. CSU

### **CNIT 150. Digital Home Technology Integration (3)**

Lec-3, lab-3 P/NP Available

*ADVISE: CNIT 103.*

Basics of home networking, audio and video installation for professionals. Includes telephone and VoIP, security and surveillance systems, home control management and troubleshooting. Prepares for the CompTIA DHTI+ Certification. CSU

### **CNIT 190. Internet Systems Analysis and Design (3)**

Lec-3

*PREREQ.: CNIT 106.*

Study of concepts, terminology, and methods to analyze, design, implement and improve Internet-based enterprises. Techniques to analyze requirements and plan a project appropriately and implement an integrated solution. Case studies are reviewed as examples, and real-world team projects and presentations are assigned. CSU

### **CNIT 197. Internship and Work Experience (1)**

Conf-2, Work-5

*PREREQ.: CNIT 132 or 104 and 106 or 201 or 241 and approval of CNIT Work Experience Coordinator*

*Repeat: max. 3 units*

Work experience in supervised on- or off-campus work involving the use of computers. Internship programs are joint ventures between institutions or companies in the Bay area and the Computer Networking and Information Technology Department. Students must be employed in any area including, but not limited to, help desk, hardware technician, networking technician, system administration, internet or computer operation. CSU

### **CNIT 198. Internship and Work Experience (2)**

Conf-2, Work-10

*PREREQ.: CNIT 132 or 104 and 106 or 240 or 201 COREQ.: Enrollment in 7 units of coursework including this course or consent of instructor*

*Repeat: max. 6 units*

Work experience in supervised on- or off-campus work involving the use of computers. Internship programs are joint ventures between institutions or companies in the Bay area and the Computer Networking and Information Technology Department. Students must be employed in any area including, but not limited to, help desk, hardware technician, networking technician, system administration, internet or computer operation. CSU

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**CNIT 199. Independent Study (1-3)**

Ind st-5/10/15

*PREREQ.:* CNIT 104 or 202 or 132 or 241

*Repeat:* max. 9 units (no subject repeat)

Large-scale individual projects in Computer Networking and Information Technology to be defined in cooperation with an instructor-supervisor. The project must be in an area not covered by other course offerings. CSU

**CNIT 201E. Network Fundamentals (3)**

Lec-2, lab-3, conf-1 P/NP Available

*ADVISE:* CNIT 100.

Architecture, structure, functions, components, and models of the Internet and other computer networks. Use of the OSI and TCP layered models to examine protocols and services. IP addressing and subnetting. Fundamentals of Ethernet concepts, media, and operations. First course of the Cisco Networking Academy Exploration series preparing for the CCNA Certification. CSU

**CNIT 202E. Routing Protocols and Concepts (3)**

Lec-2, lab-3, conf-1 P/NP Available

*PREREQ.:* CNIT 201E.

Architecture, components, and operation of routers, and principles of routing and routing protocols. Analysis, configuration, verification, and troubleshooting of the primary routing protocols RIPv1, RIPv2, EIGRP, and OSPF CSU

**CNIT 203E. LAN Switching and Wireless (3)**

Lec-2, lab-3, conf-1 P/NP Available

*PREREQ.:* CNIT 201E.

LAN switch operation and implementation for small and large networks. Analysis, configuration, verification and troubleshooting of VLANs, Rapid Spanning Tree Protocol (RSTP), VLAN thinking Protocol (VTP), Inter-VLAN routing and wireless network operations. Introduction of campus network design and Layer 3 switching concepts. CSU

**CNIT 204E. Accessing the WAN (3)**

Lec-2, conf-1, lab-3 P/NP Available

*PREREQ.:* CNIT 202E and 203E.

Wide Area Network (WAN) converged applications and quality of service (QoS). WAN technologies including PPP, Frame Relay, and broadband links. WAN security, including types of threats, how to analyze network vulnerabilities, general methods for mitigating common security threats and types of security appliances and applications. Principles of traffic control and access control lists (ACLs). IP addressing services implementation, including NAT, DHCP and IPv6. CSU

**CNIT 205P. Building Scalable Internetworks (3)**

Lec-2, conf-1, lab-3 P/NP Available

*PREREQ.:* CNIT 204E or CCNA certification or demonstration of CNIT 204E exit skills.

Install, configure, monitor, and troubleshoot network infrastructure equipment according to the Campus Infrastructure module in the Enterprise Composite Network model. Topics include how to configure EIGRP, OSPF, IS-IS, and BGP routing protocols and updates between these. Also multicast routing, IPv6, and DHCP configuration. Prepares for CCNP Exam 642-901. CSU

**CNIT 207P. Building Cisco Multilayer Switched Networks (3)**

Lec-2, conf-1, lab-3 P/NP Available

*PREREQ.:* CNIT 204E or CCNA Certification or demonstration of CNIT 204E exit skills

Advanced skills required to install, configure, monitor, and troubleshoot enterprise-class switched networks, including wireless LANs, basic Quality of Service to support voice, high-availability features,

and enhanced security for switches. Aligns with the Building Cisco Multilayer Switched Network (BCMSN) 642-812 exam. CSU

### **CNIT 209. Operating Juniper Routers in the Enterprise (3)**

Lec-2, lab-3, conf-1 P/NP Available

*PREREQ.: CNIT 204E or demonstration of CNIT 204E exit skills.*

Preparation for Juniper Networks Certified Internet Associate certification (JNCIA-ER, Exam JNO-342). JUNOS configuration via Command line and J-Web Interfaces. JUNOS routing policy application for Internal Gateway Routing Protocols, Packet Filtering and Router management. CSU

### **CNIT 209J. Junos Software and Routing (3)**

Lec-3, lab-3

*PREREQ.: CNIT 106 or 201E or demonstration of knowledge of basic networking, the Open Systems Interconnection (OSI) reference model, and the TCP/IP protocol suite*

Junos Operating System: interface options, initial and secondary system configurations, operational monitoring and maintenance. Routing fundamentals: static routing and Open Short Path First (OSPF) dynamic routing, routing policy and firewall filters. Class of Services. Border Gateway Protocol (BGP). Load Balancing and High Availability Networks. Prepares for the Juniper Networks Certified Internet Associate (JNCIA-Junos) - JNO- 100 Certification. CSU

### **CNIT 210. Advanced Juniper Networks Routing in the Enterprise (3)**

Lec-2, lab-3, conf-1 P/NP Available

*PREREQ.: CNIT 209.*

Preparation for Juniper Networks Certified Internet Specialist (JNCIS-ER, Exam JNO-350. JUNOS policy, BCP for enterprises, IGP conversion, Layer 2 services, Layer 3 services overview, stateful firewall and NAT/PAT, IPSec VPNs, class of service, branch office connectivity, router management. CSU

### **CNIT 211. Fiber Optic Technology (3)**

Lec-3, lab-3

*PREREQ.: ET108A or MATH 40 or 840, or demo of ET 108A or MATH 40 or 840 exit skills*

Covers fundamental principles and hands-on application of modern fiber optic technology, preparing students to use current technology and giving them the basis required to adapt to future developments. Topics include telecommunications, optics, fiber fabrication, splicing, and termination, lasers, LEDs, detectors and optical amplifiers, optical protocols including FDDI and SONET, and network design and troubleshooting. Students will perform many hands-on labs using fiber optic cable and related equipment. CSU

*CNIT 211=ELEC 211*

### **CNIT 212. Cisco Wireless (3)**

Lec-3, lab-3 P/NP Available

*PREREQ.: CNIT 107 or 108.*

Fundamentals, techniques, and procedures to design an effective Wireless Wide Area Network for a large-scale enterprise, to perform a site survey; and to select, install, configure, and modify the devices and settings to maximize performance while maintaining security. Wireless bridges, repeaters, and antennas will be installed, and wireless Virtual Local Area Networks (VLANs) will be configured to provide the best security for the network. CSU

### **CNIT 215. Voice Over IP Fundamentals (VoIP) (3)**

Lec-2, conf-1, lab-3

*PREREQ.: CCNA Certification.*

This course will cover the fundamentals of Voice over IP technologies (VoIP), as well as the convergence of voice and data networks. Configuration of Cisco Call Manager Express (CCME) architecture, router and switch hardware components needed for deploying VoIP, and the integration of the public switched telephone network into a VoIP system will be covered in a lecture and hands-on lab setting. CSU

**CNIT 221. Cisco PIX Firewall and Router Security (3)**

Lec-2, conf-1, lab-3

*PREREQ.: CCNA Certification*

This course focuses on the overall security processes with particular emphasis on: hands on skills with Cisco PIX firewall; secure router design, installation, configuration; Authentication, Authorization, and Accounting (AAA) implementation using routers and firewalls; Intrusion Detection (IDS) implementation using routers and firewalls; and VPN implementation using routers and firewalls. CSU

**CNIT 270. Unix/Linux Network Services (3)**

Lec-3, lab-3 P/NP Available

*PREREQ.: CNIT 106 or 201 or 240; and completion of or concurrent enrollment in CS 260A.*

Configuring and maintaining Unix/Linux networks and network services, including network design, adding hosts, configuring network services such as DNS, NFS, NIS, e-mail and network printing, performing software and kernel updates, routing, routing protocols, and troubleshooting. CSU

**CNIT 271. Apache Web Server Introduction (1)**

Lec-1, lab-1 P/NP Available

*PREREQ.: CS 160A and CNIT 106.*

Introduction to setting up and configuring the Apache Web Server. The course covers how to download and install Apache, configure CGI scripting to run scripts on the server, protect document directories with authentication, and using virtual hosting to support multiple hostnames on the same server. CSU

**CNIT 272. Apache Web Server Advanced (2)**

Lec-2, lab-2 P/NP Available

*ADVISE: CNIT 131, 270, and 271*

Advanced class on administering the Apache Web Server. Setting up complex virtual hosting, multiple types of authentication and dynamic content, adding modules to support LAMP, optimizing server performance, web server security, including SSL, and troubleshooting. CSU

**CNIT 342. Windows Server Administration (3)**

Lec-3, lab-3 P/NP Available

*ADVISE: CNIT 101 and CNIT 106 or CNIT 106C or CNIT 201E*

Knowledge and skills required to manage accounts and resources, maintain server resources, monitor server performance, and safeguard data in Microsoft Windows Server 2008 environment. Aligned with Microsoft Certified IT Professional (MCITP) exam 70-646. CSU

**CNIT 343. Windows Server Network Infrastructure (3)**

Lec-3, lab-3 P/NP Available

*ADVISE: CNIT 342*

Knowledge and skills that are required to manage Dynamic Domain Name Servers, configuration of Server File Systems, Dynamic Host Configuration Protocol (DHCP) servers, Securing Data Transmission, configuring Routing and Remote Access and maintaining and updating File Services. This course is aligned with the Microsoft Certified IT Professional (MCITP) exam 70-642. CSU

**CNIT 345. Windows 7 Technical Support (3)**

Lec-3, lab-3 P/NP Available

*PREREQ.: CNIT 101 or demonstration of technical knowledge of Windows operating systems*

Knowledge, skills, and hands-on experience to install, configure, and maintain Windows 7 operating system. Course aligned with the "Microsoft Certified Technology Specialist: Windows 7, Configuration" certificate. CSU

**CNIT 351. SQL Server Administration (3)**

Lec-3, lab-3 P/NP Available

*PREREQ.: CNIT 342 or demonstration of technical knowledge of Windows Server administration*

This course is about SQL Server database management system. In this advanced course, students will gain the knowledge and skills to install and configure SQL Server and manage the day-to-day administration of a client/server database in an enterprise network environment. CSU

**CNIT 352. Exchange Admin & Mobile Device (3)**

Lec-3, lab-3 P/NP Available

*PREREQ.:* CNIT 343

Knowledge and skills needed to configure and manage an Exchange Server messaging environment. Provide guidelines, best practices, and considerations that will help optimize and Exchange Server deployment. Targets MCTS (Microsoft Certified Technology Specialist) Exam 70-662: Microsoft Exchange Server 2010. CSU

## Computer Science Department

**CS 100. Introduction to Computer Science (3)**

Lec-3, lab-1 P/NP Available

Introduction to computer science. Emphasis is on properties of algorithms, hardware design, system software and networks, computer organization, data representation, languages, theory of computation, applications and social issues. Students learn algorithms and use programming techniques to solve problems. UC/CSU

**CS 100M. Introduction to Computers Using Macintosh (3)**

Lec-3, lab-3 P/NP Available

A computer literacy course using Macintosh computers. Prepares students to use computers to write papers, organize information, and use e-mail. Overview of computer components such as hardware, software and data. Fundamentals of the Finder and applications such as word processing, spreadsheets and the Internet. Students use computers to complete class assignments. UC/CSU

**CS 101. Intro to Information Systems (3)**

Lec-3, lab-0.5

Introduction to the uses and technology of computers. Emphasis is on the vocabulary of computer systems, hardware, software, networks, data representation and manipulation, communications, the Internet, ethics and privacy issues, and developments and trends. Survey of job opportunities in the computer field and how computers are used in business, research and government. Students use a computer application (spreadsheet) as a problem-solving tool and use macros and Visual Basic for Applications to learn programming fundamentals. UC/CSU

**CS 110A. Intro to Programming: C++ (3)**

Lec-3, conf-1, lab-3

*ADVISE:* MATH 40 or 840

Introduction to computer programming and problem-solving. No prior programming experience required. Course concepts include: problem solving techniques, algorithms, program design, control structures, functions, arrays and use of the C++ programming language. UC/CSU

**CS 110B. Programming Fundamentals: C++ (3)**

Lec-3, conf-1, lab-3

*PREREQ.:* CS 110A.

This course covers pointers, arrays with structured elements, file handling, dynamic memory allocation, and building abstract data types. Programming assignments require planning, good coding practices, and documentation. Applications include both numerical and non-numerical problems. UC/CSU

**CS 110C. Data Structures and Algorithms: C++ (3)**

Lec-3, conf-1, lab-3

*PREREQ.:* CS 110B.

A course in the analysis and design of computer algorithms and the underlying data structures using an object-oriented approach. Analysis in the timing and efficiency of algorithms. Study of lists, stacks, queues, trees, searching, sorting, and recursion. Introduction to UML, heaps, graphs, tables, hashing, and direct access files. Further study of abstract data types. UC/CSU

**CS 111A. Intro to Programming: Java (3)**

Lec-3, conf-1, lab-3

*ADVISE: MATH 40 or 840*

Introduction to computer programming and problem solving. No prior programming experience required. Course concepts include: problem solving techniques, algorithms, program design, control structures, functions, arrays and use of the Java programming language. UC/CSU

**CS 111B. Programming Fundamentals: Java (3)**

Lec-3, conf-1, lab-3

*PREREQ.: CS 110A or CS 111A.*

A continuation of the concepts introduced in CS 111A, Introduction to Programming, using Java as the programming platform. An object-oriented approach to problem solving. Classes, objects, references, dynamic memory allocation, inheritance, polymorphism, arrays, files. Design and implementation of abstract data types. Numerical and non-numerical applications. UC/CSU

**CS 111C. Data Structures and Algorithms: Java (3)**

Lec-3, conf-1, lab-3

*PREREQ.: CS 111B.*

The analysis and design of computer algorithms and their underlying data structures. Analysis of the timing and efficiency of algorithms. Study of lists, stacks, queues, trees, backtracking, searching, sorting and recursion. Introduction to graphs, hash tables, heaps, priority queues and direct access files. Further study of abstract data types and object-oriented programming. UC/CSU

**CS 112A. Intro to Visual Basic.NET (3)**

Lec-3, conf-1, lab-3 P/NP Available

*ADVISE: MATH 40 or 840*

A beginning course in computer programming and problem solving using Visual Basic.NET. Students develop Windows-oriented application programs with emphasis on standard programming concepts and algorithms, interface design, and event processing using the .Net development platform. UC/CSU

**CS 112B. Visual Basic.NET Object-Oriented (3)**

Lec-3, conf-1, lab-3 P/NP Available

*PREREQ.: CS 112A.*

A continuation of CS 112A. Design and implementation of classes, objects, abstract data types, arrays, and collections. Use of inheritance, polymorphism, and structured exception handling. Development of Windows-oriented application programs with emphasis on objectoriented programming concepts and techniques. CSU

**CS 112D. Visual Basic.NET w/ Databases (3)**

Lec-3, conf-1, lab-3 P/NP Available

*PREREQ.: CS 112A or experience programming with Visual Basic; and CS 150A or 151A or 155A or experience SQL queries ADVISE: CS 112B*

An intermediate course in computer programming and problem solving using Visual Basic.NET and ADO.NET. Students develop Windows-oriented application programs that interface with databases (SQL Server, Access, or Oracle) using the ADO.NET data access model. CSU

**CS 113A. Introduction to Perl Programming (3)**

Lec-2, conf-1, lab-3 P/NP Available

*ADVISE: CS 160A.*

An introduction to the interpreted language called Perl, the Practical Extraction and Report Language. Recommended for anyone working with files and text. This course covers the semantics and syntax of the Perl language, and includes discussion on the practical kinds of problems that Perl can solve and provides examples. Students write stand-alone programs that perform various tasks, including text and file manipulation. UC/CSU

**CS 113B. Object Oriented Perl Programming (3)**

Lec-2, conf-1, lab-3

*PREREQ.: CS 113A*

A continuation of the concepts and principles introduced in CS 113A, Introduction to Perl Programming using an objected-oriented approach to problem solving and program development. Packages, objects, references, nested data structures, advanced regular expressions, CGI and DBM topics are covered. Students write stand-alone and CGI programs to solve common data processing and system administration tasks. CSU

**CS 114B. Programming Fundamentals I/C# (3)**

Lec-3, conf-1, lab-3 P/NP Available

*PREREQ.: CS 110A or 111A or 112A or similar programming experience*

A continuation of the concepts and principles introduced in CS 110A or 111A. It covers programming using the C# language and the .NET / Common Language Runtime platform. Students will learn Object Oriented software design techniques, and construct Graphical User Interface applications. CSU

**CS 130A. PHP Programming (3)**

Lec-3, conf-1, lab-3 P/NP Available

*ADVISE: CNIT 132 or demo of exit skills; and CS 110 or 111A or 112A or 113A or 131A or similar programming experience*

Introduction to the open source Web scripting language PHP. Recommended for anyone needing to build dynamic Web sites and Web applications. Semantics and syntax of the PHP language, including discussion on the practical problems that PHP solves. Students write server-side, cross-platform, HTML embedded scripts that perform various tasks, including implementing dynamic Web pages that interact with databases and files. CSU

**CS 130B. Advanced PHP Programming (3)**

Lec-3, lab-3 P/NP Available

*PREREQ.: CS 130A.*

This class covers using PHP for database connectivity to build scalable, dynamic websites. Assignments emphasize using PHP for user authentication, site personalization, content management, session tracking, and user-driven database updating. A class project demonstrates using PHP and a database (MySQL) to build a scalable, object oriented, template-based e-commerce website. CSU

**CS 131A. Python Programming (3)**

Lec-3, conf-1, lab-3 P/NP Available

*ADVISE: CS 110A or 111A or 113A or 130A or 112A or 161 or 160B.*

Introduction to the interpreted, interactive, object-oriented language Python. Recommended for anyone needing a general-purpose programming language and for those performing web site or system administration. Semantics and syntax of the Python language, including discussion on the practical problems that Python solves. Students write stand-alone programs that perform various tasks including interfacing to system calls and libraries; sending and retrieving information from web sites; and, connecting to databases. CSU

**CS 132A. Ruby Programming (3)**

Lec-3, lab-3 P/NP Available

*ADVISE: CS 110A or 111A or 113A or 130A or 112A or 161 or 160B.*

Recommended for anyone using the Ruby on Rails web framework, performing general-purpose programming, or web site or system administration. Solution of practical problems. Useful object-oriented

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design patterns. Creating stand-alone programs that interface to system calls and libraries and create a MVC (Model-View-Controller) web site that connects to databases. CSU

### **CS 132R. Ruby on Rails Workshop (1)**

Lec-1 P/NP Available

*ADVISE: CS 110A, 111A, 112A, 113A, 130A, or other computer programming course*

Demonstration of the Ruby on Rails web framework. Brief survey of Ruby programming language and Model View Controller design pattern. Ruby on Rails installation, including an installation on student's computer and ISP deployment. Build a shopping cart application with Content Management, User Authentication, Checkout System, Unit Testing, and AJAX capabilities. CSU

### **CS 141. Mastering Regular Expressions (1)**

Lec-1, lab-1 P/NP Only

*PREREQ.: Prior programming experience*

Practice in the use of regular expressions to solve practical text processing techniques. Students can choose to solve problems in the language of their choice. CSU

### **CS 142. Programming Techniques for XML (2)**

Lec-2, lab-2 P/NP Available

*PREREQ.: CS 110A or 111A 112A or 113A or 130A or 131A, or similar programming experience.*

Programming techniques for processing XML data. Comparison of programming approaches, including SAX, SAX-like, and DOM interfaces. Navigating, filtering, and modifying XML. Transformation of XML data CSU

### **CS 150A. SQL Server Databases (3)**

Lec-3, lab-3 P/NP Available

A course in the use of the SQL Server database management system to create, update and query database tables. This course covers both the syntax and the logic of the major features of the T-SQL language. The course includes a brief introduction to the programming aspects of T-SQL. CSU

### **CS 150P. SQL Server Programming Using T-SQL (4)**

Lec-4, lab-4 P/NP Available

*PREREQ.: CS 150A or 151A or 155A or prior SQL experience*

An advanced course in the use of Microsoft SQL Server techniques. Design and develop SQL Server program units using the T-SQL language: stored procedures, user-defined functions, and database triggers. Create Visual Basic NET CLR (Common Language Runtime) routines for use in SQL Server. Work with dynamic SQL and with XML data. CSU

### **CS 151A. Oracle SQL Databases (3)**

Lec-3, lab-3 P/NP Available

A course in the use of Oracle database management system to create, update, and query database tables. The course covers both the syntax and the logic of the major features of the Oracle SQL language. The course includes a brief introduction to the programming aspects of PL/SQL. CSU

### **CS 151B. Oracle Database Administration (3)**

Lec-3, lab-3 P/NP Available

*PREREQ.: CS 150A or 151A. ADVISE: CS 160A.*

An advanced course in the architecture, design, configuration, installation, and maintenance of an Oracle relational database management system. Student will gain the knowledge and skills needed to administer an Oracle client/server database in an enterprise network environment. CSU

### **CS 151P. Oracle PL/SQL Programming (4)**

Lec-4, lab-4 P/NP Available

*PREREQ.: Completion of or concurrent enrollment in CS 151A or experience writing SQL.*



An intermediate course in the use of the PL/SQL programming language. Create and manage PL/SQL program units and data structures, stored procedures and functions, database triggers, and packages to process data using database objects. CSU

**CS 155A. MySQL Databases (3)**

Lec-3, lab-3 P/NP Available

A course in the use of MySQL database management system to create, update, and query database tables. The course covers both the syntax and the logic of the major features of the MySQL language. The course includes a brief introduction to the programming aspects of MySQL. CSU

**CS 155B. MySQL Database Administration (3)**

Lec-3, lab-3

*PREREQ.: CS 155A. ADVISE: CS 160A.*

Students install and configure a MySQL server and create and manage user accounts. Issues pertaining to optimization, security, privileges, tuning, troubleshooting, and performing upgrades are studied and practiced. CSU

**CS 155P. Programming with MySQL (3)**

Lec-3, lab-3 P/NP Available

*PREREQ.: CS 155A or 150A or 151A or demonstration of exit skills.*

An advanced course in the use of MySQL techniques to process database objects. Design and develop MySQL program units: stored procedures, functions, and database triggers. Work with dynamic SQL and with XML data. CSU

**CS 159A. Database Design and Modeling (3)**

Lec-3, lab-3 P/NP Available

*PREREQ.: CS 150A or 151A or CS 152A.*

A course in the design of database structures and the use of database modeling tools. CSU

**CS 160A. Introduction to Unix/Linux (2)**

Lec-2, lab-2 P/NP Available

Introduction to using the Unix/Linux operating system. Unix/Linux file management and common text processing utilities including searching. UC/CSU

**CS 160B. Unix/Linux Shell Scripting (2)**

Lec-2, lab-2 P/NP Available

*PREREQ.: CS 160A or demo of CS 160A exit skills.*

Analyze, design, write, test, and debug Unix shell scripts. Students learn basic shell scripting techniques and develop scripting skills needed for Unix/Linux System Administration courses. The bash shell is used. UC/CSU

**CS 161. C for Unix and Linux (3)**

Lec-3, conf-1, lab-3

*PREREQ.: CS 160A. ADVISE: CS 110A or 111A or 112A or 113A or other previous programming experience.*

Computer programming using the C language on Unix and Linux systems. Recommended for students who are studying the Unix and Linux operating systems and who have had some previous programming experience. Standard C header files and Unix documentation are used to implement solutions to programming problems. The Unix compilation system is used and issues about building commonly available software packages are discussed. CSU

**CS 162. Linux Installation (1)**

Lec-1 P/NP Only

*PREREQ.: CS 160A*

The study and practice of the minimal administration skills needed to install a standard Linux or Open Source Unix distribution on a personal computer. An actual installation is performed, either on the student's own computer or on a classroom computer. Alternate sections may install different distributions. An overview is given of Unix/Linux courses for further study. CSU

### **CS 170A. Principles of Artificial Intelligence (3)**

Lec-3, lab-3

*PREREQ.: PHIL 12A. ADVISORY: CS 110A or 111A or 112A.*

Fundamental concepts and techniques of Artificial Intelligence (AI) and the Language of First Order Logic (FOL). Use of simple structure First Order Logic sentences to encode knowledge to be stored and used by a computer. Model thinking by manipulating FOL sentences. FOL will be used as a precise specification language for stating axioms and proving theorems in logic. CSU

### **CS 170P. Prolog Programming (3)**

Lec-3, lab-3, conference-1 P/NP Available

*ADVISE: CS 170A and an introductory course in programming such as CS 110A or 111A or 112A.*

Fundamental concepts and techniques of programming using Prolog. Prolog programming projects will include machine learning, expert systems, goal-oriented programming, and constraint logic programming. CSU

### **CS 172X. Programming with Online Data (3)**

Lec-3, conf-1, lab-3

Computing techniques used in the processing of publicly available data, with an emphasis on scientific data. Explores ways to make local versions of publicly available data, data storage techniques, and data processing techniques, including statistical analysis and data visualization. Students work on a final project in their field of interest. CSU

### **CS 176. Systems Analysis and Design (3)**

Lec-3

*PREREQ.: CS 110A or 111A or 150A or 151A or CS 112A*

Analysis and design of computer-oriented systems from inception to implementation. Problem definition, analysis of present systems, interviewing techniques, questionnaires, cost statements, forms design, presentations, hardware and software alternatives. Case study of a typical commercial data-processing system. CSU

### **CS 177. Software Engineering (3)**

Lec-3, lab-3 P/NP Available

*PREREQ.: CS 110A or 111A or 112A or 113A or 130A or 131A or similar programming experience.*

Overview of the entire software engineering process from start to finish. Includes Analysis, Design, Development, Project Management, Testing, and Evolution. Use of industry techniques and tools including UML diagrams, version control and installation software. UC/CSU

### **CS 180. Designing Interactive Applications with Flash (3)**

Lec-3, lab-3 P/NP Available

*PREREQ.: MMSP 140 or CS 183A*

A course that combines design and programming to show students an overview of what's possible in Flash and provide hands-on experience building web sites and other Flash applications. The class format includes lecture, discussion, hands-on exercises and a final project. CSU

*CS 180 = MMSP 149*

### **CS 183A. Multimedia Tools (3)**

Lec-3, lab-3 P/NP Available

*ADVISE: CS 100M, or CNIT 100 or IDST 120.*

*Repeat: max. 6 units*

Hands-on survey of multimedia theory and practice. Team approach to the design and production of interactive multimedia projects. Multimedia applications, including authoring, video capture, audio capture, and animation. Multimedia hardware, including Macintosh and Windows platforms, audio and video capture cards, and peripherals. CSU

**CS 183B. Flash Game Programming I (3)**

Lec-3, conf-1, lab-3 P/NP Available

*PREREQ.: CS 183A or MMSP 140 or experience using Flash: graphical tools, built-in objects, and how to create timeline-based movies.*

Multimedia game programming using Macromedia Flash ActionScripting. Program design and implementation, including algorithms, data structures, control structures, style, and debugging techniques for the creation of web-based interactive games. CSU

**CS 183C. Advanced Multimedia Programming (3)**

Lec-3, conf-1, lab-3 P/NP Available

*PREREQ.: CS 183B.*

Object-oriented programming for the creation of multimedia projects. Programming games and simulations. Advanced data structures, including multidimensional arrays, queues, and stacks. Inheritance, encapsulation, and polymorphism. CSU

**CS 183F. Flex Programming (3)**

Lec-3, lab-3 P/NP Available

*PREREQ.: CS 110A or 111A or 112A or 130A or 131A or similar programming experience ADVISE: CS 142 or CNIT 134*

Applications using object-oriented programming and XML. Create and customize application layout using built-in and custom-built components for data binding, forms, and validation tasks. Manage state using the Model View Controller design pattern. Debug applications locally and remotely CSU

**CS 198. Industry Internship (1-4)**

Conf-1, Work-5, 10, 15, or 20 P/NP Available

*COREQ.: Enrollment in 7 units including this course and consent of instructor*

*Repeat: max. 3, 6, 9, or 12 units*

Internship programs are joint ventures between institutions or companies in the Bay Area and the Computer Science Department. Students are employed in areas such as computer programming; database administration, programming, or design; Unix/Linux administration or programming; multimedia programming; or other computer science related fields. CSU

**CS 199. Independent Study (1-3)**

Ind st-5/10/15

*PREREQ.: CIS 144; CNIT 135C; CS 110, 111C, 141B, 183B or 260A.*

*Repeat: max. 6 units (new subj.)*

Large-scale individual projects in computer programming to be defined in cooperation with an instructor-supervisor. Student opportunity to complete independent programming study. CSU

*UC upon review*

**CS 211D. Android Programming (3)**

Lec-3, lab-3 P/NP Available

*PREREQ.: CS 111B or demonstration of exit skills*

An advanced course in the design and development of applications for mobile devices running the Android operating system. Students will use the Android SDK to create programs including how to craft User Interfaces (UIs), create location-based applications, and access web services. CSU

**CS 211E. Advanced Java: Enterprise (3)**

Lec-3, lab-3 P/NP Available

*PREREQ.: CS 111B. ADVISE: CS 211S.*

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Advanced Java 2 Enterprise Edition features of the Java language essential for building network and web-oriented applications. Topics include JDBC, RMI, Servlets, JSP, JNI, JavaBeans, XML, and ANT. CSU

**CS 211G. Game Programming in Java (3)**

Lec-3, lab-3 P/NP Available

*PREREQ.: Completion of or concurrent enrollment in CS 111B.*

Core aspects of developing games in Java. Creation and control of geometric elements and sprites, animated characters, and scrolling backgrounds. Keyboard, mouse, and joystick input techniques. Use of imported digital sound effects and images. An overview of enhancing playability by implementing Artificial Intelligence, kinematics, physics, and the element of chance. CSU

**CS 211M. (2)**

Lec-2, lab-2

*PREREQ.: CS 111B. ADVISE: CS 211S.*

Principles of application development on small, limited resource devices using the Java 2 Micro Edition environment with a focus on the Connected Limited Device Configuration (CLDC) and Mobile Information Device Profile (MIDP) architecture. CSU

**CS 211S. Advanced Java: Standard Edition (3)**

Lec-3, lab-3

*PREREQ.: CS 111B*

Introduces advanced Java language features and packages that are essential for building Java Standard Edition applications. Topics include multithreading, collections, networking, and Swing classes. Helps prepare students for industry certification in Java programming. CSU

**CS 211V. Graphics Programming in Java (3)**

Lec-3, lab-3, conference-1 P/NP Available

*PREREQ.: CS 111B.*

Core aspects of creating 2D shapes and GUIs using AWT (Abstract Windowing Toolkit) and Swing. Color, Graphics, Font, and Font metrics classes. Loading and manipulating images within AWT and Swing GUI applications. Using Layout Managers to position GUI controls in Containers. Handling user input using Event and Listener classes. CSU

**CS 212. iPhone Programming (3)**

Lec-3, conf-1, lab-3 P/NP Available

*PREREQ.: CS 110B or 111B or demo of exit skills*

An advanced course in the design and development of Graphical User Interface applications for the iPhone and iPod touch platforms. Students will use XCode and Interface Builder to write Objective C applications on the iPhone SDK. CSU

**CS 232. Ruby on Rails Development (4)**

Lec-4, lab-4, conference-1 P/NP Available

*PREREQ.: CS 132A or demonstration of CS 132A exit skills. ADVISE: CNIT 132.*

Learn to develop data driven web applications using Ruby on Rails. The course covers all of the core aspects of the framework including ActiveRecord, ERB, Rails Controller classes, Action Mailer, and application testing. CSU

**CS 260A. Unix/Linux System Administration (3)**

Lec-3, conf-1, lab-3 P/NP Available

*PREREQ.: CS 160B or demo of CS 160B exit skills.*

Examination of the skills necessary to effectively perform the responsibilities of a UNIX/Linux system administrator such as setting up new users, monitoring system activity, configuring the startup process, managing the file system, performing backups, and maintaining security. Shell programming is used as an aid for automating system administration tasks. CSU

**CS 261A. Unix/Linux Systems Programming (3)**

Lec-3, lab-3 P/NP Available

*PREREQ.: CS 161.*

An overview of Unix/Linux system calls, the functions in the standard library, which access the lowest level resources of the Unix/Linux operating system. Emphasis is on writing programs for controlling file I/O, terminal I/O and buffering characteristics, process handling, signal handling, pipes, file locking, network-based inter-process communication using sockets, and RPC. This course provides concrete examples of the Unix/Linux system call interface using the C and/or C++ programming language. CSU

**CS 261B. Advanced Unix/Linux Systems Programming (3)**

Lec-3, lab-3 P/NP Available

*PREREQ.: CS 261A.*

An advanced course in programming of Unix systems. Emphasis is on writing advanced programs for controlling processes. This course provides advanced examples of the Unix system call interface using the C programming language CSU

**CS 262. Unix/Linux Network Programming (3)**

Lec-3, lab-3 P/NP Available

*PREREQ.: CS 161 and CNIT 106 or 201*

An overview of Unix/Linux system calls, the functions in the standard library, which access the lowest level resources of the Unix/Linux operating system. Emphasis is on writing programs for controlling network-based inter-process communication using sockets, and RPC. This course provides concrete examples of the Unix/Linux system call interface using the C and/or C++ programming language. CSU

**CS 267. Unix and Linux Security (3)**

Lec-3, lab-3

*PREREQ.: CNIT 106 or 201. ADVISE: CS 161 or CNIT 270.*

Security issues on Unix and Linux platforms arising from networked and system operations. Vulnerabilities and weaknesses of common services are discussed and solutions and workarounds are proposed. Programmed threats and denial of service attacks and their sources are examined. Detect, neutralize, and recover from security breaches. Shell programming to simulate attacks of vulnerable network services. CSU

**CS 270. Computer Architecture with Assembly Language (3)**

Lec-3, conf-1, lab-3

*PREREQ.: CS 110B or 111B.*

This course covers Computer Organization, hardware and software structure, datapath, ALU, register storage, binary representation of data and its conversion, algebra, memory organization, addressing, interrupts and virtual memory. It also compares embedded vs. general purpose systems, CISC vs. RISC architectures and includes an introduction to multiprocessing issues. UC/CSU

**CS ORAX. Oracle and XML (1)**

Lec-1, lab-1 P/NP Available

*PREREQ.: CS 150A, 151A, or 155A*

Introduction to the technologies available in Oracle 10G for working with XML (Extensible Markup Language) data. Explores the differences in working with data in a standard relational database and with XML data. Generation of XML data from relational data; storing XML natively in the database; querying XML data. CSU

**CS ORBX. Oracle Object-Relational Database Concepts (1)**

Lec-1, lab-1 P/NP Available

*PREREQ.: CS 150A or 151A or 155A ADVISE: CS 151P*

Introduction to the object relational database (ORDB) model as implemented by Oracle 10G. Comparison of object types and related object-oriented features such as variable-length arrays and nested table. Creating objects views. Using object type as columns in a table and using pure object tables. CSU

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## Graphic Communications Department

### **GRPH 21. Visual Literacy (3)**

Lec-3, lab-3, field trips

A visual fundamentals course for design and graphic communications students. Study of the principles of visual information organization and sketching techniques for the communication of visual ideas.

Introduction to various techniques for problem-solving UC/CSU

### **GRPH 23. Orientation to Graphics and Multimedia (1)**

Lec-16 (total hrs), field trips

Overview of the Graphic Communications and Multimedia Studies industries and the requirements for programs of study. Lectures provide an overview of the areas of study, transfer options and employment opportunities. Students will identify the necessary skills to succeed in these fields and determine their program of study. CSU

### **GRPH 25. Digital Skills for Visual Media (3)**

Lec-2, lab-4

A foundational hands-on Mac computer class for all graphic communications students. Topics of instruction will include computer hardware and OS software, networks, type and text formatting, raster and vector graphics, time-based media, layout for print and web, and best practices. Topics will be covered through lecture and practical exercises. CSU

### **GRPH 27. Survey of Printing Production (3)**

Lec-2, lab-4, field trips

A technical print production course designed to provide practical laboratory projects in graphic arts paste-up, camera, film assembly and press. Students begin projects in paste-up, using traditional production techniques, and complete them in the press area. CSU

### **GRPH 35. Graphic Design (3)**

Lec-2, lab 4, field trips

*PREREQ.: DSGN 101 or GRPH 21 or ART 125A or IDST 125*

Development of problem-solving and conceptualization skills for graphic design. Exploration of various design principles and their applications. Use of design elements, type and image to communicate effectively to a target audience. UC/CSU

### **GRPH 36. Intermediate Graphic Design (3)**

Lec-2, lab-4, field trips

*PREREQ.: GRPH 35; and 101A*

Continued study of conceptual development, iterative design process, typography and layout for graphic design. CSU

### **GRPH 37. Advanced Graphic Design (3)**

Lec-2, lab-4, field trips

*PREREQ.: GRPH 36*

An advanced graphic design class focusing on the development of a personal voice and conceptual approach to design thinking. Topics include visual language, sequential design, information design and design writing and research. Design process is emphasized. CSU

### **GRPH 40. Digital Printing/Publishing (3)**

Lec-3, lab-3, field trips

A technical course focusing on digital printing and publishing technology using a Xerox Docutech 135 system. Production concepts and practices including job programming, system features, maintenance, workflow management and customer service. CSU

**GRPH 53A. Basic Typography (3)**

Lec-3, lab-1, field trips

*PREREQ.: GRPH 21 or DSGN 101 or MMSP 125 COREQ.: GRPH 101A*

Beginning typography with a study of the history, classification, terminology, and use of type in communications. Students will develop an understanding of type mechanics and design issues through practical exercises and assignments. CSU

**GRPH 53B. Typographic Design (3)**

Lec-3, lab-1, field trips

*PREREQ.: GRPH 53A*

Continued study of typography with emphasis on the development of an awareness of typographic form and structure. The role of typography in communications will be explored through practical exercises in typesetting and typographic design. CSU

**GRPH 60. Product Finishing (2)**

Lec-1.5, lab-1.5, field trips P/NP Available

*ADVISE: GRPH 72A or 40*

A survey and analysis of commercial finishing techniques currently used in print and design production with instruction and practice operating machinery including paper drills/stitchers, cutters, folders, packaging equipment and online finishing systems. Instruction on paper stocks, book imposition, specialty finishing and quality control assessment. CSU

**GRPH 68. Design Studio Practicum (3)**

Lab-8

*PREREQ.: GRPH 35, 53A, 98A, 100A and 101A*

*Repeat: max. 9 units*

A special production laboratory in which advanced students use skills and techniques they have learned in previous courses. Production jobs will range from concept development through design, illustration, typesetting, pasteup, and film assembly, using traditional and electronic tools. CSU

**GRPH 78. Scanning and Correction (2)**

Lec-2, lab-1

*PREREQ.: GRPH 25 or MMSP 120 COREQ: GRPH 27*

course covering the theory and practice of scanning and correcting digital imagery for use in commercial printing processes. Line art, gray scale, duotone and process color will be covered. CSU

**GRPH 98A. Beginning Adobe Photoshop (3)**

Lec-3, lab-1

*PREREQ.: GRPH 25 or MMSP 120*

Intensive hands-on course using Adobe Photoshop. A broad understanding of raster image creation and editing is achieved through in-class projects. CSU

**GRPH 98B. Advanced Adobe Photoshop (3)**

Lec-3, lab-1

*PREREQ.: GRPH 98A*

An advanced, hands-on course in Adobe Photoshop. Creative projects are used to help students develop an understanding of Photoshop as a design tool. CSU

**GRPH 100A. Beginning Adobe Illustrator (3)**

Lec-3, lab-1

*PREREQ.: GRPH 25 or MMSP 120 COREQ: GRPH 27*

An introductory course in Adobe Illustrator, covering concepts of vector-based graphics creation. Students reproduce existing images to learn the various tools available within the application. Accuracy and control of Bezier curves is emphasized. CSU

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**GRPH 100B. Advanced Adobe Illustrator (3)**

Lec-3, lab-1

*PREREQ.: GRPH 100A*

An advanced course in Adobe Illustrator. Creative projects are used to help students to develop a deeper understanding of Illustrator as a design tool. CSU

**GRPH 101A. Beginning Adobe InDesign (3)**

*PREREQ.: GRPH 25 or MMSP 120. ADVISE: GRPH 27 or GRPH 98A or GRPH 100A*

An introduction to page layout using Adobe InDesign. Topics include typesetting and text handling, placing and manipulating images, combining type and images, creating objects, using styles for formatting text and objects, creating and applying color, packaging and printing files. CSU

**GRPH 101B. Advanced Adobe InDesign (3)**

Lec-3, lab-1

*PREREQ.: GRPH 101A*

Continued study and use of Adobe InDesign for print; advanced typesetting, creating and applying grids in single and multi-page documents, in depth use of master pages and styles, tables, transparency, books, imposition, preflight, packaging, and output. CSU

**GRPH 110A. Beginning Digital Illustration (3)**

Lec-3, lab-3 P/NP Available

*PREREQ.: GRPH 100A, 98A, ART 130A ADVISE: DSGN 110*

*Repeat: max. 6 units*

This course covers techniques in Adobe Photoshop and Adobe Illustrator for illustrators. While gaining technical knowledge, students will also begin to explore stylistic options and build a body of work. Sketching and other techniques for developing concepts are also covered. UC/CSU

**GRPH 110B. Advanced Digital Illustration (3)**

Lec-3, lab-3 P/NP Available

An advanced course in digital illustration focusing on the development of conceptual and narrative skills as they apply to a range of illustration projects. CSU

**GRPH 112. Digital Illustration for Fashion (3)**

Lec-3, lab-1, field trips P/NP Available

*PREREQ.: GRPH 25 and FASH 35B*

*Repeat: max. 6 units*

This course covers techniques in Adobe Photoshop and Illustrator for Fashion Designers. CSU

**GRPH 118. Digital Illustration Portfolio (2)**

Lec-2 P/NP Available

A course in portfolio development, copyright law and professional practices for aspiring digital illustrators. CSU

**GRPH 133. Visual Communication - Animation (3)**

Lec-3, lab-1

*PREREQ.: GRPH 25 or ART 125A or IDST 125; and GRPH 25 or IDST 120 ADVISE: GRPH 100A and 98A*

The theory and methods of communicating through animation for new media. Character development and storyboarding will be emphasized. Students will be introduced to simple animation on the computer via animated GIFs and software such as Macromedia Flash. CSU

**GRPH 140. Design for Interactive Media (3)**

Lec-3, lab-3, field trips

*PREREQ.: GRPH 35 and MMSP 130*

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A graphic course focusing on interactive media products. Topics of study include information architecture, interface and user considerations, content/structure relationships, and visual design for computer and mobile devices. Students will research and design solutions for various interactive products. CSU

**GRPH 145. Publishing for New Media (3)**

Lec-3, lab-3, field trips

*PREREQ.: GRPH 35 AND EITHER MMSP 120 OR GRPH 25*

The design process for World Wide Web publishing. Analysis of the principles of print publishing as applied to the Web. Technical topics include bandwidth, graphic formats, type, and color. Design and maintenance of a Web publication as an ongoing project. CSU

**GRPH 147. Adobe Acrobat (1)**

Lec-1, lab-1

*PREREQ.: GRPH 25 or MMSP 120*

Use of Adobe Acrobat to transform computer-generated documents into a portable document format that can be viewed and printed from any type of computer. Emphasis is placed on creating files that print accurately. CSU

**GRPH 148. Professional Practice (2)**

Lec-2, field trips

*PREREQ.: Successful completion of three semesters of study in the Graphic Communications Department*

Advanced course focusing on graphic design professional practices: resumé and portfolio development, freelancing and small business issues, fees, contracts, taxes, copyright, helpful resources and other related topics CSU

**GRPH 149. Portfolio Development (2)**

Lec-2

Portfolio development for graphic design and production art. The course will cover design strategies, format options, and editing and sequencing for print and interactive media. CSU

**GRPH 151. Lettering and Type (1)**

Lec-1, lab-1, field trips

*PREREQ.: GRPH 21. ADVISE: GRPH 53A.*

*Repeat: max. 2 units*

Instruction in hand lettering with an emphasis on the relationship between calligraphy and type design. Study of and practice in various lettering styles and techniques; creative exercises in letterform design. CSU

**GRPH 152. Digital Font Creation (1)**

Lec-1, lab-1, field trips

*PREREQ.: GRPH 21, 100A. ADVISE: GRPH 78, 53A, 151.*

Hands-on experience in creating fonts for the Macintosh computer. Practice in all the digital aspects of the process from concept to execution. Discussion of standards, uses and techniques of type design, and of the current state of the industry. CSU

**GRPH 153. Book Structures, Boxes & Bindings (2)**

Lec-2, lab-1, field trips

*Repeat max.: 8 units*

An introduction to the various practical methods of contemporary book design and production within a context of the historical development of book structures CSU

**GRPH 154. Hand Printed Book Design & Production (3)**

Lec-2, lab-4

*Repeat.: max. 9 units*

The bookmaking process focusing on the design of pages using fine art printmaking combined with letterpress and digital typesetting technologies. Participation in the bookmaking process as author, illustrator, and publisher. Research on the history of the book and an examination of the book arts community in San Francisco and beyond. CSU

*GRPH 154 = ART 154*

**GRPH 155. Bookbinding (3)**

Lec-2, lab-4

*Repeat: max. 9 units*

Study and practice of bookbinding. First: basic structures and craftsmanship. Second: innovative bindings and conservation techniques. CSU

*GRPH 155 = ART 155*

**GRPH 197. Graphic Design Work Experience/Internship (1)**

Work-5

*PREREQ.: GRPH 53B and 36. COREQ.: Enrollment in at least 7 units of coursework including this course and consent of instructor*

*Repeat: max. 2 units*

Application of graphic design skills and development of proficiency in a supervised work environment.

CSU

**GRPH 198. Production Art Work Experience/Internship (1)**

Work-5

*PREREQ.: GRPH 53A, 98A, 99A, and 100A COREQ.: Enrollment in at least 7 units of coursework including this course and consent of instructor*

*Repeat: max. 2 units*

Application of production art skills and development of proficiency in a supervised work environment.

CSU

**GRPH 199. Print Production Work Experience/Internship (1)**

Work-5

*PREREQ.: GRPH 25 and 40 or 72A COREQ.: Enrollment in at least 7 units of coursework including this course and consent of instructor ADVISE: GRPH 60, 67*

*Repeat: max. 2 units*

Application of print production skills and development of proficiency in a supervised work environment.

CSU

**Game Design and Development Program**

**GAME 100. Exploring Game Worlds (3)**

Lec-3, lab-1, field trips P/NP Available

An introduction to the history and status of interactive games. Students examine games as an art form and as part of an ever-growing industry. Includes an introduction to the career opportunities in the game industry. Students will learn how individual games are made, distributed and sold. CSU

**GAME 130. Game Production Workflow (3)**

Lec-3, lab-1 P/NP Available

*PREREQ.: GAME 100 COREQ.: MMSP 147 ADVISE: MMSP 148*

This course develops fundamental skills in production and project management for interactive games. This course will explore the process of game production through designing, scheduling and creating an original playable prototype in a 3D game engine. Students will design independently and as part of a team. UC/CSU

**GAME 140. Team Production of Games (3)**

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Lecture-3, lab-3 P/NP Available

*PREREQ.: GAME 130 ADVISE: MMSP 148*

This course provides students with the experience of working in a videogame development team. It enables students to understand the collaborative model employed in the commercial videogame production environment where different departments each bring special skill-sets to a single product. CSU

### **GAME 150. Career Planning and Portfolio Development (3)**

Lec-3, lab-1, field trips P/NP Available

*PREREQ.: GAME 130*

Development of a portfolio for employment in an entry-level position as a designer or producer in the interactive game industry. This course will include resumé writing, demo reels, design documents, informational interviewing, licensing issues and other topics based on students' particular track and special interests within the industry. CSU

## **Multimedia Program**

### **MMSP 110. Orientation to Graphics and Multimedia (1)**

Lec-16 (total hrs), field trips

Overview of the Graphic Communications and Multimedia Studies industries and the requirements for programs of study. Lectors provide an overview of the areas of study, transfer options and employment opportunities. Students will identify the necessary skills to succeed in these fields and determine their program of study. CSU

*MMSP 110=GRPH 23*

### **MMSP 115. Multimedia Skills and Careers (2)**

Lec-1, lab-3, field trips Skills-based computer class. Hardware and software issues, including system and application software on the Macintosh, cross platform issues and job search skills. Topics include: computer setup, word processing, graphics, scanning, web page production, resumé writing, interviewing and educational planning. Guest speakers. CSU

### **MMSP 120. Computer Skills for Multimedia (3)**

Lec-2, lab-4 P/NP Available

A hands-on computer class for multimedia students covering multimedia hardware and software on the Macintosh. Topics of instruction include: basic internet use, vector and bitmap software, basic animation, basic image-editing, sound and video editing, fonts and font management, file preparation for multimedia output, peripheral hardware set-up and cross platform issues. CSU

### **MMSP 125. Multimedia Content and Form (3)**

Lec-3, lab-3, field trips P/NP Available

*ADVISE: Completion of or concurrent enrollment in MMSP 120 or GRPH 25*

Understanding of content and visual form through the exploration of the fundamental design process as it pertains to the creation of multimedia products and titles. Function and importance of visual elements and design principles will be explored through handcrafted and computer exercises and projects. A survey of multimedia and its artistic and cultural relevancy will also be covered through lectures and student presentations. UC/CSU

### **MMSP 130. Multimedia Process and Production (3)**

Lec-3, lab-3 P/NP Available

*PREREQ.: MMSP 120 or GRPH 25 ADVISE: MMSP 125*

Overview of web development, planning and production through a hands-on approach. Topics include: multimedia planning, budget development, creating wireframes and design, production and marketing techniques for a web site. Assignments will focus on preproduction planning and production of a web site. CSU

**MMSP 131. Social Media for Professionals (3)**

Lec-3 P/NP Available

*PREREQ.: MMSP 120 or GRPH 25 or BCST 119 ADVISE: MMSP 130 and CNIT 129*

This course teaches students how to use online social media tools such as Facebook, Twitter, LinkedIn and YouTube to develop, integrate and leverage online social networks. Students learn how to set up a professional media campaign as they engage clients with these tools. Students also critique current social media practices. CSU

**MMSP 132. Digital Media Distribution (2)**

Lec-2, lab-1 P/NP Available

*PREREQ.: MMSP 120 or BCST 119*

*Repeat: max. 4 units*

Students learn the tools necessary to create, manipulate, and distribute rich media over the Internet. The course provides an introduction to preparing and compressing rich media files using various programs and applications, including Audacity, QuickTime, Windows Media, Real Player and Flash. CSU

**MMSP 133. DVD Authoring (3)**

Lec-3, lab-3 P/NP Available

*PREREQ.: MMSP 120 or BCST 119 COREQ.: BCST 143 or 144 or CINE 56 ADVISE: MMSP 125 or GRPH 21 or DSGN 101.*

The study of DVD authoring with emphasis on planning, designing and production through a hands-on approach. Topics include an overview of DVD technology, storyboarding, flowcharting, gathering and creating assets, encoding and integration of time-based media (including digital video and audio), interface design and final DVD production. Students take their own DVD projects through each stage from pre-production to final production. CSU

**MMSP 135A. Web Design with Dreamweaver (3)**

Lec-3, lab-1 P/NP Available

*PREREQ.: MMSP 130 ADVISE: MMSP 125*

Advanced design for the World Wide Web using Dreamweaver. Topics include separating markup, presentation, and content. Dreamweaver's support for Section 508, production of accessible web sites, and using Cascading Style Sheets are also covered. CSU

**MMSP 135B. Advanced Web Design with Dreamweaver (3)**

Lec-3, lab-1 P/NP Available

*PREREQ.: MMSP 135A*

Overview of advanced multimedia production for the World Wide Web using Dreamweaver. Topics include static versus dynamic websites, database-driven websites, creating and styling dynamic web pages, and standards-based web production. CSU

**MMSP 140. Flash Essentials (3)**

Lec-3, lab-1 P/NP Available

*PREREQ.: GRPH 25 or MMSP 120*

This class covers the essential features of Adobe Flash, including drawing, animation, sound and interactivity using beginning ActionScript 3.0. This course prepares students for advanced multimedia classes in 2D animation. Flash web design and Flash game development. CSU

**MMSP 145. Storytelling & Storyboarding for New Media (3)**

Lec-3, lab-1, field trips P/NP Available

*PREREQ.: ART 125A or 130A or MMSP 125 or GRPH 21*

This course is designed to aid the multimedia student in the generation and development of content for their multimedia projects. Referencing and using traditional storytelling methods, personal writing, script writing techniques and performance exercises in and outside of the classroom, the student will explore multiple ways to generate and script content. Emphasis put on development of skills and techniques of storyboarding. CSU

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**MMSP 146. 2D Animation with Flash (3)**

Lec-2, lab-4, field trips P/NP Available

*PREREQ.: MMSP 140 or CS 183A ADVISE: ART 130A or ART 132A*

Introduction to 2D animation from concept to finished project. Areas covered include historical perspective, overview of the industry, principles of animation, animation process, narrative development, story boarding, character development, 2D drawing and animation skills for use in creating 2D animation with Adobe Flash. CSU

*Not open to students who have successfully completed IDST 155*

**MMSP 147. Imaging with 3D Studio Max (3)**

Lec-2, lab-4, field trips P/NP Available

*PREREQ.: MMSP 120 or GRPH 25; and MMSP 125 or ART 130A*

*Repeat: max. 9 units*

An introduction to techniques used in 3D modeling and imaging. An overview of the 3D industry, as well as the specific tools and techniques used in multimedia. CSU

**MMSP 148. Game Design for Multimedia (3)**

Lec-1, lab-3 P/NP Available

*PREREQ.: MMSP 140 or CS 183A COREQ.: MMSP 146 ADVISE: MMSP 147 and CS 183B*

This multimedia course will focus on game design with an emphasis on game history, game genres, character and story development as well as level and interaction design. A final game prototype will be created either as a paper prototype or a digital game beta with implemented interactivity. CSU

**MMSP 150. Advanced Multimedia Production (3)**

Lec-1, lab-7 (studio) P/NP Available

*PREREQ.: MMSP 135A*

An advanced multimedia production course, allowing students to develop their skills in a team-based environment. Students will design, prepare and produce a multimedia project. CSU

**MMSP 151. Independent Multimedia Projects (2)**

Ind st-10 P/NP Available

*PREREQ.: MMSP 125 and 130 or demonstration of exit skills*

*Repeat: max. 4 units*

Students develop projects defined by CCSF client and instructor. Typical projects include a CCSF departmental web site, marketing CD-ROM or instructional DVD. CSU

**MMSP 160. Multimedia Internship/Work Experience (2)**

Conf-1, work-7, field trips

*Repeat: max. 8 units*

Work experience as an intern in multimedia development companies throughout the Bay Area. CSU

*This course places advanced-level students into internship*

**MMSP 165. Multimedia Portfolio Development (2)**

Lec-1, lab-3 P/NP Available

*PREREQ.: MMSP 130*

*Repeat: max. 4 units*

Conceptualization and development of a multimedia portfolio for gaining entry-level work in the multimedia industry. Includes resumé writing, interview techniques, contracts, licensing issues, and other areas of professional practice. CSU

## Appendix 7: CBO and Broader Community Fact Sheets

### Community Based Organizations

#### African American Art & Culture Complex

**LOCATION:** 762 Fulton Street, 94102

**SUMMARY:**

The African American Art and Culture Complex (AAACC) is a community-based, 501(c) 3 arts and cultural organization. Their mission is to “empower our community through Afro-centric artistic and cultural expression, mediums, education and programming.” AAACC offers visual and performing arts programs and classes including music, dance, theatre, audio recording, and arts and crafts.

**ENROLLMENT CRITERIA:**

The program is open to students, ages 13-17.

**TRAINING/CLASSES:**

Project Level is a free, theme-based program that allows high school students to learn about the music industry and obtain skills to use in the workplace or through entrepreneurship. Participants learn professional techniques for mixing, mastering and engineering various musical compositions. The curriculum includes use of quality equipment with music industry software including Reasons, Garage band, and Pro Tools. Song writing and song arrangement techniques are developed for the purpose of engineering original music.

**PATHWAY:**

Classes prepare high school students to continue their studies to become Web Designers, Graphic Designers, Motion Graphics Designers, Visual Designers, Imaging Specialists, Art Directors, Producers, and Creative Directors.

**CONTACT INFORMATION:** Nicola Figgins - [nicola@aaacc.org](mailto:nicola@aaacc.org)  
415-921-8382

## Arriba Juntos

**LOCATION:** 1850 Mission Street, San Francisco, CA 94103

### **SUMMARY:**

Arriba Juntos provides educational and employment programs on a citywide basis serving many neighborhoods and many different ethnic groups and cultures. They provide wrap-around occupational training programs and employment services that help underserved individuals improve the quality of their lives and contribute to the local economy. All training programs integrate intensive case management, job placement activities, job retention services and a life skills/work readiness component meant to provide participants with a comprehensive array of skills and tools to help them transition to sustain economic independence.

### **ENROLLMENT CRITERIA:**

- Homeless heads of household lacking marketable job skills
- Chronically underemployed and unemployed individuals
- Long-term welfare recipients
- High school dropouts
- Domestic violence victims
- Individuals with limited English-speaking skills
- Children who are two or more grades behind in school
- Youth involved in the foster, and juvenile justice systems
- At-risk and high-risk youth.

### **TRAINING/CLASSES:**

**The Automated Office Skills Training (AOST)** computer program prepares students for employment in a computerized office environment, incorporating work readiness skills, classroom instruction, and internship opportunities. The skills and knowledge acquired through the AOST computer program provide not only basic qualifications for employment in computerized offices, but knowledge applicable to full participation in the competitive workforce. The AOST program is accredited by the Bureau for Private Postsecondary Education.

**Introduction to Computers in Spanish** is a computer skills program in Spanish that includes basics of computer operation, word processing, spreadsheets, web navigation, and e-mail. It provides a vocational angle, using resume creation and job-related web searches to prepare students to find employment.

**Certification:** Arriba Juntos serves as a Microsoft Authorized Testing center for the Microsoft Office Specialist Certification (MOSC), the only Microsoft approved program certifying proficiency in Microsoft Office desktop applications. This certification can be a valuable asset in any job search or career advancement.

### **PARTNERSHIPS/COLLABORATIONS:**

The English as a Second Language/Vocational Immersion Program (ESL/VIP) is a joint program of the San Francisco Department of Human Services (DHS), City College of San Francisco (CCSF), Arriba Juntos, and Catholic Charities that began in 2000. The goal of the program is to offer intensive vocational English as a Second Language (ESL) instruction and workplace culture

to CalWORKS and PAES participants in order to obtain, and advance in, employment. Arriba Juntos offers individualized, culturally sensitive case management services and placement assistance to VIP participants.

The Homeless Employment Collaborative (HEC) is a collaborative of ten community-based nonprofit organizations. The purpose of each HEC agency is to provide comprehensive and coordinated job training and placement programs for the City's homeless population. As part of HEC, Arriba Juntos offers the Automated Office Skills computer training and job placement. The collaborative consists of Arriba Juntos, Catholic Charities, Central City Hospitality House, Community Housing Partnership, Episcopal Community Services Skills Center, Goodwill Industries, Mission Hiring Hall, Northern California Service League, Swords to Plowshares, and Toolworks, Inc.

**CONTACT INFORMATION:** Patricia Melgar, Training Programs Coordinator  
(415) 487-3240, [info@arribajuntos.org](mailto:info@arribajuntos.org)



## Aspiranet

**LOCATION:** 3925 Noriega Street, 94122

**SUMMARY:**

A nonprofit 501(c)(3) community-based organization headquartered in South San Francisco, Aspiranet offers a statewide network of innovative and multi-faceted services that enhance the lives of over 10,000 families each year. Aspiranet provides the following programs in San Francisco:

**SUNSET NEIGHBORHOOD BEACON CENTER**

SNBC offers daily afterschool and evening programs in English and Chinese that provide additional academic support, including digital arts and media programs for youth. The SNBC assists over 1,200 youth a year.

**ENROLLMENT CRITERIA:**

Elementary school through senior citizens

**TRAINING/CLASSES:**

SCREAM (Sunset Creators Reaching Every Able Mind) is a youth filmmaking program, which offers teens the chance to learn and work with digital media production. Youth are trained in the technical art of filmmaking and learn to develop, write, and produce original films.

**CONTACT INFORMATION:** Carol Hill, [chill@ymcasf.org](mailto:chill@ymcasf.org)  
415.469.4550 ext. 13253

**MOUSE SQUAD OF CALIFORNIA STUDENT TECH LEADERSHIP**

MOUSE Squad Student Tech Leadership enables upper elementary, middle, and high school students to learn information technology, customer service, communication, and leadership skills while providing a service to their schools.

The core elements of the program include:

- Online curriculum with computer, software, troubleshooting, and problem solving modules;
- Hands-on activities and performance-based assessments;
- Student-run help desk with paper and/or online ticket management systems.

**ENROLLMENT CRITERIA:** 12-18

**LOCATIONS USING MOUSE SQUAD PROGRAM:** Balboa High, Booker T. Washington CSC, Claire Lilienthal Alternative, Everett Middle School, French American International School, Horace Mann Academic Middle School, Ida B. Wells High, ML King Academic Middle School, Paul Revere School, RL Stevenson Elementary, Sunset Neighborhood Beacon Center at AP Giannini Middle School, Sanchez Academic Preparatory

<http://ca.mousesquad.org/>

**CONTACT INFORMATION:** Jan Half, MSCA Program Director, [director@ca.mousesquad.org](mailto:director@ca.mousesquad.org)

## **Bay Area Community Resources - CHALK (Communities in Harmony Advocating for Learning and Kids)**

**LOCATION:** 965 Mission Street, Suite 520, 94103

**SUMMARY:**

CHALK is a San Francisco project providing a range of youth services with a specific focus on transformative youth development and employment. The purpose of all of their programs is *to* provide information, resources and support to youth and their allies. CHALK is unique because the providers are youth.

**ENROLLMENT CRITERIA:** 14-24 years old

**TRAINING/CLASSES:**

CHALK places youth on the front lines as service providers to their peers and provides them with over 100 hours of paid job and life skills training. Youth are entrusted with high levels of responsibility and provide a foundation of professional and emotional support.

In partnership with BAVC Channels 76 & 29, CHALK airs a youth run show called YouthLine Live twice a month. Each episode is focused on a youth issue; such as violence, tattoos, sex, and more. Professionals and experienced youth on each topic are guests on the show and viewers call in to ask questions and learn more. Currently, the show has more than 10,000 San Francisco viewers.

YouthLine designs and maintains the YouthLine website, CHALK website, YFYI website and each YL hosts individual webpages and the Youtube channel. They also monitor the YouthLine Forum and Database so that all information is updated as soon as possible. YouthLine Online provides information on issues that concern youth, providing information on resources for youth, such as, information on shelters, jobs, health clinics and much more.

**CONTACT INFORMATION:** Ruth Barajas Cardona, Program Director  
ruth@chalk.org

## Bay Area Video Coalition (BAVC)

**LOCATIONS:** 2727 Mariposa, 2nd Floor, San Francisco, CA 94122

### **SUMMARY:**

Next Gen (also called Digital Pathways) provides comprehensive, free, year-long training for up to 100 low-income, underrepresented Bay Area youth and young adults (14-24) annually. Next Gen offers a full year program of training in the digital media arts (sound/audio, video, coding) where students meet twice a week from Oct - May and then enter a paid summer internship within the industry. Throughout the year, the program provides monthly career readiness workshops, panels, guest speakers, and field trips.

All Next Gen participants are sent information about certificates offered at City College so that they can continue building their pathway in media/tech fields. Department chairs help by identifying ways to expedite the certificate track for BAVC graduates; and to partner on panels and events that can encourage students to track into CCSF and complete post-secondary work.

Next Gen creates a pathway to postsecondary opportunities and the workforce for youth facing barriers to education and employment through two program streams: TRACKS and BRIDGES.

1. **TRACKS:** Students complete 120 hours of media-arts learning that culminates in the production of professional portfolios and paid summer internships (\$500+) working in the industry. Under the instruction of award-winning filmmakers, coders and practicing artists and musicians, students develop their artistic voices while gaining critical job readiness and interpersonal skills.
2. **BRIDGES:** Next Gen alumni can now apply for a new program called Bridges, where students join for the monthly workshops and panels but do not receive weekly media training. They receive longer paid summer internships as well as an additional layer of college preparedness/retention where their parents are invited to join/support. Bridges provides mentorship, career skills training, and family engagement events. Graduates have an opportunity to return as paid mentors in the fall.

### **ENROLLMENT CRITERIA:**

The program is open to students, ages 12-24.

### **CERTIFICATION PROGRAMS:**

Certificate programs are primarily for adults but youth can enroll in certificate and internship programs at a reduced price through TechSF. Certificate programs include Graphic & Web Design, Web Development, Video Production, Video Postproduction, 3D Graphics & Effects, and Motion Graphics. Certificates range in price from \$1,600-\$6,000. Certificate programs include Graphic & Web Design, Web Development, Video Production, Video Postproduction, 3D Graphics & Effects, and Motion Graphics. Certificates range in price from \$1,600-\$6,000.

### **PATHWAYS:**

CCSF Pathways for BAVC students who graduated from:

**3D Gaming & Animation:** Students can test out of the third semester Game Production class and/or Game Worlds in Multimedia Studies for the course work they completed. Students can

*Pathways to ICT Education and Careers in San Francisco*

also enroll at CCSF in the Multimedia Studies Department for their Interactive Game Design and Production Certificate, Animation Certificate, or Flash Design and Development.

**Coding:** Students may be able to have their course count in the **Computer Networking + Information Technology Department**. The Computer Networking and Information Technology (CNIT) Department prepares students to seek employment in entry-level network administration, computer technical support, and web development positions.

The two most relevant certificate programs in the **Computer Studies Department** that synch up with Next Gen Open Source are:

**LAMP Fundamentals Certificate**

CS 111A Intro to Programming: .....	3
CS 111B Programming Fundamentals: Java .....	3
CS 111C Data Structures and Algorithms: Java.....	3
CS 160A Introduction to Unix/Linux .....	2
CS 211S Advanced Java: Standard Edition .....	3
CS 150A Intro to Databases Using T-SQL or CS 151A Oracle SQL Databases or CS 155A MySQL Databases or CS 211E Adv Java: Enterprise Edition .....	3
Total Units.....	17

**Computer Programming Java Certificate**

CS 111A Intro to Programming: Java .....	3
CS 111B Programming Fundamentals: Java .....	3
CS 111C Data Structures and Algorithms: Java.....	3
CS 160A Introduction to Unix/Linux .....	2
CS 211S Advanced Java: Standard Edition.....	3
CS 150A Intro to Databases Using T-SQL or CS 151A Oracle SQL Databases or CS 155A MySQL Databases or CS 211E Adv Java: Enterprise Edition .....	3
Total Units.....	17

**Audio Production:**

Students may be able to have their course count in the **Music Department** (for Electronic music) - details forthcoming.

**Broadcast Electronic Media Arts Department:** Viable next steps are to register/enroll at City College of San Francisco for the *Live Sound Certificate* or *Sound Recording Certificate*. Each certificate program requires the class BCST 120 Audio Production. Classes are as follows:

*Live Sound Certificate*

First semester

- BCST 119 Digital Media Skills
- BCST 120 Audio Production
- BCST 145 Field Video Production

Second semester

BCST 124 Digital Audio Production  
BCST 128 Sound Reinforcement  
BCST 160/165 College/Industry Internship

*Sound Recording Certificate*

First semester

BCST 119 Digital Media Skills  
BCST 120 Audio Production

Second semester

BCST 124 Digital Audio Production  
BCST 125 Sound Recording Studio  
BCST 160/165 College/Industry Internship

**Video Production**

*Video Post Production Certificate*

First semester

BCST 119 Digital Media Skills  
BCST 145 Field Video Productions

Second semester

BCST 143 Digital Video Editing  
BCST 144 Digital Video Editing - Final Cut Pro

Third semester

BCST 147 Video Post-production  
BCST 160/165 College/Industry Internship

*Video Production and Editing Certificate*

First semester

BCST 100 Intro to BCST Electronic Media  
BCST 119 Digital Media Skills  
BCST 140 Studio Video Production or BCST 145 Field Video Production

Second semester

BCST 110 Writing for Broadcast Electronic Media  
BCST 143 Digital Video Editing  
BCST 160/165 College/Industry Internship

**Broadcast Electronic Media Arts**

Some relevant courses that Audio/Video tracks touch upon in BEMA include:

BCST 100 Intro to Electronic Media  
BCST 119 Digital Media Skills  
BCST 120 Audio Production  
BCST 140 Studio Video Production  
BCST 144 Digital Video Editing - FCP

There are two directions stemming from Audio Production 120:

1. 124 Digital Audio and 125 Multi-Track Recording which then leads to Digital Audio then leads to Sound for Film and Game Audio
2. Multi-Track Recording which leads to Live Sound and Advanced Multi-Track Recording

**Adobe Youth Voices (AYV)** is designed to capitalize on young people's innate optimism and sense of justice, helping transform disengaged youth into creative and articulate contributors to their communities. Educators participating in AYV Core Training will receive tools and techniques for facilitating youth-centered learning experiences that help students tackle the issues that impact their daily lives. Topics covered in this exciting, empowering 5-day training include:

- Youth Media Theory & Practice
- Media Literacy
- Youth Centered Instruction
- Thinking About Audience
- Critical Response
- Community Collaboration
- Copyright & Fair Use

Participants are introduced to the basics of Adobe Photoshop Elements and Premiere Elements and eligible to receive a donation of this powerful media creation software for their schools or organizations.

**Bump Records:** Bay Unity Music Project (BUMP) Records is an after-school music performance and production program for Bay Area youth ages 14-19.

**The Factory:** BAVC's after-school advanced video production collective for motivated youth, ages 15-19, in the Oakland Bay Area.

**Digital Pathways:** An intensive, after-school media training program for young people who want to learn skills to advance their potential for careers in technology and the media arts. Students choose from 4 tracks - video, audio, 3D gaming & animation, or open source - and participate in intensive training that leads to a portfolio of projects, and paid internships in their chosen field.

**PATHWAY:**

BAVC's pathway model helps youth pursue new education and employment opportunities while using media as a tool for self-expression and discovery.

**CONTACT INFORMATION:** Ingrid Dahl - [ingrid@bavc.org](mailto:ingrid@bavc.org)

## BAYCAT

**LOCATION:** 2415 Third Street#230, San Francisco, CA 94107

**SUMMARY:**

Bayview Hunters Point Center for Arts and Technology (BAYCAT) is a non-profit community media producer that educates, empowers and employs underserved youth and adults in the digital media arts. They offer free classes in media and design and students are able to learn professional media applications while discovering their innate artistic abilities through project-based learning and access to the latest digital technology.

**ENROLLMENT CRITERIA:** AGES14-24

**TRAINING/CLASSES:**

**Summer Media Camp:** A free 7-week intensive program in media arts. Topics and content include: filmmaking, documentary, photography, graphic arts, animation, and music production. During the school year, they offer digital filmmaking, animation, and music production. Studio BAYCAT hires BAYCAT graduates to work with professionals to produce effective and engaging marketing materials for clients ranging from small merchants to multinational corporations. There is an Internship Program that provides technical training for aspiring graphic designers and video producers as well as an opportunity to observe and gain hands-on experience in the digital media industry.

**Stop Motion Animation:** Students learn techniques for creating short films including hand-drawn animation, paper cut-outs, and claymation. Students use digital cameras to capture footage and then edit that footage on a computer.

**Digital Animation with Adobe Flash:** Students write and produce original 2D animated shorts and use Adobe's Flash software to bring them to life onscreen and online. They learn the basics of storyboarding, timing, and character design.

**Graphic Design Fundamentals:** This class familiarizes students with the basics of visual communication that are the building blocks of all graphic design. Students learn how to use type and imagery to communicate ideas through logos, posters and other projects. This course teaches hand skills and is a prerequisite for advanced design courses.

**Digital Imaging:** This ten-session class introduces students to two popular and powerful digital imaging software programs: Adobe Photoshop and Adobe Illustrator. Students scan and manipulate images, learn the difference between raster and vector artwork, and gain important skills that can be used in both print and digital media. This class is a prerequisite for advanced design classes.

**Designing for Print:** Students apply the skills they learn in Design Fundamentals and Digital Imaging to create a variety of projects for the printed medium from business cards to book layouts. Prerequisites: Graphic Design Fundamentals and Digital Imaging or permission of instructor.

**Web Design:** Students learn to create graphics, manage files, and post a working site for a local client. Prerequisites: Graphic Design Fundamentals and Digital Imaging or permission of instructor.

**Music Production:** Make beats, record sound and vocals, and digitally edit audio tracks. The class covers musical arrangement, songwriting, and production and students create a final audio CD. The class will also create, perform and produce BAYchat Radio. Students research a topic, write and perform scripts, and conduct interviews while learning digital audio software and editing skills.

**CONTACT INFORMATION:** Brittany Janis, [brittanyjanis@baycat.org](mailto:brittanyjanis@baycat.org)



## Bayview Beacon At Phillip & Sala Burton High School

**LOCATION:** 400 Mansell Street, 94134

**SUMMARY:**

The Bayview Beacon Center, a program of the Bayview YMCA, is located at Phillip & Sala Burton High. Youth programs take place Monday-Friday during Puma Block (2:30pm-6pm). They include the Teen Center, homework help, dance, art, music, leadership, sports, wellness workshops/case management and employment trainings.

**ENROLLMENT CRITERIA:** All Beacon programs and services are free and are open to everyone — especially students, parents and residents of Bayview Hunters Point, the Portola District and Visitacion Valley.

**CONTACT INFORMATION:** Carol R. Hill, Director - [chill@ymcasf.org](mailto:chill@ymcasf.org)

## **Black Girls Code**

### **LOCATION:**

Various locations in San Francisco are used for classes. They have no permanent location.

### **SUMMARY:**

Black Girls Code is a fairly new 501(c) 3 in San Francisco (1 year) that introduces computer coding lessons to young girls from underrepresented communities in programming languages such as Scratch and Ruby on Rails.

### **ENROLLMENT CRITERIA:**

The program is open to girls, ages 13-17.

### **TRAINING/CLASSES:**

The program provides girls with new skills in computer programming, introduces them to role models in the technology world, and builds their confidence to become tech creators and entrepreneurs.

### **PATHWAY:**

By promoting classes and programs the agency hopes to grow the number of women of color working in technology and give underprivileged girls a chance to become the masters of their technological worlds. The program is only 1 year old and students are 12-14, so there are no graduates yet.

**CONTACT INFORMATION:** Kimberly Bryant - kbryant@blackgirlscode.org

## **Booker T. Washington Community Service Center**

**LOCATION:** 800 Presidio Avenue, San Francisco, CA 94162

**SUMMARY:**

Founded in 1919 Booker T has been a place for African American residents in San Francisco to organize and has responded to community needs with job training, after school and teen programs, recreation, emergency food, counsel on housing and health care, senior clubs and other programs.

**ENROLLMENT CRITERIA:**

9-12 grade youth in the 'neighborhood'.

**TRAINING/CLASSES:**

The Youth SF Blog crew learns techniques in journalism, audio and video editing and how to interview, record video and audio. All the learned skills are displayed through the use of social networks such as Twitter, Facebook, Myspace and Blogs in the form of video, interviews, and interactive blog posts.

The Mouse Squad provides youth access to technology education and enables them to learn technology, problem solving, and communication and leadership skills; and provides service learning and tech support.

Participants completing 8 hours of computer training and a skills assessment are given a computer for their household.

**PATHWAY:**

These programs provide youth with technological knowledge and skills as fundamental steps toward their individual self-sufficiency and empowerment. [Same question as above, what's the next step on the path? If the program doesn't make the introduction, then it's safe to say there is no pathway once they complete whatever is offered.] [Again, this may be an awareness opportunity.]

**CONTACT INFORMATION:** Jerry Trotter - [jtrotter@btwsc.org](mailto:jtrotter@btwsc.org), 415-928-6596

## **CAMINOS Pathways Learning Center**

**LOCATION:** 2301 Mission Street, Suite 105, San Francisco, CA 94110

**SUMMARY:**

CAMINOS is a non-profit organization is dedicated to using technology to improve the lives of Latina immigrants. CAMINOS enables women to create opportunities for self and economic improvement through access to technology. Courses are offered in English and Spanish.

**ENROLLMENT CRITERIA:** Latina women, 18+.

**TRAINING/CLASSES:**

**The Basic Computer Class:** Students learn how use to a computer, its parts and components, and how to perform basic tasks. They also learn to use programs typically used in offices including Word, Excel, PowerPoint, and Photoshop. With these skills, they are able to find entry-level office jobs.

**Computer Networking & Information Technology:** a 142 hour course that trains students to install hardware, configure, repair, and maintain a computer system in a typical office environment. Lab time includes a project-oriented hands-on introduction to hardware identification, maintenance, upgrade, diagnosis, and troubleshooting. All students are required to do a two-month 16 hour internship.

**Operating Systems Technology:** a 142 hour course where students learn to select and install software and to diagnose and troubleshoot problems due to software configuration. All students complete a three-month, 24 hour internship.

**Networking and Wireless Networks:** an overview of the major components of a network including network functions and architecture, network operations, network administration and support, larger networks (WANs) and solving network problems. All students complete a three-month, 24 hour internship.

**The Wireless Networks Class:** students learn to design, install, configure, manage, and maintain wireless networks, including: advanced fundamentals of wireless communication, current and developing standards and protocols, boosting signal strength, detecting and extending signals, troubleshooting common problems, monitoring the network, security issues, and research and analysis of proposed and developing security solutions.

[All of the above appear to be immediate opportunities for pathways and possible dual enrollment for CCSF certificates and programs]

**PATHWAY:** These programs provide women with technological knowledge and skills to secure living wage (or better) jobs.

**CONTACT INFORMATION:** Shirin Dewani Belur

## **Chevron Corp Teen Center at the San Francisco Public Library**

**LOCATION:** 100 Larkin Street, San Francisco, CA 94102

**SUMMARY:**

SFPL provides a variety of free computing classes to aid in the use of Library and Web-based resources in 15 locations, including:

- Basic Mouse and Typing skills
- Library Catalog
- Internet 101
- Training for the Internet and Library Catalog

The Library offers desktop and laptop computers that provide access to the Library's catalog and online resources, the Internet, recordings, and office productivity software. Individual stations are designated for teens 13 and up.

All Library computers have Internet Explorer, OpenOffice 3.2, Writer, Calc, Impress, and Adobe Acrobat 9.3.3.

All Desktop computers have a wide variety of programs including:

Microsoft Windows XP w/ SP3, Macromedia Flash Player 10 ActiveX, Macromedia Shockwave Player 11.5, Microsoft Forefront 7, Sun Java 6, and Windows Media Player 11.

The library also offers a bilingual (English/Chinese) after-school teen activity. Workshop activities include: bilingual blog publishing, digital photography, database learning, gaming, and homework help.

**ENROLLMENT CRITERIA:** None

**TRAINING/CLASSES:** NONE

**CONTACT INFORMATION:** 557-4497

## Chinese Community Youth Center (CYC)

**LOCATION:** 1038 Post Street, San Francisco, CA 94124

**SUMMARY:**

CYC encompasses behavioral health, education, intervention, leadership development, street outreach and workforce development in all their programs. Services are directed at responding to the complex set of issues the youth face including acculturation, difficulties in school, economic hardship, substance abuse, and gang involvement.

**ENROLLMENT CRITERIA:** Immigrant Students, Youth -13-18

**TRAINING/CLASSES:**

THE CYC HOSTS THE FOLLOWING PROGRAMS:

**The AT&T Computer Clubhouse & Tech Academy** gives participants the opportunity to become designers and creators of technology. The Clubhouse provides the resources, materials, and tools for young people to develop projects in the following areas: computer simulations, multimedia creations, electronic music, computer game design, electronic publishing, computer-controlled devices, three-dimensional design, and developing World-Wide Web pages.

**Community Technology Youth Crew:** 15 young people are recruited and trained to teach basic computer skills to seniors at five locations in San Francisco. Youth, 16–24, work in teams composed of two high school students and one college student to provide general class oversight as needed. Youth trainers receive service learning credit or a paid stipend for their time.

**Generating Leadership Opportunities in the Workforce (GLOW)** serves youth ages 14-21 who are on probation, or been involved in the juvenile justice system. The program provides job placement and job readiness training, case management, vocational and life skills training, academic assistance and mentoring, education and career counseling, and other wraparound services in an effort to keep youth out of probation and from further involvement with the justice system.

**The Mayor's Youth Employment and Education Program (MYEEP)** leverages the desire of young people in 9th&10th grade to be employed to engage them in job readiness training, youth development, and educational activities. In addition to work experience, the program provides support to youth as they transition towards successful adulthood by strengthening their understanding of the connection between employment and education as well as the responsibility of adults to contribute positively to society.

**Summer Youth Employment Program** targets services for low income youth ages 16-24 involved in the justice system or not on track to graduate from high school. The program includes job placement and readiness training, academic assistance, case management and other support. Youth are also provided with guidance and assistance to transition to secondary education or career options.

**Youth Employment and Training Project (YETP)** provides job readiness and placement services to low-income youth ages 16-25. This project provides supportive services in resume writing, interview preparation and employment counseling, in addition to resources for *Pathways to ICT Education and Careers in San Francisco*

employment. YETP aims to develop job skills while gaining work experience, increase career awareness and employability, and develop successful work habits. Skills trainings and workshops are conducted in partnership with the Employment Training Center where free training courses are provided to aid youth on their road to employability through workshops that include computer programming, career portfolio building, and workplace behaviors.

**Youth Sector Bridge (YSB)** is an OEWD program targets low income youth ages 17-21 who are involved in the justice system, not on track to graduate from high school, or have other barriers to employment. The program provides job placement, job readiness training, paid internships, academic assistance, case management and other support services, and transition to secondary education, career options or a sector academy.

All participants complete a five-hour orientation before being placed at a work site. The orientation prepares youth teams to deliver computer trainings to their own class of 7 to 10 seniors. CTN is also collaborating with MOUSE Squad of California's Student Tech Leadership program to develop participants' project management, teamwork, leadership, and organizational skills. Youth trainers will also attend monthly professional development trainings with the Intergenerational Program Manager for additional support and workshops, including how to get started in an IT career, STEM education, and elder sensitivity trainings.

**PATHWAY:** The program will enhance students' computer literacy and prepare them for a job/internship in the technology field or additional training in college.

**CONTACT INFORMATION:**

MYEEP - Richmond & Sunset Neighborhoods: Chi Hong Leung , Program Manager, 415:752.9675, employment@cycsf.org

MYEEP - Chinatown & North Beach Neighborhoods: Daphne Wong, Project Coordinator, 415: 775- 2636, ext 245

GLOW - Kyle Chan, 415: 775.2636, ext 210

YETP - Tammy Vuong , Employment Counselor, 415:752-9675

YSB - Ryan Leano, 415:752.9675

## Conscious Youth Media Crew

**LOCATION:** 1230 Howard Street, San Francisco, CA 94103

**SUMMARY:**

CYMC's 85 hour multimedia internship program offers an introductory training to digital filmmaking that focuses on producing short films about people doing extraordinary things in our communities. Youth interns use state of the art technology and receive high quality instruction from experienced professionals, artists and community members.

Graduates from the introductory training can also become paid producers on special projects, intern at various field placements in the media industry, and take advantage of college pathway resources, networks and opportunities.

All trainings are led by CYMC Staff and Guest Artists. Youth participants earn academic credit towards graduation through the completion of project requirements.

**ENROLLMENT CRITERIA:** 14-18 years of age

**TRAINING/CLASSES:**

Trainings cover four phases of production where interns learn story development, basic camera operations, basic light & sound techniques; Final Cut Pro advanced editing software, special effects and graphics, and screening and distribution of completed works.

**CONTACT INFORMATION:** Debra Koffler, Executive Director  
[info@cymc415.org](mailto:info@cymc415.org)  
415-621-5353



## Delancy Street Foundation

**LOCATION:** 600 Embarcadero, San Francisco, CA 94107

**SUMMARY:**

Delancy Street is the country's leading residential self-help organization for former substance abusers, ex-convicts, homeless and others who have hit bottom. Residents at Delancy Street range from teenagers to senior citizens, and include men and women and all races and ethnicities. The average resident has been a hard-core drug and alcohol abuser, has been in prison, is unskilled, functionally illiterate, and has a personal history of violence and generations of poverty.

The vocational training schools, managed and taught by residents, are accredited by the State. At the Delancy Street Print and Copy Shop, residents are trained in all aspects of the silk-screening from computer design to the printing of the shirts and clothing.

**ENROLLMENT CRITERIA:** 18 years old or older who meets the entry requirements of the program which usually involves being an ex-offender or as an alternative to incarceration.

**TRAINING/CLASSES:**

Delancy Street provides vocational training programs for 300 formerly unemployable drug addicts, homeless people, and ex-felons. They provide training in purchasing, contracting, computer and accounting services.

**CONTACT INFORMATION:** Craig Miller, [CMiller@LLASF.org](mailto:CMiller@LLASF.org), 415-397-8957

## Horizons Unlimited

**LOCATION:** 440 Potrero Avenue 94110

**SUMMARY:**

Horizons Unlimited is a youth development and empowerment organization rooted in community service and advocacy. Culturally competent and linguistically sensitive programs are driven by the needs of the youth and reflect the diversity of the population served. Horizons' primary goal is to engage, educate, and inspire youth.

**ENROLLMENT CRITERIA:** 14-18 years old, a resident of San Francisco and enrolled in high school or a GED program

**TRAINING/CLASSES:**

**Mayor's Youth Employment and Education Program:** MYEEP aims to develop job skills, provide experiences that increase career awareness and future employability, increase knowledge of educational opportunities and promote community involvement. Youth work up to 10 hours during the school year (October-May) and up to 20 hours during the summer (June-August). Through the MYEEP program, Horizons provides employment and job readiness opportunities to approximately 150 youth per annum.

**New Directions Employment Program:** Horizons is a member of the New Directions Employment Program (NDEP) which is a city-wide employment program that provides comprehensive job training, employment and educational services to 175 San Francisco youth on active probation. The program's structure provides youth with valuable work experience and training that enhances their employability skills and career awareness while supporting their overall development. Youth are placed in subsidized after-school and summer employment opportunities in structured work-based learning opportunities. This experience is supplemented by program activities such as leadership development, community service and educational support.

**CONTACT INFORMATION:** Celina Lucero, Program Director, (415) 487-6715  
celinalucero@hotmail.com

## **Hunters Point Family - Girls 2000**

**LOCATION:** 718 Kirkwood Road, 94124

**SUMMARY:**

GIRLS 2000 is a holistic program designed specifically to meet the needs of girls and their families living in the Hunters Point public housing developments. The underlying philosophy of the program is that all children can succeed if they have the proper tools and guidance. A computer instruction is one of 10 programs offered.

**ENROLLMENT CRITERIA:**

10-18 years old - residents of Hunters Point public housing.

**CONTACT INFORMATION:** Takai Tyler, 415-822-8895

## KQED Youth Radio

**LOCATION:** 1701 Broadway, Oakland, CA 94612

### **SUMMARY:**

The Youth Radio Program is a youth-driven, converged media production company that offers a range of free training opportunities in broadcast journalism, radio, video, music and web production, engineering, media advocacy and literacy. Using new media and technology as a “hook”, the organization provides stable, long-term guidance for youth as they transition from middle to high school, from high school to college, and into meaningful career paths.

### **ENROLLMENT CRITERIA:**

Programs are open to youth ages 14-18, with advanced programs open to young adults up to 24 years of age. High-school youth focus emphasizes girls (55%), low-income youth (80%) and young people of color (80%).

### **TRAINING/CLASSES:**

Current training offerings out of Youth Radio Oakland includes:

Offered quarterly, Core is Youth Radio’s flagship introductory media training program for Bay Area high-school students aged 14-18. Over the course of 11-weeks, participants develop radio and broadcast journalism skills, which include news and commentary writing, PSA production, on-air announcing and interviewing, board operation, and music programming. They also experience music and video production, sound design, and round out their technical experience with intensive media literacy. All Core graduates earn high school credit through a partnership with the local Regional Occupational Program (ROP), while junior and senior Core graduates earn Peralta Community College credit.

Running concurrently each quarter with Core is Youth Radio’s intermediate level media training program, Bridge. Designed for Core graduates, Bridge students continue their radio broadcast skill training through the production of solo shows. They also specialize in a media skill “majoring” in music production and sound design, video production, or journalism.

MATCH (Media Advocates Transforming Community Health) is 6-month intensive health-focused, leadership, education, professional soft skills, and media training designed for Oakland youth aged 14-18 who have recently been released from Alameda County’s Juvenile Justice Center. MATCH graduates are tracked into 3-6 month internship opportunities in Youth Radio’s Health Department as peer health advocates. MATCH is supported through the City of Oakland’s Measure Y Violence Prevention and Safety Funds, and is focused on providing employment opportunities during the after-school hours.

Youth Radio provides a variety of media training workshops to the residents of Camp Wilmont Sweeney. Currently, Youth Radio is piloting an innovative 11-week training focused on utilizing sports media as a means of addressing larger behavior health issues related to manhood, masculinity, violence, and sex.

Graduates of the Bridge and MATCH programs are eligible for Youth Radio’s internships available throughout Youth Radio in the Training, Production, Tech and Engineering, Health, and Administrative Departments. Interns are hired quarterly through a competitive application process.

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EMP (Emerging Media Professionals) is available to former interns, ages 18-24. The EMP Program offers a 6-month employment opportunity youth can enhance their public speaking, group facilitation, community networking, journalism, and media production and distribution skills. A key component of the program is transitioning youth into media education and career paths, by designing individualized action plans that focus on enhanced leadership opportunities.

Youth Radio places select youth alumni into job shadowing and mentorship opportunities at media, communications technology, health, and social justice organizations, in addition to local private and public partners.

For local youth, institutions and community groups, Youth Radio offers media workshops, technical assistance and production services.

**PATHWAYS:**

Youth are prepared for entry-level jobs in the media, and can enter college with work experience and technology training to augment their education.

**CONTACT INFORMATION:**

Xilen Ramirez, Academic Advisor  
xilen@youthradio.org or youthradio@youthradio.org  
510-251-1101

## Larkin Street Youth Services

**LOCATION:** 1154 Sutter Street, 94109

**SUMMARY:**

Larkin Street Youth Services provides homeless, runaway and at-risk youth and young adults with the help they need to rebuild their lives. Each year, more than 3,600 kids seek their help. Staff gives them the support they need to resolve the immediate crises in their lives and take steps toward a brighter future beyond the streets.

**ENROLLMENT CRITERIA:** Ages of 12 and 24, homeless and/or at-risk

**TRAINING/CLASSES:**

**Wire Up** is an intensive 15-hour computer and technology skills course offered to youth in Larkin Street's on-site computer lab. The Wire Up curriculum includes vocational training in basic computer applications and website design and is linked specifically to the skills that businesses in the technology sector say they need most. Wire Up classes run in conjunction with their Job Readiness Class to offer training for an advanced set of technical skills. When youth graduate from Wire Up, they are prepared to formulate their résumés, apply for work, and interview for jobs in the technology sector.

**PATHWAY:** The skills learned increase hiring potential for youth as well as readying them for careers both inside and outside of the local Bay Area technology industry.

**CONTACT INFORMATION:** Toby Eastman, Chief of Programs, 673-0911

## Mission Language & Vocational School

**LOCATION:** 2929 19th Street, San Francisco, CA 94110

**SUMMARY:**

Mission Language & Vocational School, Inc. (MLVS), a 501(c)(3) non-profit located in the Mission District. Each year the school enrolls over 300 students, and more than 80% of graduates continue to be employed after one year.

**ENROLLMENT CRITERIA:** 18+

**TRAINING/CLASSES:**

Medical insurance billing and coding: 9 month curriculum includes Computer classes, in Excel, Medical Billing and Coding (ICD-9 and CPT coding systems), Math and Business English courses. Students learn how to do billing and coding for the medical office and hospital and are placed in a one month externship for work experience.

**Certification:** Individuals receive a Medical Billing and Coding certificate upon completion of the program.

**PATHWAY:** Besides a career in medical billing there are opportunities for graduates to become patient account managers, physician office supervisors, and medical billing audit specialists.

**CONTACT INFORMATION:** Rosario Anaya, Executive Director, [info@mlvs.org](mailto:info@mlvs.org)  
415-648-5220

## **Ninth Street Independent Film Center**

**LOCATION:** 145 Ninth Street, Suite 101, San Francisco, CA 94103

**SUMMARY:**

Ninth Street is a nonprofit media arts center designed to support seven partners. Providing below market rent, and shared resources such as Digital Media Equipment and Information Technology, Ninth Street also creates collaborative program opportunities through exhibitions and youth media education.

**ENROLLMENT CRITERIA:** Middle and high school-aged youth

**TRAINING/CLASSES:**

**TILT (Teaching Inter-media Literacy Tools):** The Ninth Street youth media program, TILT, collaborates with schools, community-based programs, and individual youth to teach young people the fundamentals of moviemaking and media literacy through hands-on training in video production. Through a combination of technical training and hands-on experience, students are encouraged think critically about media and to create their own alternative messages.

**Media Literacy and Video Production Workshops:** Middle and high school youth are introduced to media literacy concepts and the basics of video production in classroom and/or afterschool settings. Participants work collaboratively to discuss media messages, learn camera fundamentals, brainstorm and develop relevant ideas and topics, and create short video pieces (3-5 min). Workshops are 24-hours (12 sessions) that run for 6-12 weeks. The College & Career Planning Program is an opportunity to gain job readiness skills and prepare for advanced education and careers through technology training. Young women work in a computer lab to create a life plan, explore careers and colleges and learn about preparing for a job.

**CONTACT INFORMATION:** Skye Christensen, Executive Director  
415-625-6100



## Oasis for Girls

**LOCATION:** 245 11th Street, 94103

**SUMMARY:**

Oasis for Girls, located in the South of Market neighborhood, provides a safe space where girls and young women are inspired and empowered to become strong and creative leaders in their communities. The program provides culturally relevant and gender specific art and art education, leadership development, and life skills education programs that support the growth of low-income and immigrant girls and young women of color. Through these programs, girls and young women have access to a community of adults who support them in creating change and integrating their skills to address issues they face in their lives and in their communities.

**ENROLLMENT CRITERIA:** Girls/Young women, ages 11-24

**TRAINING/CLASSES:**

Oasis has a limited number of computers and no technology/computer training program. They have basic programs (Microsoft Word, Excel, Power Point) and they would like to establish a computer lab and gain more technology training and computer skills for participants.

**CONTACT INFORMATION:** Jessica Van Tuyl, Executive Director [jvantuyl@sfoasis.org](mailto:jvantuyl@sfoasis.org)

## OUT OF SITE YOUTH ARTS CENTER

**LOCATION:** 29 Howth Street

**SUMMARY:**

Out of Site provides free after school and summer programming in visual and performing arts to public high school students in San Francisco. Out of Site also offers a number of paid internships and other youth leadership opportunities. Students come for a chance to experiment in the arts and a place to be themselves; they find artistic training, new mediums for self-expression and a diverse and supportive community. Out of Site is an independent nonprofit that is located on the campus of Lick-Wilmerding High School, a private school. This partnership enables them to use state-of-the-art facilities, equipment and tools.

The fall and spring session are approximately 12-weeks long and offer a mix of visual and performing arts as well as architecture. Classes meet twice a week, for 2 hours. The paid summer internships offer high school students a chance to experience what it's like to work on a design team. Working with a group of other students, they take on a real-world project and receive a stipend. Students who want to take on greater leadership can work as Teaching Assistants or serve on the Youth Advisory Board.

**ENROLLMENT CRITERIA:** 14-18

**TRAINING/CLASSES/INTERNSHIPS:**

There was a summer 2012 Paid Internship Program for 12 SF public high school students in Website Design/Digital Media. High school students develop an arts and culture website for District 11 where people can go to connect to what's going on in District 11 or to promote their own events and share ideas for creating more arts in the district. Interns work on a team to conduct interviews in the neighborhood and post video content online. As an intern, they have the chance to work on a real website that is used by the San Francisco community while picking up multimedia skills that you can use to create their own projects.

**Pathway:** Interns gain great experience as they enter college or look for other jobs.

**Contact Information:** Beth Rubenstein, Executive Director - [info@outofsite-sf.org](mailto:info@outofsite-sf.org)

## Positive Resource Center

**LOCATION:** 785 Market Street, 10th Floor, 94103

**SUMMARY:**

Positive Resource Center is the only place for people living with or at risk for HIV/AIDS to get comprehensive benefits counseling and employment services in San Francisco. The organization is regarded as the model program in the United States for agencies hoping to offer similar services. PRC was the first agency to assist people living with HIV/AIDS with comprehensive counseling for obtaining essential financial and medical benefits combined with a full spectrum of vocational rehabilitation and employment services. Furthermore, PRC provides training and technical assistance throughout California on complex benefits issues.

**ENROLLMENT CRITERIA:** People living with HIV/AIDS

**TRAINING/CLASSES/INTERNSHIPS:**

**Computer Training Workshops:** Positive Resource Center's Employment Services Program offers a full spectrum of computer training classes, regardless of a client's level of experience. There are classes for beginners to gain basic computer skills and more advanced courses for those with some computer experience who want to improve their skills. Students can choose from half-day classes through the FirstStep series or the NextStep series, a comprehensive six-week Microsoft Office suite training.

The Computer Lab has a full-time Computer Training Coordinator and regularly scheduled training classes in:

Computer Basics

Word Processing with Microsoft Word 2002

Spreadsheets with Microsoft Excel 2003

Database maintenance and development with Microsoft Access 2003

Presentation development with Microsoft PowerPoint 2003

Web Page design

**Contact Information:** Brian Whitford, Computer Training Coordinator, 777-0333

## Visitacion Valley Community Beacon Center

### **LOCATION:**

Visitacion Valley Middle School, 450 Raymond Avenue 94134

### **SUMMARY:**

The Beacon Center is located within the Visitacion Valley Middle School. The Center offers educational, career, leadership, health and arts programs for youth. The Center also houses a computer lab with training classes for adults in the evening as well as on Fridays during the day.

### **ENROLLMENT CRITERIA:** Youth/young adults, ages 14-21

**The Digital Connector Program:** This program is part of the effort to bring digital technology into low-income homes and communities and one site is located at Visitacion Valley's Community Beacon Center. The program prepares youth to provide hands-on technology training and they learn about career development and opportunities through job shadowing, and by visiting such organizations as Google and Yahoo, and schools like San Francisco City College. The laptops they earn during their first year help them in their jobs. The youth (known as Digital Connectors) work in teams in their neighborhood training families on basic computer and Internet usage.

### **TRAINING/CLASSES:**

The youth who comprise Digital Connector teams (which vary in size) come in with a wide range of technical backgrounds; some are extremely knowledgeable about computers, while others have little experience. Young people are taught basic Internet skills, including how to use the local Beehive site (web sites where users can find relevant content, such as local job listings and educational information) and also learn how to take computer hardware apart and reassemble it. Each team's training depends on the project it will be working on. For instance, if a team's job is to build a wireless network at a housing development, members will learn everything they need to know to get it done.

**PATHWAY:** The experience in the program helps prepare youth to enter the working world and /or to go on to college to gain more technology knowledge.

**CONTACT INFORMATION:** Teodora Ildefonso-Olmo, [teodora@rocksf.org](mailto:teodora@rocksf.org)

## Vietnamese Youth Development Center (VYDC)

**LOCATION:** 166 Eddy Street, San Francisco, CA 94102

**SUMMARY:**

The mission of VYDC is to provide direct assistance to Southeast Asian and neighborhood youth by empowering them and their families to participate actively in the development of their community. VYDC's goals are to prepare young people to transition successfully into adulthood. The program provides comprehensive case management, employment, educational services and social enriching activities. VYDC diverts youth from the juvenile justice system into meaningful programs, advocates for the needs of low-income youth in the neighborhood, and develops youth leadership in the Tenderloin community and throughout San Francisco.

**ENROLLMENT CRITERIA:** Youth, ages 14-21 in Civic Center/Tenderloin area

**TRAINING/CLASSES:**

The Digital Media & Arts (DMA) program at VYDC aims to provide dispossessed and disadvantaged youth a means of self-expression and empowerment through digital technology and media. Through the use of the computer technology lab, VYDC helps youth to build confidence and self sufficiency in the areas of education, employment and enhance their digital media literacy. A variety of free classes are offered including: music/audio production, Video Production, graphic arts, animation, website creation, media networking, and web-blogging (blogging). Youth learn computer programs like Microsoft Office Suite, Adobe Creative Suite, and iLife. The program offers job and career counseling, internships, and academic monitoring.

**PATHWAY:**

The program provides at risk youth and young adults the opportunity to learn about digital media arts through hands-on experience by completing a project. Graduates build confidence, self-sufficiency, and have a better vision of their career path. Participants are in high school, in college and/or looking for jobs. Pursuing a career in the field of digital media arts is dependent upon the individual's choice after completion of the program.

**CONTACT INFORMATION:** Yen Dinh, Director of Programs, [yen@vydc.org](mailto:yen@vydc.org)  
415-771-3917

## Young Community Developers

**LOCATION:** 1715 Yosemite Ave 94124

**SUMMARY:**

Young Community Developers, Inc. (YCD) is a community-based organization that provides a variety of training and support opportunities for residents of the Bayview Hunters Point neighborhood of San Francisco. Per year some eighteen hundred individuals (1,800) receive employment and training related services through YCD. The targeted population is among the hardest to serve. Over the years YCD has successfully operated both educational and employment based training opportunities for residents of the Southeast Sector.

**ENROLLMENT CRITERIA:** Ages 14+ (youth and adults)

**TRAINING/CLASSES:**

YCD participants attend Computer Training classes at the BayView YMCA four days a week and at YCD's location on Fridays.

**CONTACT INFORMATION:** Tracey Taper, Program Manager - [ttaper@ycdjobs.org](mailto:ttaper@ycdjobs.org).

## Broader Community Organizations

### BRIDGE TO SUCCESS

#### LOCATION:

#### SUMMARY:

A program of the SF Department of Economic & Workforce Development, the Bridges to Success initiative brings together the City and County of San Francisco, the San Francisco Unified School District (SFUSD), City College of San Francisco (CCSF), and four CBO direct service partners who each have expertise serving targeted youth: the Japanese Community Youth Council Community Youth Center (lead agency), Hunters Point Family, and Jewish Vocational Service (JVS), that have been selected to implement and promote postsecondary success for underrepresented students.

The goals of the partnership are to create shared ownership of the responsibility for postsecondary attainment and to build a coordinated strategy to define on the ground changes needed to make a real difference in the lives of youth. To help achieve these goals, the Youth Data Archive (YDA) provides quantitative research and analytic support to assist partners to make informed policy and/or programmatic changes designed to improve youth outcomes.

Bridges to Success utilizes a service model that blends academic skills support and workforce development to promote school achievement and highlight the relevance of education in accessing career opportunities. Services include: academic and work-readiness assessments, Individualize Service Strategy (ISS) planning, academic and workforce skills enhancement, Science, Technology, Engineering, and/or Mathematics (STEM) related work experience, school reengagement support, and career pathway development.

#### Outcomes:

- 250 youth to receive work experience and academic enrichment services
- 50 out-of-school youth to re-engage with education
- 40 to complete high school diploma or GED
- 150 youth to transition to year-round education and/or workforce development
- 25 youth to enroll in CityBuild Academy (Construction Pre-Apprenticeship)
- 25 youth to enroll in TrainGreenSF Academy
- 50 youth to enroll in Health Sector Academy or Health Sector Bridge Program
- 30% placed in employment, education or training
- 50% receive recognized certificate/diploma/degree
- 50% increase literacy/numeracy

The target is low-income youth between the ages of 16 and 18 who meet one or more of the following criteria: out-of-school; youth not on-track to graduate, foster youth; youth offenders; youth with disabilities.

#### CONTACTS:

Japanese Community Youth Council Community Youth Center - Jon Osaki, Executive Director  
or Julie Matsueda, Deputy Director of Programs - 563-8052  
Hunters Point Family - Takai Tyler, Director - 822-8895  
Jewish Vocational Service - Abby Snay, Executive Director - 391-3600  
Workforce Development Division - 701-4848

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## Career Ladders Project

### LOCATION:

### SUMMARY:

The Career Ladders Project (CLP) works in partnership with California Community Colleges state-wide to provide educational and career advancement opportunities for Californians. The provide research, develop policy initiatives, and provide strategic assistance to colleges and their workforce development partners. The CLP works to strengthen the role of community colleges providing educational & career advancement opportunities. Sites in San Francisco are BAVC, Bayview Hunters Point Center for Arts and Technology, First Place for Youth, and Youth Uprising.

CLP seeks to establish clear pathways from high school to the full range of postsecondary opportunities that are essential to overcoming the structural barriers to educational and career advancement. Working with partners, such as ConnectEd, CLP hopes to improve higher academic achievement, foster more intentional educational and career transitions from high school, improve college retention, and subsequently, improve college and career success. CLP is developing a model design and implementation strategy that will strengthen the connections between high schools with industry-themed pathways and their local community colleges to improve student success in both college and career. Using the California Linked Learning District Initiative as a launching point, CLP will examine the current interest and capacity of neighboring community colleges to partner with those districts to align and extend Linked Learning pathways into the community colleges and other postsecondary institutions. This planning phase will lead to a demonstration project designed to extend the benefits of Linked Learning from high schools to postsecondary institutions.

Pathways:

### CONTACT:

Linda Collins, Executive Director - [lcollins@careerladdersproject.org](mailto:lcollins@careerladdersproject.org)

## Mayor's Youth Employment And Education Program (Myeep)

### **LOCATIONS:**

2012 PINE STREET, SAN FRANCISCO, CA 94115

### **SUMMARY:**

As a collaborative of non-profit organizations, the mission is to provide job readiness training, work experience, academic support, and personal development to San Francisco youth challenged in their attempt to access employment. MYEEP leverages the desire of young people to be employed to engage them in job readiness training, youth development, and educational activities. Organizations receiving MYEEP funding include: Young Community Developers, Bernal Heights Neighborhood Center, Chinese Community Youth Center, Horizons Unlimited, Temple United Methodist Church, Vietnamese Youth Development Center, Visitacion Valley Beacon Center, Buchanan YMCA and Jewish Vocational Services.

### **ENROLLMENT CRITERIA:**

High school youth

### **TRAINING/CLASSES:**

See individual organization for more information.

### **PATHWAY:**

### **CONTACT INFORMATION:**

Alvin Woo, [alvin@myeep.org](mailto:alvin@myeep.org)  
415-202-7903

## **Mission Economic Development Agency (MEDA)**

**LOCATION:** 2301 Mission Street, Suite 301, 94110

**SUMMARY:**

MEDA is a community-based economic development corporation working to improve economic and social conditions in the neighborhood by stimulating investment, enhancing the business environment, and creating jobs for area residents. MEDA is committed to maintaining the cultural identity and resources of the Mission District.

**ENROLLMENT CRITERIA:** Low- to moderate-income Latino families

**TRAINING/CLASSES:** There are no classes/training in technology and no plans to add anything at this time.

**CONTACT INFORMATION:** DIANA MAYORGA, DMAYORGA@MEDASF.ORG

## **SAN FRANCISCO CITIZENS INITIATIVE FOR TECHNOLOGY AND INNOVATION (SF.CITI)**

### **LOCATION:**

### **SUMMARY:**

sf.citi is a 501(c)6 organization created to leverage the power of the technology community around civic action in San Francisco. sf.citi supports innovative policies and works collaboratively with government to find new solutions to historic problems facing San Francisco, and consolidate a voice in promotion of tech sector interests and growth. sf.citi facilitates dialogue and the sharing of new ideas within the tech community itself and keeps innovators in the industry informed and connected.

sf.citi develops and promotes key policy programs aimed at making San Francisco a better and more productive place to live and do business. Projects in development include public safety, transportation, job creation, training, placement, and education innovation.

sf.citi currently partners with over 280 member companies and organizations.

Future Graduates Summer Tech Internships program is a partnership between the San Francisco Police Foundation and sf.citi designed to enhance high school youth access to real-world job training by placing them at SF-based tech companies in paid summer internships. The program encourages students to graduate high school, pursue fulfilling careers, and lead productive, healthy lives, highlighting the innumerable possibilities of success and learning that lie ahead. Last summer, 20 San Francisco Unified School District high school students, ages 14-18 accepted 8-week, 5 hours a day internships at 12 San Francisco-based tech companies. Each student received a \$1,250 stipend funded by a \$25,000 sf.citi grant.

### **CONTACT:**

Ron Conway, Chairman - [ron@sfciti.com](mailto:ron@sfciti.com)

## Office Of Economic Workforce Development's Youth Workforce Services

**LOCATION:** Workforce Development Center - Southeast, 1800 Oakdale Avenue Employment Information Center (EIC), 170 Otis Street, 1st floor  
Tenderloin Workforce Center (TWC), 39 Jones Street  
Workforce Development Center-Mission, 3120 Mission Street

### **SUMMARY:**

OEWD's Youth Workforce Services provide San Francisco's most disadvantaged youth with access to a broad continuum of education, work experience opportunities and supportive services that lead to educational attainment, occupational skills development, and attachment to the workforce system. A priority is placed on re-engaging youth disconnected from the education system and labor market to achieve academic credentials, transition to post-secondary education, and/or secure living wage employment.

**ENROLLMENT CRITERIA:** Young adults 17 to 21 who are low income and have multiple barriers to employment. Specifically, high school youth who are on track to graduate, but do not plan on attending post-secondary school, and youth who have a high school diploma or GED but who are unemployed or not engaged in formal post-secondary education are encouraged to apply.

### **TRAINING/CLASSES:**

**Youth Sector Bridge** programs prepare youth/young adults with basic education and technical skills that are taught within the context of a specific industry sector. Services include: intensive case management services, adult mentoring, contextualized learning, workplace exposure, a subsidized work experience, basic skills building, educational support and tutoring.

**PATHWAY:** These programs provide youth with pathways to post-secondary education, further sector training or industry-recognized certification.

### **CONTACT INFORMATION:**

Workforce Development Center Southeast - 415: 970-7762  
Employment Information Center - 415: 557-5636  
Tenderloin Workforce Center - 415: 554-8707  
Workforce Development Center - 415: 401-4800

## Summer Youth Employment Program

### LOCATION:

### SUMMARY:

The City and County of San Francisco's Summer Youth Employment Program (SYEP), managed by the OEWD, offers paid work experiences for low-income youth ages 16-21 who live in San Francisco. SYEP provides young people with hands-on work experience, job readiness training and ongoing support through partnerships with local community-based organizations. All interested applicants must meet income and program requirements to be eligible for this summer program.

## **TECHSF**

### **LOCATION:**

### **SUMMARY:**

TechSF offers training in high growth IT occupations that are currently in demand, including Networking, Tech Support, Programming, and Multimedia, in order to prepare San Francisco's residents for entry into dynamic careers in the Information Technology Industry. TechSF provides vocational skills training, work experience opportunities, job placement assistance, and career advancement to training participants and other individuals working in the IT field.

TechSF services are offered through Bay Area Video Coalition, BAYCAT, CCSF and Year Up Bay Area in collaboration with West Ed and the Office of Economic and Workforce Development, with funding from the U.S. Department of Labor.

Youth can receive referrals to training, online tutoring, certificate examinations, internships, and employment.

Adults and youth who are at least 18 years of age, registered for Selective Service (males under 25 years of age), who possess a High School Diploma or G.E.D, and who are unemployed or underemployed are eligible for the program.

Priority is given to long-term unemployed individuals who lost their jobs during the recent recession (commencing from January 1, 2008 forward), and have exhausted unemployment benefits, or have not yet reconnected with a job that provides comparable responsibility and pay (underemployment), or who are working part-time job(s) when they want a full-time job, or who have become discouraged and have stopped looking for a job.

### **CONTACT:**

Rhonda Simmons, Director of Workforce Development - [workforce.development@sfgov.org](mailto:workforce.development@sfgov.org)

## YEAR UP

**LOCATION:** 210 Spear Street, San Francisco, CA 94105

**SUMMARY:**

Year Up is a one-year, intensive training program that provides a combination of hands-on skill development, college credits, and corporate internships. Eighty-eight percent of graduates are employed and earning competitive wages or attend college within four months of completing the program.

For the first six months of the program, students develop technical and professional skills in the classroom. They apply those skills during the second six months on an internship at one of Year Up's 200+ corporate and government partners. Students earn up to 23 college credits and a weekly stipend, and are supported by staff advisors, professional mentors, dedicated social services staff, and a network of community-based partners.

**ENROLLMENT CRITERIA:** Low-income young adults, ages 18-24

**TRAINING/CLASSES:**

Technical skills classes at Year Up might include: Desktop and Network Support, Help Desk, Hardware Repair, Operating Systems, Disk Formatting, Partitioning and Ghosting, Peripherals, Software Installation, Viruses and Malware, Microsoft Office and Outlook, and Networking and TCP/IP.

**PATHWAY:**

**CONTACT INFORMATION:** Sarah Jo Szambelan, Relationship Mgmt Specialist  
[SSzambelan@YearUp.org](mailto:SSzambelan@YearUp.org)  
415-512-7588



## Youth Sector Bridge

### LOCATION:

### SUMMARY:

**Youth Sector Bridge (YSB)** is an OEWD program targets low income youth ages 17-21 who are involved in the justice system, not on track to graduate from high school, or have other barriers to employment. The program provides job placement, job readiness training, paid internships, academic assistance, case management and other support services, and transition to secondary education, career options or a sector academy.

All participants complete a five-hour orientation before being placed at a work site. The orientation prepares youth teams to deliver computer trainings to their own class of 7 to 10 seniors. CTN is also collaborating with MOUSE Squad of California's Student Tech Leadership program to develop participants' project management, teamwork, leadership, and organizational skills. Youth trainers will also attend monthly professional development trainings with the Intergenerational Program Manager for additional support and workshops, including how to get started in an IT career, STEM education, and elder sensitivity trainings.

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