

2014-2015 Instructional Program Review

Program Name: **Drafting Technology**

Program Contact: **Vorobey, Lilya**

Academic Year: **2014-2015**

Status: **Submitted for review**

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1. Description of Program

Provide a brief description of the program and how it supports the college's **College Mission and Diversity Statements, Institutional Priorities, 2013/14-2015/16, 5 in 5 College Strategies, Spring 2011**, and other **Institutional Program Planning** as appropriate.

Drafting is common to all manufacturing and construction activities. The drafter interprets the engineer's, architect's, interior designer and industrial designer's ideas, presenting them in the language of manufacturing and construction.

The CSM Drafting Department offers three distinct sequences for students. Which sequence a student selects depends on their career technical and/or educational goals.

Aligning with the Board of Trustees' Core Value of a Student Centered Mission, as well as College of San Mateo's Mission Statement, students may choose an AA, AS degree or a Certificate of Achievement study track.

Drafting 121 and 122 (CAD using AutoCAD) is a two-sequence course of study which is designed for students majoring in Architecture, Industrial Design, Interior Design as well as updating drafting skill sets needed in our community.

Drafting 113 (REVIT), a Building Information Modeling course caters to architects, plumbers, building contractors, inspectors, electricians and project managers as well as students of architecture and interior design.

Drafting 110 and 111 (SolidWorks), a 3D modeling track is for industrial designers, engineers, architects and the community working in the machining and fabrication trades. This includes prototype shops and the medical device production industry.

All drafting classes transfer to CSU and will fall under Area E5d career exploration, and self-development section of the AA/AS Degree requirements (to be included in the next CSM catalog).

The CSM Drafting Department, in support of the 5 in 5 College Strategies, is currently providing early entry to high school students as well as increasing CTE outreach and community collaborations with student internships opportunities.

2. Student Learning and Program Data

A. Discuss Student Learning Outcomes Assessment

1. Reflect on recent SLO assessment results for courses offered by the program. Identify trends and discuss areas in need of improvement.

All of our drafting courses have real life based technical problem solving projects. SLOs are assessed via quizzes, project and homework assignments. We have found that students who have not had a technical (hands on) drafting course do not do well in visualizing and do not complete assigned projects as well as those who have had practice in sketching. Thus, a one unit sketching and visual thinking course will be added to the curriculum. In addition to training students in theoretical concepts for understanding the basics of software programs, we are adding the social construction of community based projects, with the intention of having them make inquiries in the social, cultural, and political aspects of design processes used in their field of study such as architecture, interior design and building construction.

2. Comment on the success rates in the program SLOs that are aligned with specific course SLOs. What do the program SLO and course data reveal about students completing the program? Identify trends and discuss areas in need of improvement. Is the alignment between course and program SLOs appropriate and informative? See **course-to-program SLO alignment mapping**.

Even though our SLO success rates are high we have one specific issue with students completing our program – that of the availability of our capstone class, DRAF 130. Even though it is running this semester after a 5 year hiatus, we have difficulty filling the advanced classes due to the availability of only one feeder class per software program. The majority of students come to take drafting courses because an employer may require a specific software program, the student is looking to update their skill set to the newest version of the software program or they are interested in working in a specific field that requires a specific software skill. Thus, not all students are interested in completing the degree or certificate since their interest, most often than not, is course specific.

We have been touting the benefits of learning all of the software programs we offer and have found that more students are showing an interest in acquiring a degree or certificate.

3. Evaluate the program SLOs in relation to survey data from the degree and certificate award earners survey. What does the survey data reveal about the effectiveness of the program SLOs? Identify trends and discuss areas in need of improvement.

Please see question #2

4. Describe any additional methods used to assess program SLOs and reflect on the results of those assessments.

We have recently looked at other aspects of what the drafting field requires and are altering the classroom environment to include the following items that relate directly to our SLOs.

Effective Communication: In the field a drafter is required to communication with employers and employees. All of our courses require papers, lab reports, and drawings be completed as well as oral presentations and students who complete the courses have an 86% success rate.

Critical Thinking and Problem Solving: All of the program courses require students to think critically and solve problems while solving problems through construction and design. Students are encouraged to reflect on their program needs at all times, and seek program advising when developing program goals. Self-reflection is encouraged as part of the critical thinking/problem solving process. Much of this communication requires personal confidence and self-reflection in order to be effective. Again in recent courses offered we have attained 86% and above the expected 75% needed to meet this criterion

Social Awareness and Diversity: Students live and work in a classroom environment of mixed cultures. Program students learn in their classes to work with and grow to understand the need to respect other cultures as future employees. Students are further taught that effective interpersonal communication requires cultural sensitivity.

Ethical Responsibility: Students learn basic competencies in the classroom. Students must act professionally and demonstrate professional competence during class and during presentations. They are also expected to act professionally when attending local workshops, seminars and presentations outside of class.

5. For any courses in the program that satisfy a GE requirement, which GE SLOs are supported or reinforced by the course SLOs? What do assessment results for the course SLOs reveal about student attainment of the GE SLOs? See **GE SLO Alignment Summary Report** or **All Courses GE SLO Alignment Data**.

At this time we are not supporting GE SLOs.

B. Student Success Indicators

1. Review **Student Success and Core Program Indicators** and discuss any differences in student success indicators across demographic variables. Also refer to the **College Index** and other relevant sections of the **Educational Master Plan: Update, 2012**, e.g., Student Outcomes and Student Outcomes: Transfer. Basic Skills programs should also refer to **ARCC** data.

The successful completion rate for Fall and Spring 2011 to 2014 DRAF courses was 66.2%, 67.6%, and 73.8% respectively with an accumulated average is 69.2%. DRAF courses have a 83.1%, 82.4% and 83.6% retention rate respectively. Our numbers are actually climbing!

On average this means DRAF is only 1.6% below the college's 82.5% for this periods retention rate.

Regarding other measures, DRAF students are similar to the college overall with younger students (19 years or less and 25-29) having the lowest success rates while older students (20-24, 30 – 50+) have the highest successful course completion rates.

Students in the DRAF courses are more often returning students attempting to re-evaluate their skill set. Thus they are not interested in transferring, although, those who do transfer generally list something other than DRAF as their majors and are not entered into our transfer rates.

All DRAF courses have approximately A 4:1 ratio of male to female which is down from 5.3 to 1 male at the last writing of this report. The success rate of males and females is disconcerting since females are roughly 14% lower than males. We attribute this to the current climate where women are not encouraged to go into the mechanical design, industrial design, architecture, engineering and construction fields.

The top three ethnic groups in the DRAF courses are White (50.3%), Hispanic (13.3%), and Filipino (11.9%) with Asian students at 11.2% coming at fourth. At the college level these groups have 29.3% (White), 6.7% (Filipino), 19.5% (Hispanic), 15.8% (Asian) . The high percentage of White students may have to do with the working engineers and designers who come to take drafting as a supplement to their job duties.

2. Discuss any differences in student success indicators across modes of delivery (on-campus versus distance education). Refer to **Delivery Mode Course Comparison**.

Currently all of the drafting classes are lecture / lab. On line courses would be difficult to offer since beginning courses require a considerable amount of guidance in mouse and command usage. For example, one command will require a student to use both the left mouse button, right mouse button as well as the center wheel. This is something that would be difficult instruction in a virtual setting since understanding what the student is doing wrong is easier to correct when watching the student first hand. A large percentage of our students have actually attempted to take an on-line course only to find that the physical lab time provides them with immediate corrections to their learning obstacles via the instructor or adjacent student.

C. Program Efficiency Indicators. Do we deliver programs efficiently given our resources?

Summarize trends in program efficiency as indicated in the **Student Success and Core Program Indicators** (LOAD, Full-time and Part-time FTEF, etc.)

DRAF LOAD dipped in 2012-13 when the full time faculty member was on release time to oversee SLO and TracDat for the Technology Department. The difference between 2011 (418.8 LOAD), 2012 (276.6 LOAD) and 2013 (481.3 LOAD) was due to only two classes being taught in 2012-13 rather than three.

The department has one full time faculty. Since we have not been able to offer second semester courses due to low enrollment (not enough first sections to secure 20 students for the second course), we have not offered the second semester courses that would normally employ two adjunct faculty.

We have been reduced to one lab which has made it difficult to offer second semester sections. Our day time program was discontinued when a full time professor retired. The discontinued welding program and manufacturing technology programs provided the instructor of record for this department.

3. Career Technical Education

D. Additional Career Technical Education Data - CTE programs only. (This information is required by California Ed. Code 78016.)

1. Review the program's **Gainful Employment Disclosure Data, External Community**, and other institutional research or labor market data as applicable. Explain how the program meets a documented labor market demand without unnecessary duplication of other training programs in the area. Summarize student outcomes in terms of degrees, certificates, and employment. Identify areas of accomplishment and areas of concern.

At this time DRAF has an AA/AS degree and a Certificate of Achievement and all of the DRAF courses are CSU transferable. Since drafting is no longer a stand-alone occupation, those entering our course of study may list other transferring majors. In San Mateo County, our courses provide instruction for not only students, but architects, engineers, mechanical and industrial designers, interior designers and aerospace designers.

Employment of drafters is expected to grow 6 percent from 2010 to 2020 (U.S. Occupational Handbook), slower than the average for all occupations since engineers, industrial designers and architects are now learning the software programs thus "drafting" is no longer a stand-alone occupation. Developments in software programs used by "drafters" and other professionals are changing the nature of drafters' work and how this work will have to be done. Thus, it is imperative that we market to touch specific industries such as electronics, architecture, interior design, industrial design and engineering.

2. Review and update the program's Advisory Committee information. Provide the date of most recent advisory committee meeting.

The Drafting Advisory Council met on October 23, 2013 Members present were:

Robert Scheren, AIA Architect, Dean & Professor Emeritus, Kent State University Jason Hill, Fly SFO, CAD Manager

Jeff Payne, SFO Airport, CAD Manager, Adjunct Faculty

Jason Silva, Student Representative

Lilya Vorobey, Faculty

Dean Kathy Ross

At this meeting, the board gave the department several suggestions based on the college providing a new computer lab. The main objective was to offer Autodesk's REVIT software which is considered to be a "major plus" in job interviews for architects, electrical engineers, plumbing designers, contractors, H-Vac, mechanical and structural design of buildings. Since then we have implemented the course into our curriculum as well as our degrees and certificates.

Since October 2013, I have met with individual advisory board members to address needs and ideas that can be incorporated into our classes.

4. Additional Factors

Discuss additional factors as applicable that impact the program, including changes in student populations, state-wide initiatives, transfer requirements, advisory committee recommendations, legal mandates, workforce development and employment opportunities, community

needs. See **Institutional Research** as needed.

The Advisory Committee has recommended that we offer REVIT - a CAD program that is recommended preparation (in addition to AutoCAD) for architectural related employment. This course was offered in Fall 2013 and is now a filling each semester.

The major issue drafting program faces is the implementation of a day program to support filling second semester courses. This with a marketing program to specific student populations could produce a viable program.

Living in the Bay Area provides the opportunity to hire faculty who are involved in the latest technology advancements. Yet the ever changing nature of software programs that support the industries also require professional development.

5. Planning

A. Results of Program Plans and Actions

Describe results, including measurable outcomes, from plans and actions in recent program reviews.

A DRAF 111 SolidWorks II class was added to the curriculum in 2011 although filling the class with the required 20 students has been problematic in that we are only offering one section of beginning course which then creates a low enrollment in the second semester courses. In addition we have added a DRAF 113 REVIT class that is now in its fourth semester (Spring 2015). We have to publicize our courses since students mention that they find out classes by chance.

Another factor that undermines enrollment is the lack of local knowledge of our curriculum in the area's high schools. Our dean is working on a pathway to the CTE programs at CSM. in addition to this we are modeling short courses that will be program specific such as a drafting program catering to electronics or architecture in the hopes of attracting more students on our campus and providing them with a language that is not CAD generic but in fact specific to their needs.

B. Program Vision

What is the program's *vision* for sustaining and improving student learning and success over the next three years? Make connections to the **College Mission and Diversity Statements, Institutional Priorities, 2013/14-2015/16**, and other **Institutional Program Planning** as appropriate. Address discussion in the Student Learning and Program Data section: SLO assessment results and trends in student success indicators.

[Note: Specific plans to be implemented in the next year should be entered in C of the Planning section.

CTE programs must address changes in the context of completion and employment rates, anticipated labor demand, and any overlap with similar programs in the area as noted in D1 and D2 of the Career Technical Education section.]

In the next three years to continue our efforts to schedule and maintain a wide breadth of drafting courses that meets the needs of our diverse student population. We will be marketing the program with CSM's marketing department to veterans, handicapped persons, as well as industrial designers, architects, interior designers as well as engineers. As the department grows, we will be able to add advanced courses or summer courses in order to maintain interest in the program. The department is a one person department and generally only offers only three courses. In the future, we will strengthen partnerships with business and industry through the Advisory Board to be able to offer more courses.

1. To guide future faculty and staff development initiatives, describe the professional activities that would be most effective in carrying out the program's vision to improve student learning and success.

There are a number of seminars available for CAD/Drafting instructors that provide the latest developments in the field. These seminars are attended yearly by both the fulltime as well as the adjunct instructors.

The ever-changing nature of the software programs requires retraining and rethinking of curricula. Faculty spends off time learning new

programs, creating course work without the aid of support from the college.

2. To guide future collaboration across student services, learning support centers, and instructional programs, describe the interactions that would help the program to improve student success.

Availability of open computer labs that are able to support the software programs would benefit students who are unable to afford copies of the programs or computers that are able to support the size requirements of the CAD programs. Our lab would require for a faculty member to be present at all times if we were to have open access. Unfortunately since we have only one full time faculty, this is not possible at this time.

Currently outside job boards are used to help students find internships and fulltime employment.

3. To guide the **Institutional Planning Budget Committee (IPBC)** in long-range planning, identify any major changes in resource needs anticipated during the next three years. Examples: faculty retirements, equipment obsolescence, space allocation.

See the Resource Requests section below to enter itemized resource requests for next year.
Leave sections blank if no major changes are anticipated.

Faculty

Equipment and Technology

1. Computer station requirements will have to be updated as the CAD software programs improve. We now have access to a new computer lab that CIS allows us to use in the evenings.
2. Our projector in 19-110 sits on a roll table that has many cables that are trip hazards. It would benefit the classroom to have the Epson projector secured to the ceiling on a proper bracket.
3. desktop CNC machine would benefit all levels of students compared to accessing a 3D printer since the latter requires 3D skills. First semester AutoCAD students work in 2D, thus would not be able to use a 3D system.

Instructional Materials

Classified Staff

Facilities

New carpeting for the 19-110 lab to replace the ripped carpet. Building 19 also has poorly maintained restrooms.

C. Program Plans and Actions to Improve Student Success

Prioritize the plans to be carried out next year to sustain and improve student success. Briefly describe each plan and how it supports the **Institutional Priorities, 2013/14-2015/16**. For each plan, list actions and measurable outcomes. (Plans may extend beyond a single year.)

Plan 1

Title:
Improve Student Success

Description
<ol style="list-style-type: none"> 1. Improve the academic success of all students 2. Improve degree and certificate completion rate

Action(s)	Completion Date	Measurable Outcome(s)
Develop and offer a sketching class	Spring 2016	More varied yet comprehensive student skill level for the job market

Plan 2

Title:
Promote Academic Excellence

Description
<ol style="list-style-type: none"> 1. Improve readiness for employment 2. Improve transfer rates

Description
Market the program courses to high schools, employers and the community.

Action(s)	Completion Date	Measurable Outcome(s)
Visit High Schools to market program	Fall 2015	More students, better outcome
Send out flyers to employers	Fall 2015	Community awareness of our program.

Action(s)	Completion Date	Measurable Outcome(s)
Connect with employers for internships	Fall 2015	Offering links to internships will prepare students for employment.
Offer courses that will complete the degree requirements.	Spring 2016	Added courses will allow students to complete degrees and certificates.

Plan 3

Title:
Market program

Description
Market the program courses to high schools, employers and the community.

Action(s)	Completion Date	Measurable Outcome(s)
Visit High Schools to market program	Spring 2015	More students, better outcome
Send out flyers to employers	Spring 2015	Community awareness of our program.

6. Resource Requests

Itemized Resource Requests

List the resources needed for ongoing program operation.

Faculty

NOTE: To make a faculty position request, complete **Full-time Faculty Position Request Form** and notify your Dean. This request is separate from the program review.

Full-time faculty requests	Number of positions

Equipment and Technology

Description	Cost
Desktop CNC machine Nomad 883 Price, tax and shipping cost:	\$2900.00
Epson Projector installation (Labor) for 19-104 lab	\$1200.00
Epson projector ceiling mounts for 19-110 and 19-104 labs	\$200.00

Instructional Material

Description	Cost
Autodesk Subscription Renewal	\$1770.00
Autodesk Technical support (\$695.00)	\$695.00
Solidworks Subscription Renewal	\$1961.25

Classified Staff

Description	Cost

Facilities

For immediate or routine facilities requests, submit a CSM Facility Project Request Form.

Description	Cost
Carpeting for 19-110 lab (Carpeting in the lab is over 10 years old	??

7. Program Maintenance

A. Course Outline Updates

Review the **course outline update record**. List the courses that will be updated in the next academic year. For each course that will be updated, provide a faculty contact and the planned submission month. See the **Committee on Instruction website for course submission instructions**. Contact your division's **COI representatives** if you have questions about submission deadlines.
Career and Technical Education courses must be updated every two years.

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Courses to be updated	Faculty contact	Submission month
All	Lilya Vorobey	Fall 2015

B. Website Review

Review the program's website(s) annually and update as needed.

Faculty contact(s)	Date of next review/update
Lilya Vorobey	Yearly

C. SLO Assessment Contacts

Faculty contact(s)	Date of next review/update
Lilya Vorobey	Spring 2015
