SKYLINE COLLEGE
ANNUAL PROGRAM PLANNING SELF-STUDY

*Note: To complete this form, **SAVE** it on your computer, then send to your Division Dean/VPI as an **ATTACHMENT on an e-mail message.***

Program Title ESTM **Date Submitted** 3/10/15

Key Findings: Enrollment is and has been low due to absence or lack of off-campus marketing, outreach, public relations, presence on campus (most students don©t even know about the ESTM program or where it is located as there are no signs designating location), listing in catalog, and course listing in counselor database. Due to changes in industry and consumer markets, new courses are needed to meet the changing demands of our community. The new and projected long-term needs are for courses related to new construction (specifically Zero-Net Energy Construction) and Water Efficiency & Conservation. Addressing this demand, trends in enrollment are expected to increase. The solar industry continues to grow at a rapid pace which will require more emphasis for long range planning. Existing Solar curriculum is meeting current demand.

1. Planning Group Participants (include PT& FT faculty, staff, students, stakeholders)

List of names and positions: Bruce Greenstein, full-time faculty, Celia Canfield, adjunct faculty, Doug Faust, adjunct faculty, Ed Thomas, adjunct faculty, Peter Lum adjunct faculty, Peter Waring, adjunct faculty, Laura Seidman, adjunct faculty, Omer

2. Contact Person (include e-mail and telephone): Bruce Greenstein greensteinb@smccd.edu 738-4487

3. Program Information

A. Program Personnel

Identify the number of personnel (administrators, faculty, classified, volunteers, and student workers) in the program:

0 Administrators, 1 FT Faculty, 7 Adjunct Faculty, 0 Classified, 0 Volunteers, 0 Student Workers

FT Faculty:	1	**PT/OL Faculty (FTE):**	.4
FT Classified:	0	**PT Classified (FTE):**	0
Volunteers:	0	**Student Workers:**	0

B. Program mission and goals

State the goals/focus of the program and how the program contributes to the mission and priorities of the College and District. Address how the program meets the current year's strategic priorities. (200 word limit is recommended.)

The goal of the program is to educate and train individuals to enter or advance in the energy efficiency and/or solar industries or transfer to higher education. The focus is to provide well-rounded curriculum so students may acquire the Knowledge, Skills, and Abilities essential to succeed in these industries. Providing " hands-on" and enriched learning opportunities is a keystone to this program. Community and industry partnerships were formed to engage students with "real world" experiences. Ongoing partnerships were fortified and continue to develop. These partnerships align with this year's strategy to create a presence as a regional training center for energy efficiency and solar. Supporting local and regional training organizations by sharing facilities and faculty established our reputation for premier facilities and expert faculty. Hosting industry-related conferences and workshops also enhanced our reputation and presence, a strategic priority that is sure to pay dividends. Outreach efforts will continue recruitment for underserved and minority populations.

The program aligns with the college mission and priorities in building community connections, addressing workforce needs, and preparing graduates to enter the workforce.

4. Program/Service Area Student Learning Outcomes and Program Data

A. Summarize recent course (for instruction, including student service courses) or program (for student services and every three years, CTE programs) SLO assessment, identify trends and discuss areas in need of improvement. Please attach summary Tracdat reports with assessment and analysis for SLOs evaluated during the last two years (prior to submission deadline of April 1st). (200 word limit is recommended.) Tool: https://sanmateo.tracdat.com/tracdat/

ESTM

B. Analyze evidence of Program performance. Review and analyze productivity, student characteristics and outcomes. (200 word limit is recommended.)
Tool: http://www.skylinecollege.edu/prie/programdata.php

No program data available for review.

C. Explain how other information may impact Program (examples are business and employment needs, new technology, new transfer requirements etc.)
(200 word limit is recommended.)

The Advisory Council meeting is planned to meet at the end of this semester to determine and receive feedback on employment needs, new technology, etc. The Title 24 (California's Energy Code) has been revised and new standards have been established that will require additional training for new and existing workforce. National certifications have also underwent revisions and additions, creating new KSA's and additional testing parameters. More financing mechanisms are available for Solar and Energy Efficiency upgrades than ever before. Greenhouse emission reduction and new construction design targets are also driving demand for education and training to meet these challenges. More research and discussion is needed to better ascertain impacts and needs for new transfer requirements. Faculty engagement in the DOE Solar Instructor Training Network and the Energy Faculty Forum will also provide insite to new industry trends and relevant education and training updates.

San Mateo County has approved a bond to construct a new building for the program. The current facilities are not adequate to fully deliver instruction and training. The new building will need to include more space to accomodate the growth of the program. Specifically the addition of at least six more Solar PV Inverter Stations (which equates to six or more roof sections, 12 more solar panels, and all the Balance of System (AC/DC X-Ops, Wire, Conduit, Connectors, etc.). Storage rooms are at maximum capacity now, therefore more storage will be needed for additional equipment and supplies. In regard to the Energy Efficiency courses, the new building will need to integrate a "Building Simulator" similiar to the existing "Residential House Simulation" (aka Mike's House, Test House, Half House). Since the program has plans to expand the curriculum into the commercial, multifamliy and new construction sectors, the new "simulator" will need additional components and features to support the curriculum lab work. Designing the new building to serve as a "Living Lab" will allow the structure to serve students beyond the normal classroom setting. This building has the potential to be much more than just another modern building, but rather a symbol; a symbol of commitment from our District to support sustainable growth and developement in our community - a symbol of hope that ESTM can and will empower and transform a new workforce to meet the growing energy challenges.

5. Curricular Offerings

A. Program Curriculum and Courses. If your program does not offer curriculum, please state "N/A". Tools: CurricUNET http://www.curricunet.com/smcccd; https://sanmateo.tracdat.com/tracdat/

Respond to the following:

- What new courses (excluding individual Selected Topics [665] topics and Experimental [680/880] courses) have you added to your program curriculum in the past academic year? List by Department, Course Number and Course Title.
- Note that you've added new courses to the department's three-year calendar of assessment and requested that they be added to TracDat.
- Note that you've done the following for new courses on TracDat:
    - Uploaded SLOs?
    - Mapped course-level SLOs to PSLOs (including relevant interdisciplinary degrees) and ISLOs?
    - Uploaded assessment method(s) (need not be specific)?

ESTM 680SA High School Summer Energy Camp
- TracDat Coordnator to input data Summer 2015
- SLO's are uploaded
- TracDat Coordinator will map course-level SLOs to PSLOs and ISLOs
- To be completed by TracDat Coordinator upon aquisition of data from instructor

ESTM 880SC Construction Basics 1 (for High School students)
- Added to TracDat
- SLOs uploaded
- TracDat Coordinator to complete mapping
- Assessment Method(s) have been uploaded

ESTM 880SD Construction Basics 2 (for High School Students)
- Course currently under development

Below are additional courses being considered for development:

*ESTM 680?? Zero-Net Energy Construction (new mandates will drive this sector - all new homes must be Zero-Net Energy by 2020, Commercial Buildings by 2030). The demand has already started and the projections for future demand remain stable. This course will also cover Passive House, which is currently trending with no end in sight...finally!

*ESTM 680?? Water Efficiency & Conservation
A course on assessment, retrofit, and new installation for both interior and exterior applications. The QWEL (Qualified Water Effficient Landscaper) Certification may also be integrated into the course.

*ESTM 680?? Commercial Energy Efficiency and Faciltiy Management
This sector is also experiencing growth with projections for high-growth in the near future. More research and developement is needed to design this course. Faculty will work with District Energy Management Manager, Joe Fullerton to complete the research and develop the course, workshop, or short-course.

*These courses may be piloted as workshops or short course offerings.

B. Identify Patterns of Curriculum Offerings

Respond to the following:

- Identify the planning group's two-year curriculum cycle of course offerings by certificates and degrees.
- Describe the ideal curriculum cycle.
- Discuss any issues.

Fall 2014

ESTM 402 Introduction to Residential Construction
ESTM 410 Introduction to Solar Installation and Integration
ESTM 411 Introduction to Solar Photovoltaics (PV) Systems and Markets
ESTM 421 Principles of Building Science, How Houses Work
ESTM 427 Introduction to Whole Home HVAC
ESTM 441 Solar Thermal Technology and Design

Spring 2015

ESTM 400 Clean Energy Concepts Policies Industries
ESTM 412 Solar Photovoltaics (PV) Design Fundamentals
ESTM 413 Solar Photovoltaics (PV) Finance and Sales
ESTM 425 Building Performance Assessment
ESTM 426 Building Performance Retrofitting
ESTM 428 Field Training and Exam Preparation for Energy Efficiency
ESTM 445 Commercial Solar PV Finance and Sales
ESTM 490 Capstone Project in Energy Systems Technology Management

The courses listed here, plus additional courses in Business, Environmental Science, Management will enable students to complete the degrees and certificates within the specified time frame.

6. Response to Previous Annual Program Plan & Review

List any recommendations for the program and your responses to these recommendations based on previous Annual Program Plan and/or CTE Professional Accreditation report.

* Is the interdisciplinary composition of the degree and certificate programs effective in providing students with skills needed by employers in an efficient and effective manner?

Yes. Having the core requirement for Business Math and Business Communication has provided students with additional skills essential to their marketability and success. Additionally, the third core requirement course - Clean Energy Concepts, Policies & Industries, provides students with an overview of clean energy and the policies and industries that comprise the environment in which they will be working. Together, these interdisciplinary courses empower students with the critical-thinking, problem-solving skills that employers demand in this emerging market.

* Are there gaps or redundancies in the programs' curriculum for the kinds of jobs we are targeting and the jobs that students get upon exiting the program?

The industry and consumer demand has shifted since the development of this curriculum. Residential retrofit is growing at a slow rate, whereas, new construction is on a fast growth, as well as being driven by new codes, standards, and mandates. There appears to be more growth and job opportunity in new construction, and that is where we need to develop new curriculum to meet this changing and projected need. Specifically, Zero-Net Energy Construction and Passive House Construction. The other area where demand is increasing due to a number of variables, particularly the current and potential long-term drought that we are experiencing. Based on current and projected conditions, and the underlying need to improve water efficiency and conservation - a new course needs to be developed to meet this monumental issue that is sure to quickly become not only a national, but an international concern on a massive scale. Aside from the items noted above, we have been on point with the education & training in concert with the needs of employers.

* Is the field training, capstone curriculum, and Cooperative education components effective at encouraging student hiring in the intended fields?

Due to low enrollment during the development of the ESTM program, we have not had the volume needed to offer the Capstone component. The ESTM Advisory Council is scheduled to meet at the end of the semester to discuss the curriculum and industry so we (faculty) may make informed decisions in regard to any curriculum revisions or additions that we are considering.
Lack of staff capacity to coordinate and manage Cooperative education partners remains a hurdle to Cooperative Education opportunities for students.
I must note that the "hands-on" field training components inherit in our program have been recognized and applauded by numerous employers in both the energy efficiency and renewable energy sectors.

7. Action Plan

Provide your action plan based on the analysis and reflections provided in the previous sections. Note: resource requests should be connected to action plans

Respond to the following:

- Describe data and assessment results for SLO assessment on the course level (for instruction, including student service courses) or program level (for student services or every three years, career technical education programs). Analyze and reflect on SLO assessment results and other measures of Program performance.
- Analyze and reflect on other evidence described in previous sections. Identify the next steps, including any planned changes to curriculum and pedagogy.
- Identify questions that will serve as a focus of inquiry for next year.

Data and assessment results for Program Student Learning Outcomes are within projected targets and parameters.

Questions we are likely to have for next year's plan include:
1) Did the changes (industry & consumer demand) that we projected demand (performance-based new construction, water efficiency/conservation) actually come to fruition, and did the changes we made address the new demands?
    a) Did ESTM Advisory Council projections actualize?

2) Is the High School Bridge Project being effective, both in terms of student achievement and providing pathways to higher education? Are we seeing increase in enrollment in the ESTM program from this demographic?

3) By having the Certificates and Degrees accredited, listed in the catalog, and accessibility to courses in the counselors' database/counseling system have an effect on enrollment?
  a) What has been most effective in increasing enrollment?

4) Did the projections for growth in the Solar Sector actualize? Are graduates being placed above entry-level and/or recieving better pay?

5) Is the water crisis continuing? Is there enough demand for a Water Efficiency & Conservation Course? I project a massive yes, but we'll see!?

6) Is demand for Zero-Net Energy or Passive House construction increasing? Will our course offerings be sufficient to serve that sector?

7) Is demand for Commercial EE increasing? Will our courses be sufficient to qualify candidates for this sector?

8. Resource Identification

A. Professional Development needs

Continuing to travel to and attend the following conferences and workshops:

* InterSolar
* SolarTech
* Solar Energy Industry Association (SEIA)
* Solar Energy International
* Affordable Comfort Inc. (ACI)
* Dry Climate Forum
* Habitat X
* Association for the Advancement of Sustainability in Higher Education (AASHE)

Faculty will need CEUs and additional professional training to successfully renew or pass exams to retain/acquire certifications/licenses (professional credentials) from the following organizations:

* Solar Instructor Training Network (SITN)
* Building Performance Institute (BPI)
* North American Board of Certified Energy Practitioners (NABCEP)

They may also wish to get the programs accredited by the Institute for Sustainable Power Quality (ISPQ)

B. Office of Planning, Research & Institutional Effectiveness requests

Actions:

- List data requests for the Office of Planning, Research & Institutional Effectiveness.
- Explain how the requests will serve the Student/Program/Division/College needs.

Data requests will be standard, ongoing enrollment and completer data such as that required by the annual plan and 6-year review cycle.

Additional strategy planning assistance could include focus groups and surveys of former students. Labor market assistance for interfacing with the Centers of Excellence, EWD, EDD, and additional environmental scanning for reports would be nice. This data would go to inform strategy and answering questions regarding program effectiveness, gaps and redundancies. By offering summaries of market research (former student engagement), and labor market research to program faculty and industry advisors, they can make decisions with the administration about how to move forward.

C. Faculty and Staff hiring, Instructional Equipment and Facilities Requests
Complete the following table:

Annual Program Planning Resource Needs

Program ESTM **Date** 3/10/15

	Needs	How does this request align with your assessment of student outcomes	How does this request align with your action plan	Estimated cost for facilities and equipment
Personnel	1. 10 hours for electrical contracto 2. Adjunct Faculty for HS Construct 3.	1) Not Related 2) Instructor needed to develop curriculum, and in turn, assessment of student outcomes.	1) Not Related 2) Not Related	1) N/A facilities and equipment. Labor cost TBD 2) TBD, based on experience and education of new hire.
Equipment	1. Calibration for diagnostic tools 2. tools Replacement tools and eq 3. Other items are materials and co 4.	Equipment that was stolen, was never replaced. Students use the equipment for energy efficiency and solar labs to accomplish the basic requirements and achieve the SLOs in all courses with lab requirements.	Lab courses are required courses for degrees and certificates in the ESTM programs. Faculty operate with a straightforward, no frills set of tools and equipment. At times, faculty have had to use their own professional equipment. In the future, to prepare students for cutting edge technology they are likely to encounter on the job in an emerging field, faculty will ma	$4,000 for calibration of energy efficiency equipment $2500 for materials and equipment for energy efficiency courses and test house upkeep $4,500 for state of the art solar equipment to sustain solar programs.
Facilities	1. Construction of a new facility 2. 3. 4.	Industry advisors talk frequently of emerging convergent technology relevant to ESTM including electric vehicle infrastructure, smart grid technology, GNG emission reduction, etc. These needs from industry will likely impact facilities needs for job preparation. Current facility limits enrollment for lab sections due to lack of square footage and equipment.	Industry is rapidly evolving, and this will most certainly change for 2016-2017. New facilities will need to include labs and equipment to meet evolving instruction needs.	???

Course Assessment Report-- Four Column

San Mateo CCCD

SKY Dept - Energy Systems Technology Management

Department Assessment Coordinator: Bruce Greenstein

Course Outcomes	Means of Assessment & Success Criteria / Tasks	Results	Action & Follow-Up
SKY Dept - Energy Systems Technology Management - SKY ESTM 400 - Clean Energy Concepts Policies Industries - Basic Concepts - Explain basic concepts of energy production and systems, climate change, built and natural environment, fields of study and concepts of sustainability and environmentalism?including major U.S. historical political and social movements. (Created By SKY Dept - Energy Systems Technology Management) **Assessment Cycles:** 2014-2015 **Start Date:** 08/18/2014 **End Date:** 12/19/2014 **Course Outcome Status:** Active	**Assessment Method:** Written Report **Assessment Method Category:** Capstone Assignment/Project **Success Criterion:** 70% of students will achieve 80% and above. **Related Documents:** ESTM 400 Report Rubric	02/17/2015 - 80% of students achieved 80% or above. **Result Type:** Criterion met **Reporting Cycle:** 2014 - 2015 **Resources Needed to Implement Action Plan:** none	
		12/01/2014 - Data not available, reports to be submitted December 5, 2014 **Result Type:** Inconclusive **Reporting Cycle:** 2014 - 2015 **Resources Needed to Implement Action Plan:** none	
SKY Dept - Energy Systems Technology Management - SKY ESTM 400 - Clean Energy Concepts Policies Industries - Explain the Tenants - Explain the tenants of the major state and regional environmental and energy policies in California, including major actors and interests, projected economic impacts, and mechanisms for enforcing and incentivizing market transformation (tax credits, rebate incentives, fines, loan guarantees, code enforcement, and innovation subsidies). (Created By SKY Dept - Energy Systems Technology Management) **Assessment Cycles:** 2014-2015 **Start Date:** 08/18/2014	**Assessment Method:** Mid-Term Exam **Assessment Method Category:** Exam **Success Criterion:** 80% of students will achieve 80% or higher on Mid-Term Exam	02/17/2015 - 60% of students achieved 80% or higher **Result Type:** Criterion not met **Reporting Cycle:** 2014 - 2015 **Resources Needed to Implement Action Plan:** none	
		12/01/2014 - Over 80% of students achieved 80% or higher on Mid-Term Exam **Result Type:** Criterion met **Reporting Cycle:** 2014 - 2015 **Resources Needed to Implement Action Plan:** none	

Course Outcomes	Means of Assessment & Success Criteria / Tasks	Results	Action & Follow-Up
End Date: 12/19/2014 **Course Outcome Status:** Active	**Assessment Method:** Final Exam **Assessment Method Category:** Exam **Success Criterion:** 80% of students will achieve 80% or higher on Final Exam	02/17/2015 - 90% of students achieved 80% or higher **Result Type:** Criterion met **Reporting Cycle:** 2014 - 2015 **Resources Needed to Implement Action Plan:** none	
		12/01/2014 - Data not available. Final exam to be completed on December 10. **Result Type:** Inconclusive **Reporting Cycle:** 2014 - 2015 **Resources Needed to Implement Action Plan:** none	
		12/01/2014 - Final Exam data not available. Exam to be completed December 10. **Result Type:** Inconclusive **Reporting Cycle:** 2014 - 2015 **Resources Needed to Implement Action Plan:** none	
SKY Dept - Energy Systems Technology Management - SKY ESTM 400 - Clean Energy Concepts Policies Industries - Catalog and Understand - Catalog and understand the major industry sectors involved in the clean energy economy, including best practices, industry standards, career pathways?including salary and job outlook--industry credentials, and fields of study. (Created By SKY Dept - Energy Systems Technology Management) **Assessment Cycles:** 2014-2015 **Start Date:** 08/18/2014 **End Date:** 12/19/2014 **Course Outcome Status:** Active	**Assessment Method:** Mid-Term Exam **Assessment Method Category:** Exam **Success Criterion:** 80% of students will achieve 80% or better on Mid-Term Exam	02/17/2015 - 60% of students achieved 80% or higher **Result Type:** Criterion not met **Reporting Cycle:** 2014 - 2015 **Resources Needed to Implement Action Plan:** none	
		12/01/2014 - 80% of students achieved 80% or higher on Mid-Term Exam **Result Type:** Criterion met **Reporting Cycle:** 2014 - 2015 **Resources Needed to Implement Action Plan:** none	
	Assessment Method: Final Exam **Assessment Method Category:**	02/17/2015 - 90% of students achieved 80% or higher **Result Type:** Criterion met	

Course Outcomes	Means of Assessment & Success Criteria / Tasks	Results	Action & Follow-Up
	Exam **Success Criterion:** 80% of students will achieve 80% or higher on Final Exam	**Reporting Cycle:** 2014 - 2015 **Resources Needed to Implement Action Plan:** none	
		12/01/2014 - Data not available. Final exam to be completed on December 10. **Result Type:** Inconclusive **Reporting Cycle:** 2014 - 2015 **Resources Needed to Implement Action Plan:** none	
SKY Dept - Energy Systems Technology Management - SKY ESTM 445 - Commercial Solar PV Finance and Sales - Formulate Key Elements - Formulate the key elements to the structuring of solar Power Purchase Agreements for commercial and utility scale projects in a case study or brief proposal. (Created By SKY Dept - Energy Systems Technology Management) **Assessment Cycles:** 2014-2015 **Start Date:** 01/13/2014 **End Date:** 02/18/2015 **Course Outcome Status:** Active	**Assessment Method:** Currently under development **Assessment Method Category:** Other **Success Criterion:** Currently under develoment	02/18/2015 - Currently under development **Result Type:** Inconclusive **Reporting Cycle:** 2014 - 2015 **Resources Needed to Implement Action Plan:** none	
SKY Dept - Energy Systems Technology Management - SKY ESTM 445 - Commercial Solar PV Finance and Sales - Create Case Study - Create a case study or proposal outlining available methods of commercial and utility scale project finance. (Created By SKY Dept - Energy Systems Technology Management) **Assessment Cycles:** 2014-2015 **Start Date:** 01/13/2014 **End Date:** 02/18/2015 **Course Outcome Status:**	**Assessment Method:** Currently under development **Assessment Method Category:** Other **Success Criterion:** Currently under develoment	02/18/2015 - Currently under development **Result Type:** Inconclusive **Reporting Cycle:** 2014 - 2015 **Resources Needed to Implement Action Plan:** none	

Course Outcomes	Means of Assessment & Success Criteria / Tasks	Results	Action & Follow-Up
Active SKY Dept - Energy Systems Technology Management - SKY ESTM 445 - Commercial Solar PV Finance and Sales - Critique Existing Case - Critique an existing case (or produce a response to) a commercial and utility scale project request for proposal (RFP). (Created By SKY Dept - Energy Systems Technology Management) **Assessment Cycles:** 2014-2015 **Start Date:** 01/13/2014 **End Date:** 02/18/2015 **Course Outcome Status:** Active	**Assessment Method:** Currently under development **Assessment Method Category:** Other **Success Criterion:** Currently under develoment	02/18/2015 - Currently under development **Result Type:** Inconclusive **Reporting Cycle:** 2014 - 2015 **Resources Needed to Implement Action Plan:** none	