Program Review and Planning

OVERVIEW OF PROGRAM REVIEW AND PLANNING FOR INSTRUCTIONAL PROGRAMS

Program Review is about documenting the plans you have for improving student success in your program and sharing that information with the community. Through the review of and reflection on key program elements, program review and planning identifies program strengths as well as strategies necessary to improve the academic discipline, program, or service to support student success. With our new Guided Pathways plan, this review becomes even more crucial for the success of our students and college.

We are using the Strengths, Opportunities, Aspirations, Results (SOAR) strategic planning technique to help us focus on our current strengths and opportunities, create a vision of future aspirations, and consider the results of this approach.

BASIC PROGRAM INFORMATION

Academic Year
2018-2019

Are you completing a comprehensive or annual PRP?
Comprehensive

Department Name
Design and Manufacturing Technologies

Discipline Name
Industrial Technology

Department Chair Name
Dennis C. Lutz

Division Name
Career, Technical and Extended Education

Website address for your discipline
https://www2.palomar.edu/pages/dmt/industrial-technology/

Discipline Mission statement
Our mission is to provide a foundation of design and manufacturing skills using Computer Aided 3D modeling software, computer skills in programming CNC machinery using MasterCAM, and the set up and operations of our 3D printers, CNC water jet, plasma cutter, lathe, and mills. Quality control is also incorporated using advanced precision measuring techniques to insure product precision and accuracy. Upon completion of this program, students will be qualified for an entry level position in product design, machining and manufacturing.

(click here for information on how to create a mission statement)

Does your discipline have at least one degree or certificate associated with it?
Yes

Are any of your programs vocational (CTE/CE)?
Yes

List all degrees and certificates offered within this discipline.
CAD/CAM Design and Manufacturing AS Degree
CAD/CAM Design and Manufacturing Certificate (In progress)

Please list the names and positions of everyone who helped to complete this document.
Dennis C. Lutz

Full-time faculty (FTEF)　　　　　　　　**Part-time faculty (FTEF)**
0　　　　　　　　　　　　　　　　　　　　　　.5

Classified & other staff positions that support this discipline
Industrial Technology is a new program and is under the Design and Manufacturing Department. This department also includes Architecture, Drafting, Fashion, Interior Design, and Nutrition. The department has one ADA that supports all of the disciplines.

Additional hourly staff that support this discipline and/or department
Some of the disciplines might have an hourly student to help, but IT does not.

PROGRAM INFORMATION

PROGRAM OUTCOMES

Begin this section by reviewing the Program Review reports for courses and programs in TracDat. All active course and program outcomes should be systematically assessed over a 3-year cycle.

- **Program** = Leads to a degree or certificate

- **Discipline** = A group of courses within a discipline

*Programs will be able to complete program completion and outcome questions.

How well do your program's learning outcomes communicate the scope and depth of the degree/certificate offered and align with employer and transfer expectations?
Our outcomes were based of advisory committee recommendations, COE San Diego Workforce Partnership Labor Market Analysis for Advanced Manufacturing and Machining, along with site visits and interviews from area machining and manufacturing facilities.

Describe your program's plan for assessing program learning outcomes.
My best assessment is when I hear from students that have received a raise or promotion from the skills they have acquired from the classes they have taken from me. I have also had a few students that have gotten entry level machining jobs.

Summarize the major findings of your program outcomes assessments.
I have also hear from employers that have my students working for them and tell me that what they have learned in my classes has been very beneficial to their industry.

Reflecting on the major findings you summarized, what are some questions you still have about students' learning in your program that you have not yet been able to address with your outcomes assessments?
We still have not been able to offer the intermediate or advanced classes. The beginning classes are always full of our existing drafting, engineering, and welding students that are looking to expand their skills. With out the program being listed in the catalog, the students that want to pursue a career in this field just don't know we offer this type of training right now.

Depending on the degree or transfer goals of our students, they have the choice of three different GE

pathways:

- [Associate Degree GE Requirements](#)
- [CSU GE Requirements](#)
- [IGETC Requirements](#)

Palomar College has identified a set of General Education/Institutional Learning Outcomes, which represent the overall set of abilities and qualities a student graduating from Palomar should possess.[Click here for a link to Palomar's GE/ILOs.](#)

How do the courses in your discipline support General Education/ Institutional Learning Outcomes? In your response, please specify which GE/ILO(s) your discipline supports.
This program has no equal in any of the university systems. This is direct training for employment. The most important is "Visual". Students have to read blueprints and visualize the the item to be manufactured. Next is the "Critical Thinking". This type of thinking is different than the usual critical thinking from academia. Students have to evaluate the best process on how to manufacture the item, to include how to hold the part for multiple processes, and every item will have completely different requirements.

Summarize the major findings from your course outcomes assessments that are related to the General Education/Institutional Learning Outcomes that your discipline supports.
Math is the big one, however, I have to teach applied math in all of my courses. I have many students that have advanced math classes, but when it comes to applying it to something real they have no idea. To measure angles I teach basic trigonometry on how to measure angles with a sine bar. This is very important part of quality control to verify the correctness of an item that is manufactured.

PROGRAM COMPLETIONS

Student success is at the core of what we do in assisting students in achieving their goals.

The Chancellor's Office Vision for Success stresses the importance of Program Completion as a major goal for our students. In addition, transfer and career readiness are key components of Palomar College's mission statement. This year, our funding formula has also changed reflecting this emphasis, providing additional funding as a function of the number of completions.

In this section we will identify a program standard and a stretch goal (what you would like to move toward) for program completions.

The standards represent the lowest number of program completions deemed acceptable by the College. In other words, if you were to notice a drop below the set standard, you would seek further information to examine why this occurred and strategies to increase completions.

In this section we will identify a program standard and a stretch goal (what you would like to move toward) for programs.

List the number of completions for each degree/certificate for the previous year.
None

Have your program completions Increased, decreased, or stayed the same over the last 5 years?
Stayed the same

What factors have influenced your completion trends?

Program is not in the catalog.
Poor marketing from our college. Mira Costa has a non credit class for $6,000.00 that covers just a small part of what I do in my classes, and the class is full. I have had students that have paid this and two weeks into my class they state that what I teach is what they wanted to learn.

Are the courses in your discipline required for the completion of other degrees/certificates?
Yes

Please list them
Drafting Technology Technical
Welding Technology (In Progress)
Automotive and Diesel (In Progress)

Do you have programs with 7 or fewer completions in the last 5 years?
Yes

What steps are you taking to address these completions?
I have sat with Cheryl and we did our best to make sure it is in the next catalog.
I am working with San Diego MasterCAM to do monthly seminars "Learn and Lunch" one Friday a month at our shop at Palomar.
I am visiting area machine shops to show them what I am teaching and interviewing the supervisors to see what they need.

What is your program standard for program completion?
50.0%

Why did you choose this standard?
50% of the entry level students are exploring the field. The other 50% of the students will apply the applications acquired not only to the machining area, but also to other areas of manufacturing.

What is your Stretch goal for program completion?
50.0%

How did you decide upon your stretch goal?
I always tell students that Palomar is a good place to find out what you don't want to do, to find out what you do want to do. The beginning class is a good way to find out if this profession is for you. I have the same following in Drafting. Students take the beginning courses in SolidWORKS and AutoCAD to find out if they like technical drawing. Some don't like it, but the ones that do continue on to the advanced classes and obtain excellent careers for life in the field. In my career at Palomar (15 years adjunct and 29 years full time) I find that 40-50% of the basic class enrollment will go forward to my advanced classes.

ENROLLMENT TRENDS

Palomar College uses the WSCH/FTEF ratio as one indicator of overall efficiency in addition to the overall fill-rate for courses.

Although the college efficiency goal is 525 WSCH/FTEF and 85% fill-rate (minimal), there are many factors that affect efficiency (i.e. seat count / facilities / accreditation restrictions).

This information can be found by going to the "Program" page in the PRP Data Dashboard.

What was your efficiency trend over the last 5 years? Was it expected?
There are no WSCH/FTEF for the two classes we have offered, but I have offered the basic MasterCAM

class every semester for the past 5 years, and it has always been 90-100% full.
We have offered the Industrial Math class for years, in fact I took the class when I was a student, and taught it for a few semesters until I got too busy to teach it. The Industrial Math class is an on-line class and always fills to 100%.

What factors have influenced your efficiency trends?
We moved the Technical Math class to an on-line class and increased the enrollment from the usual 20-25 students face-to-face, to 42 students every time we offer it. This is one of the best math classes a the school, but since it is not taught by a "Math" instructor, students do not get the actual math credit.
The Beginning MasterCAM class will always be face-to-face due to the lab requirement.

Are there particular courses or programs that are not getting sufficient enrollment, are regularly cancelled due to low enrollment, or are not scheduled at this time? What is contributing to this issue? Does this level of efficiency meet the needs of the program and the district?
We do need more room for the lab. Right now we have 4 very large machines and two computer measuring machines in the lab. I would like to see more square footage to allow students to have more work area. This will not increase student numbers, but we need the room to work and monitor the students that are running the machinery. These are powerful dangerous machines that can create harm if not used properly.

The Chancellor's Office Vision for Success stresses the importance of reducing equity gaps through faster improvements of underrepresented groups.

ACCJC also requires that colleges establish institutional and program level standards in the area of success rates. These standards represent the lowest success rate deemed acceptable by the College. In other words, if you were to notice a drop below the rate, you would seek further information to examine why the drop occurred and strategies to address the rate.

[Click on this link to review the course success rates (A, B, C, or Credit) for your discipline.](#)

In this section we will identify a course success rate standards and a stretch goal (what you would like to move toward) for programs.

Course Success Rates by gender, age, ethnicity, special population, location, and modality (You can access the Student Equity Plan on the SSEC website https://www2.palomar.edu/pages/ssec/)

COURSE INFORMATION

COURSE SUCCESS AND RETENTION

What is your program's standard for Discipline COURSE Success Rate?
90.0%

Why did you choose this standard?
I am the only instructor that has taught the introduction to MasterCAM. The class is usually full at the first of the semester, and I might get one or two drops during the first two weeks. Once the student commits to the class, will over 95% of them complete the class.

Has your overall course SUCCESS rates increased, decreased, or stayed the same over the last 5 years?
Stayed the same

Was this expected?

Yes

What is your Stretch goal for COURSE success rates?
90.0%

How did you decide upon the goal?
It has been my experience that once the student commits to the class, will over 95% of them complete the class.

Have your overall course RETENTION rates increased, decreased, or stayed the same over the last 5 years?
Stayed the same

Was this expected? Please explain.
Yes

Are there differences in success or retention rates in the following groups? (choose all that apply)

Are there differences in success/retention between on-campus and online courses?
No

Do you have any best practice methods you use for online courses to share with the community?
No

COURSE OUTCOMES

How is course assessment coordinated across sections and over time?
I am the only on that has taught the classes, and I am happy with what I have seen on the assessments. My students are getting entry level jobs and promotions.

How have you improved course-level assessment methods since the last PRP?
This is the first PRP for Industrial Technology

Summarize the major findings of your course outcomes assessments.
The beginning course outcomes are doing everything I expected.

Reflecting on the major findings you summarized, what are some questions you still have about students' learning in your courses that you have not yet been able to address with your outcomes assessments?
I cannot list all of the outcomes that are expected in the class. I evaluate everything the students do: modeling, programming, machine set-up, material handling and quality control (Precision Measuring). This is reflected in the grades and the success of the students passing the class.

What are some improvements in your courses that have been, or can be, pursued based on the key findings from your course learning outcomes assessments?
Right now, for the beginning MastrCAM class I will not change a thing.

PROGRAM CURRICULUM ALIGNMENT, MAPPING, SCHEDULING, & PLANNING

The Chancellor's Office Vision for Success stresses the importance of decreasing the average number of

units accumulated by CCC students earning degrees.

Palomar College's Guided Pathways plan includes clarifying paths for students by sequencing course offerings so that they support scaffolding and timely completion. Our goal is to ensure learning through:

- The mapping and assessment of clear program outcomes that are also aligned to employer and/or transfer institution expectations.

- Engaging and applied learning experiences.

- Effective instructional practices to support students in achieving success.

How do your course outcomes help your students achieve their program outcomes?
The design, programming, set-up, machining, and measuring the product for correctness (Quality Control) all lead from the course outcomes to the program completion/outcomes.

How do your degree maps and scheduling strategy ensure scaffolding (how all parts build on each other in a progressive, intentional way)? How do you share the maps with students?
The courses build on one another.
The new IT-105 class teaches students how to use the precision measuring tools, that is required for all of the other class. This is listed as a class to take the first semester.
The IT-190 is the building block to manufacturing, starting with 2D design and programming and providing a stepping stone to the intermediate IT-191 class for 3D modeling and programming, which leads to the 5-axis programming and machining in the advanced IT-192 class.

What is your departmental strategy on how you schedule your courses including the time of day you offer courses? Do you use fast track or block scheduling (putting required classes near each other) to organize required classes (Particularly to meet the needs of disproportionately impacted students)?
The new IT-105 will be offered as an 8 week course. It is a 1 hour lecture with a 1 1/2 hour lab, which is doable in 8 weeks. It will be offered in the day time. evening along with a summer class.
All of the other IT classes will be offered as full semester length classes alternating between day and evening classes.

 How do you work with other departments that require your course(s) for program completion?
For now it is fairly easy, I am the department chair and have had to coordinate 3 rooms with 3 other large disciplines. The hard part was that two of these disciplines did not have a full time instructors.

Does your discipline offer cross-listed courses?
Yes

How do you work with the other department(s) to ensure consistent curriculum per the COR and minimum qualifications? How do you coordinate course scheduling?
Since I am the other department, there is no problem with the COR and minimum qualifications. The only problem is that if I can't make class, there is nobody that is qualified to teach these courses. We are in the process of hiring a full time instructor for Industrial Technology to start this fall.
Realistically, I do work with the other departments and it is very difficult to schedule 4 disciplines into 3 rooms. As all four disciplines grow this is going to be more difficult to schedule classes.

Are there curriculum concerns that need to be resolved in your department? What are they?
In other areas I have instructors that do not want to learn anything new. They are out of touch with the real world applications and won't change or update their curriculum.

Are there courses that should be added or removed from your program - please explain?
Not in this discipline, right now. As we progress I can see changing some of the curriculum around, but for right now I think we have the correct classes in place.

How is the potential need for program/course deactivation addressed by the department?
Not in this discipline, but in my other ares we use Advisory Committee recommendations and conversations with other instructors.

Is your department pursuing non credit or not-for credit options at this time?
Yes

Are there areas you would like to expand?
Possibly the IT-105 class

Click here for information about [Noncredit](#) and [Community Education](#)

Is your department offering online classes?
Yes

How do you consider student needs when determining which classes and how many classes should be offered online versus face-to-face?
The IT-108 class is all on-line, and I have been thinking the blue print reading class could be on-line when we offer it.

Describe other data and/or information that you have considered as part of the evaluation of your program
The COE Market Analysis Reports.
The California State LMI report

CAREER AND LABOR MARKET DATA

The Chancellor's Office Vision for Success stresses the importance of increasing the percent of exiting students who report being employed in their field of study. It is important for us to consider how ***all*** of our programs connect to future careers.

Go to this website https://www.onetonline.org/ and enter your discipline in the bubble on the top right for ideas about potential occupations. Click on an example to see more detail.

The following websites are for CTE related data:

- [Centers of Excellence](#) (many other data resources besides supply and demand) Password: GetLMI

- [LaunchBoard](#)

- [LaunchBoard Resource Library](#)

- [Chancellor's Office Data Mart](#)

- [San Diego Workforce Partnership](#)

- [State of CA EDD](#)

- [Career One Stop](#)

What kinds of careers are available for people who complete your programs (and/or transfer)? (Refer to link above) Are there any new or emerging careers and if so how would the new or emerging careers impact your future planning?

1. CNC Machining: CAD CAM Programmer (Computer-Aided Design Computer-Aided Manufacturing Programmer), Computer Numerical Control Machine Operator (CNC Machine Operator), Computer Numerical Control Machining Center Operator (CNC Machining Center Operator), Computer Numerical Control Machinist (CNC Machinist), Computer Numerical Control Operator (CNC Operator), Computer Numerical Control Programmer (CNC Programmer), Machine Shop Lead Man, Machining Manager.

2. CNC Tool Operators: Brake Press Operator; Computer Numerical Control Lathe Operator (CNC Lathe Operator); Computer Numerical Control Machine Operator (CNC Machine Operator); Computer Numerical Control Machinist (CNC Machinist); Computer Numerical Control Mill Operator (CNC Mill Operator); Computer Numerical Control Operator (CNC Operator); Computer Numerical Control Set-Up and Operator (CNC Set-Up and Operator); Machine Operator; Machine Set-Up, Operator; Machinist. This Area has a "Bright Outlook".

3.Quality Control (Precision Measuring): Inspector, Quality Assurance Auditor, Quality Assurance Inspector, Quality Assurance Technician, Quality Auditor, Quality Control Inspector, Quality Control Technician, Quality Inspector, Quality Technician.

What are the associated knowledge, skills, abilities (KSA's) needed for the occupations listed above? (click examples in the link above to get ideas)

1. CNC Machining/Operating Knowledge:
   A.Computers and Electronics — Knowledge of circuit boards, processors, chips, electronic equipment, and computer hardware
      and software, including applications and programming.
   B. Mechanical — Knowledge of machines and tools, including their designs, uses, repair, and maintenance.
   C. Mathematics — Knowledge of arithmetic, algebra, geometry, calculus, statistics, and their applications.
   D. Production and Processing — Knowledge of raw materials, production processes, quality control, costs, and other techniques
      for maximizing the effective manufacture and distribution of goods.
   E. Design — Knowledge of design techniques, tools, and principles involved in production of precision technical plans, blueprints,
      drawings, and models.
2. CNC Machining/Operating Technical Skills:
   A. Computer aided design CAD software Hot technology — Autodesk AutoCAD; Dassault Systemes CATIA; Dassault Systemes
      SolidWorks Hot technology ; PTC Creo Parametric
   B. Computer aided manufacturing CAM software — 1CadCam Unigraphics; Autodesk PartMaker; Mastercam; Vero
   C. Object or component oriented development software — G code; M code
   D. Spreadsheet software — Microsoft Excel
3. Quality Control (Precision Measuring) Knowledge:
   A. Production and Processing — Knowledge of raw materials, production processes, quality control, costs, and other techniques
      for maximizing the effective manufacture and distribution of goods.
   B. Mathematics — Knowledge of arithmetic, algebra, geometry, calculus, statistics, and their applications.
   C. English Language — Knowledge of the structure and content of the English language including the meaning and spelling of
      words, rules of composition, and grammar.

4. Quality Control (Precision Measuring) Technical Skills:
   A. Analytical or scientific software — Design of experiments DOE software;Tolerance analysis software
   B. Computer aided design CAD software; Autodesk AutoCAD; Computer assisted design software;
Dassault Systemes CATIA
     SolidWorks
   C. Data base user interface and query software — Data entry software; FileMaker Pro; Microsoft
Access IBM Lotus Notes; IBM
    Microsoft Outlook Hot technology
    D. Industrial control software — Coordinate measuring machine software; Cybermetrics GAGETrak;
Statistical process control
    SPC data collection devices; Wilcox Associates PC-DMIS Inspection Planner

How does your program help students build these KSA's?
A. Software applications and Knowledge
 1. AutoCAD
 2. SolidWorks
 3. MasterCAM
 4. Creo
B. CNC Machine operation and Knowledge
 1. Water Jet Cutter
 2. Plasma Cutter
 3. Mills
 4. Lathe
C. Quality Control (Precision Measuring)
  1. CMM (Coordinate Measuring Machines)
  2. Dial calipers
  3. Micrometers
  4. Surface Plates and Height Gages
D. Blueprint Reading
  1. Orthographic Projection and types of Views
  2. Dimensioning and Tolerancing

Have you incorporated work based learning (work experience, internships, and/or service learning) into your program?
No

Do you want more information about or need assistance integrating work-based learning into your program?
No

How do you engage with the community to keep them apprised of opportunities in your program?
1. I hold yearly advisory committee meetings that local industry attends and makes recommendations.
2. I visit local machine shops and interview the lead supervisors to see if I am providing what they need for entry level employees.

What is the regional three-year projected occupational growth for your program(s)?
Centers of Excellent:
Growth trends in East San Diego County are behind that of the entire county, but overall, growth is expected. By the year 2016, East San Diego County is expected to see growth of less than 1% while the county as whole is expected to grow by 3.2%. East San Diego County employment projections for CNC Machining occupations are reflective of the entire county's overall growth trends.

What is being done at the program level to assist students with job placement and workforce

preparedness?
Right now I field calls and send qualified students out for interviews.

When was your program's last advisory meeting held? What significant information was learned from that meeting?
January 2018
Scheduled for April 2019

What are the San Diego County/Imperial County Job Openings?
Career One Stop seem to have the latest Data
The outlook for jobs in San Diego for the following:
CNC Machinist/Programmer 340 jobs projected
Machinist; 3,3770 jobs projected

Program Goals

In the previous sections, you identified opportunities for improvement. Using these opportunities, develop 3-year SMART goals for your department. Goals should be Specific, Measurable, Attainable, Relevant, Time-Specific. Ensure your goals align with the mission of your department and/or the College's strategic plan.

Please list all discipline goals for this three-year planning cycle. Click here for previous PRPs and goal information.

Goals

Goal 1

Brief Description
Build the Industrial Technology Program

Is this a new or existing goal?
New

How will you complete this goal?
1. Hiring a full time Industrial Technology Instructor.
2. Marketing by the school.
3. Get Palomar listed in the area schools that offer machining, CNC machine programming and Quality Control (Precision Measuring)

Outcome(s) expected (qualitative/quantitative)
More students that want to make this their career

How does this goal align with your department mission statement, the college strategic plan, and /or Guided Pathways?
1. We have the machinery to teach industry applications
2. We have the software and knowledge to teach industry applications
3. I have the actual work experience I needed to build this program, and I am ready to retire. Hopefully, we will get a energetic full time instructor for the fall and I can mentor him/her.

Expected Goal Completion Date
5/31/2020

STAFFING AND RESOURCE NEEDS

Instructions

1. Refer to Strategic Plan.
2. See Data.
3. See career info (In PRP)

Are you requesting additional full-time faculty?
Yes

Are you requesting additional Staff, CAST or AA?
No

In the last ten years, what is the net change in number of FT Faculty in the department? (FT faculty loss vs. gain)
There is n o full time faculty on staff right now. Classes are being taught by a full time professor from another discipline. We are in the process of hiring one for the fall, but the 5 applicants were not qualified.

% of FTEF for on-going reassigned time (department chair, program director, coordinator, etc.)

2016-2017 % FTEF (on-going reassigned time)	**2017-2018 % FTEF (on-going reassigned time)**	**2018-2019 % FTEF (on-going reassigned time)**
0%	0%	0%

% of FTEF for temporary reassigned time (grant activity, sabbaticals, leaves, other reasons)

2016-2017 % FTEF (temporary reassigned time)	**2017-2018 % FTEF (temporary reassigned time)**	**2018-2019 % FTEF (temporary reassigned time)**
0%	0%	0%

REQUEST FOR ADDITIONAL FULL-TIME FACULTY

Faculty Request 1

Title of Full-Time Faculty position you are requesting
Industrial Technology Instructor

How will this faculty position help meet district (Guided Pathways, Strategic Enrollment Management etc.), department and/or discipline goals?
Build the program and get students high paying entry level jobs.

Is there a scarcity of qualified Part-Time Faculty (for example: Specialized degree/experience, emerging/rapidly changing technology, high demand)
There is a scarcity of qualified full time instructors. If they are good at 5-axis programming they are making much more than we can pay them.

Are you requesting this position for accreditation, regulatory, legislative, health and safety requirements? Please explain.
No

Please summarize the discipline productivity, efficiency, and any regional career education needs for this discipline.

The job demand is there for student employment and we have everything in place.