

Instructional Program Review 2019/20 UPDATE

Engineering

**Created on: 08/28/2019 03:37:00 PM PST
Last Modified: 01/10/2020 01:22:41 PM PST**

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General Information (Instructional Program Review 2019/20 UPDATE)

2019/20 Instructional Program Review

SUBMISSION INFORMATION AND UPDATES (REQUIRED)

- Name of Lead Writer: Morteza Mohssenzadeh
- Name of Liaison: Valerie Abe
- Department Chair: **Donald Barrie**
- Name of Manager/Service Area Supervisor: Susan Topham
- Is this a CTE program? (State Yes or No): No

OUTCOMES AND ASSESSMENT (REQUIRED)

Form: 2019/20 Program Review Outcomes and Assessment Section (See appendix)

PROGRAM ANALYSIS FOR EQUITY AND EXCELLENCE (REQUIRED)

Form: 2019/20 Program Review Instructional Program Analysis Section (See appendix)

PROGRAM GOALS (REQUIRED)

Engineering Goal Set 2018-2019

Engineering Tutoring

This goal involves finding a qualified individual to work at Mesa's Tutoring Center to assist engineering students with course related assignments and projects.

Mapping

CA- Mesa College Strategic Directions and Goals: Strategic Goal 1.1,

Institutional Learning Outcomes 2016/17: Communication, Critical Thinking, Global Consciousness, Professional & Ethical Behavior

Connecting students with the local industries

Elevating students to industries with critical workforce needs and by preparing and educating all students to serve a multicultural society.

Mapping

CA- Mesa College Strategic Directions and Goals: Strategic Goal 1.2, Strategic Goal 1.3, Strategic Goal 1.4, Strategic Goal 1.6, Strategic Goal 2.2, Strategic Goal 3.2, Strategic Goal 3.3

ACTION PLANS FOR GOALS (REQUIRED)

Actions

Engineering Goal Set 2018-2019

Goal

Goal: Engineering Tutoring

This goal involves finding a qualified individual to work at Mesa's Tutoring Center to assist engineering students with course related assignments and projects.

Action: Engineering tutors

Describe the actions needed to achieve this objective:

Work with STEM center to fund the qualified tutors to help engineering students outside the class room.

Who will be responsible for overseeing the completion of this objective:

Engineering Professor

Provide a timeline for the actions:

Fall 2019

Describe the assessment plan you will use to know if the objective was achieved and effective:

- 1, Hiring the tutors
2. Improving the course success

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):

The resources will be the funding for tutors as well as ESU for the faculty mentor

Goal: Connecting students with the local industries

Elevating students to industries with critical workforce needs and by preparing and educating all students to serve a multicultural society.

Action: Connecting students with the local industries

Describe the actions needed to achieve this objective:

1. work with the local industries to hire our students for the summer internship
2. Ask the former students to mentor our current students and to provide needed information to make this goal possible and successful.

Who will be responsible for overseeing the completion of this objective:

The Engineering faculty will collaborate with the career center and the local industries to facilitate this objective.

Provide a timeline for the actions:	2020-2021
Describe the assessment plan you will use to know if the objective was achieved and effective:	By collecting data for those that successfully obtained the internship with the local firms.
List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):	No resources are required

GOAL STATUS REPORT (REQUIRED)

Action Statuses

Engineering Goal Set 2018-2019

Goal

Goal: Engineering Tutoring

This goal involves finding a qualified individual to work at Mesa's Tutoring Center to assist engineering students with course related assignments and projects.

Action: Engineering tutors

Describe the actions needed to achieve this objective:	Work with STEM center to fund the qualified tutors to help engineering students outside the class room.
Who will be responsible for overseeing the completion of this objective:	Engineering Professor
Provide a timeline for the actions:	Fall 2019
Describe the assessment plan you will use to know if the objective was achieved and effective:	1, Hiring the tutors 2. Improving the course success
List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software,	The resources will be the funding for tutors as well as ESU for the faculty mentor

**Facilities, Classified Staff,
Faculty, Other):**

Status for Engineering tutors

Current Status: Completed

If the Current Status was marked Completed, what was the impact of the completed objective on your program:

The impact of the completed objective was a clear improvement on students learning and success and doing better in passing the course.

If the Current Status was not marked Completed, what are the implications and next steps:

Goal: Connecting students with the local industries

Elevating students to industries with critical workforce needs and by preparing and educating all students to serve a multicultural society.

Action: Connecting students with the local industries

Describe the actions needed to achieve this objective:

1. work with the local industries to hire our students for the summer internship
2. Ask the former students to mentor our current students and to provide needed information to make this goal possible and successful.

Who will be responsible for overseeing the completion of this objective:

The Engineering faculty will collaborate with the career center and the local industries to facilitate this objective.

Provide a timeline for the actions:

2020-2021

Describe the assessment plan you will use to know if the objective was achieved and effective:

By collecting data for those that successfully obtained the internship with the local firms.

List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):

No resources are required

Status for Connecting students with the local industries

Current Status:

Not started

If the Current Status was marked Completed, what was the impact of the completed objective on your program:

If the Current Status was not marked Completed, what are the implications and next steps:

No significant implication at this time as this goal being addressed based on individual students requesting assistance to be place in summer internship. Going forward the plan is to expand this goal in a larger scale.

Request Forms

CLASSIFIED POSITION, BARC AND FACULTY POSITION REQUEST

Reviewers

LIAISON'S REVIEW

Form: Instructional Program Liaison's Review 2019/20 UPDATE

MANAGER'S REVIEW

Form: Instructional Program Manager's Review 2019/20 UPDATE

Appendix

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- A. **2019/20 Program Review Outcomes and Assessment Section** (Form)
 - B. **2019/20 Program Review Instructional Program Analysis Section** (Form)
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Form: "2019/20 Program Review Outcomes and Assessment Section"

Created with : Taskstream

Participating Area: Engineering

(REQUIRED) Program name

Engineering

(REQUIRED) Are you on target with your assessment schedule?

Yes. The schedule assessment attached is the clear indication that we are on target with the assessment.

(REQUIRED) What have your assessments revealed about your courses/programs/service area/school/division/office?

For the most part, we have determined that students are meeting the target levels for success that we have set. However, there are still some areas of concern regarding student success in a particular courses and success for certain ethnicities. The sole Engineering Faculty is aware of the challenges and he is using various techniques and tools such as once a month workshops in and outside of the classroom to close the gaps. One thing that was successful in helping students to achieve better success was the creation of Engineering success club that is run and organized by Mesa College engineering students. Also we have additional club called SHPE (Society of Hispanic Professional Engineering). The SHPE Club has 25 members that have weekly meeting at the STEM center and they provide support to their fellow classmates by offering free tutoring and workshops. We have implemented Peer mentoring for engineering 200 which has been very successful and helpful. Many of our students are now using this opportunity to get additional help outside the class by attending the peer mentoring sessions twice a week.

(REQUIRED) Based on your assessments, what resource needs have you identified?

As stated in previous question, we had some good success with the offering of faculty and student led workshops. Without providing funding to faculty, however, it is likely that we can continue to offer these supports to our students. Also full-time faculty is continuing to offer discussion sessions, review sessions, and even some study skills workshops to assist students outside of the classroom. The only resources needed are to hire qualified peer mentor to assist engineering students on their projects and homework. Also to hire more part time or possibly additional full time faculty as the program is growing and we are in need of offering more sections of engineering courses.

Please provide any other comments.

The engineering program at Mesa College is focusing on offering more engineering courses as demand for the lower division courses at Mesa College has increased. In order for our students to transfer on time as indicated on the guided pathways we need to offer more engineering classes every semester as well as in the summer session. Through the SDCCD collaborative support of the Pipeline Project engineering program is committed to participating in the effort to increase the number of engineers graduated from local colleges. Consequently, the Engineering Program promotes regional economic growth by adding technical leaders who were enabled by their community college experience. Engineering

education in San Diego promotes regional economic development by partially satisfying the employment needs of local high technology companies.

Mesa College currently offer a comprehensive core engineering courses that prepares students to transfer with full junior standing to four-year engineering colleges and universities in California and across the United States. This program is an integral part of Mesa's transfer mission and is highly respected by the four-year engineering colleges throughout California.

Form: "2019/20 Program Review Instructional Program Analysis Section"

Created with : Taskstream

Participating Area: Engineering

Program Name

(REQUIRED) Type your program name.

Engineering

Part A: In this section, please analyze your program in terms of course success metric. Start by disaggregating the available data by race, gender, and any other parameters of interest to your program and answer the following questions.

(REQUIRED) A1. What patterns do you notice with regard to equity in course success at the program level by race/ethnicity?

You may also conduct analysis by course and/or by modality.

Equity Gap: When a group of students who share a common characteristic (e.g. race/ethnicity) have lower access and/or outcome rates than their peers. The size of the equity gap along with the size of the group determine whether that gap is significant. Larger groups should, statistically, have smaller gaps and therefore when gaps are present (even small ones) they may be significant. Smaller groups will see wider variation in outcomes, therefore gaps should be seen consistently over time and/or reviewed by looking at multiple years in aggregate to determine if they are significant.

This focus contributes to the College' goals of reducing equity gaps by exposing our new faculty to a nurturing environment in which they are properly mentored, thus presenting our best practices in understanding and addressing diversity amongst our student population. Understanding our students and their needs often comes with time and after discussion with colleagues who can share their own experiences over the years. This requires a willingness to accept feedback and make adjustments in one's teaching style over the course of their time with us. One can begin to reduce the equity gaps that exist amongst our students only when open to change and to new ideas through collaboration. Even an individual who is very sensitive to the needs of our diverse community college population finds that he/she learns something new or encounters an obstacle to overcome throughout the course of his/her tenure. Through our efforts, we hope to spark innovation in teaching and greater sensitivity to their students.

The Annual Program Outcomes by Ethnicity indicates that the success rate in fact has increased for almost all ethnicity groups except for African American which is about 67% with equity gap of 8%. Latino course success rate is about 70% with equity gap of 5%. Other ethnicities that tend to perform at high rates of success in fact perform lower at 67% with equity gap of negative 8%. Asian Pacific Islander 80%, Filipino 75%, and White 80%. Success rate by gender indicate that female has performed almost the same as male with 1% equity gap. The success rate With respect to the age group between 40-49 is about 84% higher than in other age group. In the coming semester working with our new

faculties and making sure that they are properly trained and mentored with sensitivity, encouragement, as well as with rigor, is one crucial way in which we feel we can help significantly reduce this equity gap.

(REQUIRED) A2. Do these patterns persist over time (e.g., look at the last five years)? Describe if equity gaps are increasing, decreasing, or staying the same?

Looking at the last five years the equity gaps for the engineering program remain the same except for the returning transfer student has decreased to about 18%.

Course success rate has increased for all engineering courses being offered in the last five years except for Statics and Dynamics.

(REQUIRED) A3. What factors may have influenced these results? What are your most significant findings?

The factors that influenced these results could be that most of our students have part time job and most of our students are not strong in Math and Science as a prerequisite for all engineering courses. Combination of these two factors have significantly influenced on their class performance. Also the most significant findings is that our engineering students have not been challenged enough in the prerequisite courses and upon taking the first engineering course ENGE 200 which is the foundation course for most engineering fields. The results has shown the poor performance on the first exam, but as we provide them with proper tools their learning outcome has improved.

(REQUIRED) A4. How have you/might you alter practices to increase student success and reduce equity gaps?

In the fall 2019 semester we have hired through the STEM a peer mentor that meets with students specifically for Enge 200 twice a week. Having the peer mentor has helped students performance on the exam by about 75%. We are going to pursue the same approach and increase the number of tutors in the spring of 2020. It seems like having outside the class help did in fact increased student success and reduce the equity gaps.

(REQUIRED) A5. How does your program contribute to the College's identity of being a Hispanic Serving Institution?

San Diego Mesa College has made great strides toward becoming a Hispanic-Serving Institution (HSI). With 38% full-time Latinx student enrollment as of spring 2019, we are considered as an outstanding Emerging HSI. This puts us beyond our goal of at least 25% full-time Latinx enrollment, making us over qualified for HSI designation by the U.S. Department of Education. Additionally, as a renowned research institution with a strong STEM (Science, Technology, Engineering, and Math) focus, San Diego Mesa College aims to become a model STEM HSI. Based on the data available 32% of latinx were enrolled in engineering program in the fall 2018. The engineering program at Mesa attracted many students of Hispanic background since 2005. The engineering program also started the SHPE engineering club (Society of Hispanic Professional Engineering) at Mesa College that is actively involved in an outreach program by visiting local high schools to encourage students to participate in engineering activities. One of these activities include the "Walk On Water" competition that has students collaborate in groups to create various structural designs that provides a practical and enjoyable experience in understanding the fundamental aspects of engineering. This activity in particular is special as it allows students

to compete alongside several other high schools, community colleges and even 4-year institutions such as USD and SDSU.

(REQUIRED) A6. Have you identified resource needs? If yes, please list.

We do know that the Latino population and the number of Latino college-bound students will, in all likelihood, continue to grow. Thus, there is a clear need for further research and analysis on Hispanic-Serving Institution (HSI), its work, its impact and their students. Given that HSI is a relatively new construct there is not yet a full body of research or literature on this topic. For instance, we know little of the experience of Latino students at HSIs and what, if any, initiatives HSIs are implementing that help serve this group of students. To further increase the effectiveness of HSIs, we have argued for the following considerations:

- Recognize the need for technical assistance to help latino students appropriately and effectively
- Filling the Gaps in Understanding for Spanish-Speaking Students: Mentors with the capability of speaking in spanish would be highly handfull to improve the understanding of latian students.
- One of the foundational thing is providing good data—and useful data—to teachers and administrators to help them understand their hisapnic students’ learning.
- In all of our classrooms, it is clearly found it a challenge to really know what our students could do and how to simultaneously support their academic and language needs. The classroom is a place of immense diversity: learning styles, linguistic and cultural backgrounds, and language proficiency levels.

(REQUIRED) A7. Do any of your program goals address these implications or needs? If not, please develop a new goal that addresses your findings and subsequent reflection.

It would be extermly great if we fulfill our Hispanic Serving mission by elevating students to industries with critical workforce needs and by preparing and educating all students to serve a multicultural society

Part B: In this section, look at the area of focus you identified in last year's program review and answer the following questions.

(REQUIRED) B1. How have you developed this focus? Are you seeing any results? What are your next steps?

The engineering program at Mesa College is focusing on offering more engineering courses as demand for the lower division courses at Mesa College has increased. In order for our students to transfer on time as indicated on the guided pathways we need to offer more engineering classes every semester as well as in the summer session. Through the SDCCD

collaborative support of the Pipeline Project engineering program is committed to participating in the effort to increase the number of engineers graduated from local colleges. Consequently, the Engineering Program promotes regional economic growth by adding technical leaders who were enabled by their community college experience. Engineering education in San Diego promotes regional economic development by partially satisfying the employment needs of local high technology companies.

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During the spring and the fall semester of 2019 engineering program offered two more new courses that enabled students to transfer to a four year institutions.