Work Plan 2021-2022
August 21, 2021
Revised: October 14, 2021
James McGarrah, Associate Dean of Instruction
Physical Science, Engineering, Energy, and Department of Education Title III Part F HSI-STEM Grant

Vision for Success Goal #1:
Increase by at least 20 percent the number of CCC students annually who acquire associates degrees, credentials, certificates, or specific skill sets that prepare them for an in-demand job.

- Strategic Initiative 1 - Student Learning
- Strategic Initiative 2 - Student Progression and Completion

Work Plan
Increase STEM student momentum point attainment.

<table>
<thead>
<tr>
<th>STEM Pathway Momentum Points</th>
<th>2019</th>
<th>2020</th>
<th>2021 Goal</th>
<th>2022 Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 units in 1st semester</td>
<td>20.0%</td>
<td>18.5%</td>
<td>22.2%</td>
<td>25.9%</td>
</tr>
<tr>
<td>30 units in 1st year</td>
<td>19.1%</td>
<td>16.0%</td>
<td>19.2%</td>
<td>22.4%</td>
</tr>
<tr>
<td>ENGL B1A completion in 1st year</td>
<td>34.9%</td>
<td>29.0%</td>
<td>34.8%</td>
<td>40.6%</td>
</tr>
<tr>
<td>Transfer math completion in 1st year</td>
<td>26.2%</td>
<td>21.4%</td>
<td>25.7%</td>
<td>30.0%</td>
</tr>
</tbody>
</table>

Increase STEM degree completions.

<table>
<thead>
<tr>
<th>STEM Degree Completions</th>
<th>2019</th>
<th>2020</th>
<th>2021 Goal</th>
<th>2022 Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology AS and AS-T</td>
<td>35</td>
<td>23</td>
<td>35</td>
<td>46</td>
</tr>
<tr>
<td>Chemistry AS and AS-T</td>
<td>5</td>
<td>0</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Computer Science AS-T</td>
<td>20</td>
<td>32</td>
<td>35</td>
<td>38</td>
</tr>
<tr>
<td>Engineering AS</td>
<td>15</td>
<td>18</td>
<td>18</td>
<td>22</td>
</tr>
<tr>
<td>Geology AS-T</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Mathematics AS and AS-T</td>
<td>44</td>
<td>35</td>
<td>40</td>
<td>45</td>
</tr>
<tr>
<td>Physics AS-T</td>
<td>33</td>
<td>23</td>
<td>24</td>
<td>28</td>
</tr>
<tr>
<td><strong>All STEM</strong></td>
<td><strong>152</strong></td>
<td><strong>132</strong></td>
<td><strong>158</strong></td>
<td><strong>185</strong></td>
</tr>
<tr>
<td><strong>Unique Headcount of awards</strong></td>
<td><strong>94</strong></td>
<td><strong>98</strong></td>
<td><strong>118</strong></td>
<td><strong>140</strong></td>
</tr>
</tbody>
</table>

Improve faculty FTES and resources to improve discipline FTES.

<table>
<thead>
<tr>
<th>Discipline (Annual FTES)</th>
<th>2019-20</th>
<th>2020-21</th>
<th>2021-22 Goal</th>
<th>2022-23 Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTR</td>
<td>40.0</td>
<td>35.3</td>
<td>24.0</td>
<td>30.0</td>
</tr>
<tr>
<td>BIOL</td>
<td>700.8</td>
<td>1005.8</td>
<td>1100.0</td>
<td>1400.0</td>
</tr>
<tr>
<td>CHEM</td>
<td>316.1</td>
<td>383.0</td>
<td>395.0</td>
<td>422.2</td>
</tr>
<tr>
<td>ENGR</td>
<td>72.4</td>
<td>98.5</td>
<td>84.0</td>
<td>90.5</td>
</tr>
<tr>
<td>ERSC</td>
<td>84.9</td>
<td>89.7</td>
<td>94.2</td>
<td>99.6</td>
</tr>
<tr>
<td>GEOG</td>
<td>79.1</td>
<td>75.3</td>
<td>78.8</td>
<td>82.3</td>
</tr>
</tbody>
</table>
Improving the following processes will ensure students stay on the path to progression and completion and improve FTES.

- **Enrollment Management Strategies**
  - Increase Health Science pre-req science course capacity
    - Develop a new biology and chemistry faculty recruiting plan to increase foundational FTEF needed to generate FTES in conjunction with Dean Waller
  - Improve rural, inmate, and BS Southwest STEM course and program options
    - Work with the Inmate Scholars team to provide foundational courses for the completion of the BSIA program and others, including courses such as PHSC B12.
  - Improve communications to STEM students (Get on the Path. Stay on the Path)
    - Use Ocelot to text students as to highest priority courses needed to get on their pathway and meet momentum points.
    - Develop plan to reassign students when taking classes as “apparent STEM majors” but officially listed as a different major.

- **VS Energy Initiative**
  - Develop Geospatial Technologies and Drone program – cross disciplinary program whose natural home is Geography which is current in the Physical Science Department
    - Convene community/industry GIS professionals to access the need for the program.
    - Assemble a curriculum development group
    - Set goal of submitting first class(es)
    - Work towards building a certificate of achievement
  - Energy Curriculum planning – cross disciplinary program between ITT and STEM pathways
    - Develop certificates for Energy that are general / STEM specific / HVAC and Electronics technical education
    - Establish an Energy Curriculum Taskforce [Paul Murray, Jason Dixon, Devin Daugherty (DO/Communication)] through Academic Senate
    - Submit STEM B20 – Introduction to Energy
    - Develop an associate degree in Energy Technology with plans that can lead to a potential bachelor’s degree.

**Vision for Success Goal #2:** Increase by 35 percent the number of CCC students transferring annually to a UC or CSU.

Strategic Initiative 1 - Student Learning
Strategic Initiative 2 - Student Progression and Completion

**Work Plan**
Improving the following processes will ensure students stay on the path to progression and completion

- Develop new “Grow our own” program with CSUB and UC Merced
  - Increase transfer to CSUB and UC STEM programs through summer research experiences.
• Complete work of "Increasing STEM Flow and Success Along Intersegmental STEM Pathways" a CELL Grant funded from 07/01/2020 – 06/30/2022. PI – Craig Hayward, co-PI – James McGarrah, co-PI – James Zimmerman (UC Merced).
  o Continue work on intersegmental alignment with the Program Mapper for programs to UC Merced.
  o Pilot STDV B8 – UC Transfer Experience course (Ryan Huynh from Counseling was the instructor the Fall 2021.)
  o Convert PHSC B8 to STEM B8 – UC STEM Transfer Experience and attempt first offering in Spring of 2021.

• Get the HSI-STEM grant started. Department of Education HSI-STEM Title III Part F grant. Step Up to STEM: Start Strong, Stay Strong, Finish Strong, $1,000,000 per year, grant period: 10/1/2021 – 9/30/2026. This project attempts to build student persistence, growth, less units towards degree, and enhance transfer/degree completion in STEM.
  o Awarded Sept. 17
    ▪ Approval of grant by board of trustees
    ▪ Approval/adjust budget
    ▪ Set-up an account (by Dec. 1)
  o Assemble team and finalize roles from the proposal (Fall 2021)
    ▪ Project Director: James McGarrah
    ▪ Activity Director: Jason Dixon
    ▪ Experiential Learning Coordinator: Consuelo Gonzalez
    ▪ STEM Hub Coordinator: TBD, from the currently advertised Program Manager, Student Success and Energy STEM
    ▪ STEM Academy Co-Developer: Laurel Mourtzanos
    ▪ STEM Academy Co-Developer: Jesus Oropeza
    ▪ SSGL Faculty Developer: Donna Star

• Move STEM Academy from pilot to a program that has the goal of reaching 50% of 1st time STEM students.
  o Implement and scale the STEM Academy from the summer 2021 pilot
  o Train STEM Hub Coordinator to manage and grow this program
  o Develop unit bearing course using the STEM prefix to make institutionally sustainable through credit or noncredit course offering.

• STEM Study Group Leaders, SSGL
  o Organizer for 2021-22 will be Connie Gonzalez with help from Donna Star (40% FTE release).
  o Transition the operation of the program to STEM Hub Coordinator for 2022-23.
  o This activity aligns with completion support in math in the VPI's work plan

• Joint faculty/student research exchange with CSUB – Step Up to STEM
  o Organizers for 2021-22 will be Connie Gonzalez/Jason Dixon
  o Develop the details for the Experiential Learning Coordinator to support these efforts

• Develop STEM 101 – Pathway Introduction – STEM B17 is my preferred course number
  o Model class based on HSCI B17 and ENGR B47
  o J. Dixon, J. Oropeza, L. Mourtzanos,
  o Recruit STEM Faculty Ambassadors to teach the class. Biology faculty (TBD), Physical Science faculty (TBD), Computer Science faculty (TBD) and Math faculty(TBD)
Vision for Success Goal #3: Decrease the average number of units accumulated by CCC students earning associate degrees, from approximately 87 total units (the most recent system wide average) to 79 total units—the average among the quintile of colleges showing the strongest performance on this measure.

Strategic Initiative 1 - Student Learning
Strategic Initiative 2 - Student Progression and Completion

Work Plan
Improving the following processes will ensure students stay on the path to progression and completion

- Increase directed communications to STEM students with high unit counts
  - Use KCCD data systems to identify STEM students with high unit count and use Ocelot to text them with directions for counseling.
  - Organize the STEM Completion Coach Community for targeted messaging throughout the semester

- Develop STEM 101 – Pathway Introduction – STEM B17 is my preferred course number.
  - Model class based on HSCI B17 and ENGR B47
  - J. Dixon, J. Oropeza, L. Mourtzanos, Biology faculty (TBD), Physical Science faculty (TBD), Computer Science faculty (TBD) and Math faculty(TBD)

Vision for Success Goal #4: Increase the percent of exiting CTE students who report being employed in their field of study, from the most recent statewide average of 60 percent to an improved rate of 69 percent—the average among the quintile of colleges showing the strongest performance on this measure.

Strategic Initiative 1 - Student Learning
Strategic Initiative 2 - Student Progression and Completion

Work Plan
Improving the following processes will ensure student learning and hands-on experience in chosen field of study

- Provide enhanced non-credit math support through pathways-focused sections and support sessions.
- Use summer Math Bootcamps to provide college preparation (CDCP) relevant to student's pathway.

Vision for Success Goal #5: Reduce equity gaps across all of the above measures through faster improvements among traditionally underrepresented student groups, with the goal of cutting achievement gaps by 40 percent within 5 years and fully closing those achievement gaps for good within 10 years.

Strategic Initiative 1 - Student Learning
Strategic Initiative 2 - Student Progression and Completion

Work Plan
Improving the following processes will ensure students stay on the path to progression and completion of momentum points and close achievement gaps by improving faculty engagement through the STEM Completion Coaching Community and engaging a learning community of STEM Faculty Ambassadors.

Strategic Direction #4 – Leadership and Engagement
Work Plan

Improving the following processes will ensure that the Guided Pathways framework is at the heart of everything we do at BC

- Improve STEM Pathway communication and sustainability
  - Develop faculty culture of involvement in the STEM Completion Coaching Community
  - Update STEM webpage.
- Engage faculty through Step Up to STEM and the MESA program to adopt the “servingness” model
  - Recruit first cohort of STEM Faculty Ambassadors as a part of the Step Up to STEM
  - Work with the MESA Director to recruit new faculty participation with MESA.