NAME OF COLLEGE: Modesto Junior College

CONTACT: Pedro Mendez, Dean of CTE, Community & Workforce Development

PHONE NUMBER: 209.575.6332

EMAIL ADDRESS: mendezp@mjc.edu

DATE: 12/11/15

Division: Agriculture and Environmental Sciences (Dean: Don Borges)

Faculty: Steve Amador, Instructor of Agriculture

PROGRAM NAME: Irrigation Design

☐ New Program Proposal    ☐ Program Revision Proposal

TYPE OF DEGREE:

☒ Certificate
☐ Associate of Arts
☐ Associate of Science
☐ Associate of Arts for Transfer
☐ Associate of Science for Transfer
☐ Other

ATTACHMENTS REQUIRED:

Labor/Job Market Data and Analysis
Advisory Committee Meeting Minutes
Employer Survey

A. Appropriateness to Mission
Statement of Program Goals and Objectives

Identify the goals and objectives of the program. For CTE programs, the statement must include the main competencies students will have achieved that are required for a specific occupation. The statement must, at a minimum, clearly indicate the specific occupations or fields the program will prepare students to enter and the basic occupational competencies students will acquire.

The goal of the Irrigation Technology program is to increase the number, preparation and technical expertise of irrigation technicians and designers who are prepared to improve agriculture water management, increase irrigation delivery system efficiency, and enhance on-farm water conservation. Principle Investigators will work closely with industry experts to identify technology and critical skills that are needed in the field. Water is arguably the most valuable resource in the Central Valley. The distribution and maintenance of clean water impacts every industry in the Valley. Agriculture is the largest consumer of fresh water, accounting for 79.9% of water use compared to 4.3% for domestic use. The Water sector provides economic vitality to the Valley and is a critical component of public health and overall daily life. (source: Center of Excellence, Water Sector Profile 2013). The severity of the California drought combined with the agriculture-based economy in the Central Valley moved faculty and irrigation experts to design a state-of-the-art irrigation technology program. Precision irrigation strategies will be developed and taught to meet new water regulations established in the state.

The water sector is heavily reliant on technology to increase efficiency and effectiveness. Over the last several years, evolving technology has changed the way industries that use water must operate, thereby impacting skill requirements of technicians. They must be able to deliver water where and when it is needed. To address the education and skill needs of the industry, two specific objectives are developed to achieve the project goal of preparing technicians: 1) Develop and deliver standardized curriculum that advances the efficient design and use of irrigation systems and can be replicated at other institutions. 2) Create a pipeline of skilled, certified technicians that meet current conservation, efficiency and water management regulations.

We have worked with irrigation experts to develop a program that meets the technical and certification needs of the industry. Modesto Junior College (MJC) sits in Stanislaus County in the heart of California’s Central Valley, a region that is 26,000 square miles of some of the richest agricultural soil in the world. In spite of the ideal growing environment, California’s agricultural operations are struggling as the state experiences one of the worst droughts in its history. The impact is so severe that more than 400,000 acres of normally productive acreage sits fallow this year. Many of the farmers still operating use the old surface irrigation methods of their grandfathers, wasting significant amounts of water with each irrigation. New technology has created a skills gap as it develops more quickly than the industry can keep up with. Irrigation efficiency and water conservation are critical, creating a need for irrigation technicians with state-of-the-art skills. Technology that
enables remote monitoring, precise irrigation designs and projections, and increased water conservation will be embedded in this new program.

Program Learning Outcomes: Upon completion of the degree, students will be able to do the following:

1. Collect site data in regards to size, soil type, elevation differences, crop water needs, and water source in order to provide irrigation system recommendations.
2. Design a sprinkler irrigation system that is consistent with industry standards.
3. Accurately draw an irrigation system using AutoCAD software which is considered the industry standard.

• Catalog Description

Enter exactly as it will appear in the catalog, including program outcomes. The description must also

• Convey the certificate’s goals(s) and objectives
• Provide an overview of the knowledge and skills that students who complete the requirements must demonstrate (student learning outcomes)
• List all prerequisite skills or enrollment limitations
• Mention any risks, such as occupations that are inherently competitive or low-salaried and/or occupational areas where inexperienced graduates are not generally hired.
• For CTE programs, the description must list the potential careers students may enter upon completion.
• Convey what the student may expect as an outcome

This program will prepare students for jobs in irrigation design. Training and skill development include; AutoCAD fundamentals, system hydraulics, site development and material selection. Contact the division office in the Agriculture Building for advising assistance.

• Program Requirements

The program requirements must be consistent with the catalog description. The number of units, specific course requirements and the sequence of the courses must be coherent, complete and appropriate. Display the program requirements in a table format that includes all courses required for completion of the program (core requirements and required or restricted electives), subtotal of core units, and total program units. For each course, indicate the course department number, course title, and unit value.
Display of Program Requirements

<table>
<thead>
<tr>
<th>Core Courses</th>
<th>Title</th>
<th>Semester Sequence</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGEC 225</td>
<td>Agriculture Computer Applications</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>AGM 235</td>
<td>Irrigation and Drainage</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>AGM 237</td>
<td>Irrigation Wells, Pumps and Drive Systems</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>AGM 238</td>
<td>Irrigation System Design</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Units</strong></td>
<td></td>
<td></td>
<td><strong>12</strong></td>
</tr>
</tbody>
</table>

- **Background and Rationale**

Given the stated goals and objectives, address the role the proposed program will fulfill in the college’s mission and curriculum offerings. This discussion may include some history of the program proposal origins, a description of the program purpose, and/or the program’s relevancy for the region and college.

The proposal must demonstrate a need for the program that meets the stated goals and objectives in the region the college proposes to serve with the certificate. A proposed new certificate must not cause undue competition with an existing program at another college.

The Modesto Junior College Agriculture Department has received several grants to assist in the development of the Irrigation Technician program. With state drought relief funding along with a grant from the National Science Foundation, we have been able to begin development of lab facilities and equipment. Current grant funding is just under $900,000. In addition to laboratory facilities and equipment, we have begun delivering the first irrigation course and are presently teaching our first cohort in Irrigation Technology. Presently there are 22 students enrolled in the first cohort and we look for enrollment and course offerings to increase in the upcoming semesters. The goal is to graduate our first group of students in the spring of 2017 and continue to supply the industry with needed technicians for years to come.

The Irrigation Design Certificate prepares students for jobs in irrigation design. Training and skill development include; AutoCAD fundamentals, system hydraulics, site development and material selection.
B. Need for Program

- **Enrollment and Completer Projections**

  *This item should address and justify the number of projected students or “annual completers” to be awarded the certificate each year after the program is fully established.*

<table>
<thead>
<tr>
<th>CB 01: COURSE DEPTNO</th>
<th>CB 02: COURSE TITLE</th>
<th>SECTIONS OFFERED (ANNUAL)</th>
<th>ENROLLMENT TOTAL (ANNUAL)</th>
<th>SECTIONS OFFERED (ANNUAL)</th>
<th>ENROLLMENT TOTAL (ANNUAL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGEC 225</td>
<td>Agriculture Computer Applications</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>AGM 235</td>
<td>Irrigation and Drainage</td>
<td>2</td>
<td>45</td>
<td>3</td>
<td>75</td>
</tr>
<tr>
<td>AGM 237</td>
<td>Irrigation Wells, Pumps and Drive Systems</td>
<td>1</td>
<td>22</td>
<td>1</td>
<td>25</td>
</tr>
<tr>
<td>AGM 238</td>
<td>Irrigation System Design</td>
<td>1</td>
<td>22</td>
<td>1</td>
<td>25</td>
</tr>
</tbody>
</table>

* Denotes agriculture foundational courses required for multiple degrees. Irrigation Technology students will enroll in these courses along with students from other programs.

- **Place of Program in Curriculum/Similar Programs**

  *Review the college’s existing program inventory, then address the following questions:*

  - Do any active inventory records need to be made inactive or changed in connection with the approval or the proposed program? If yes, please specify.
  - Does the program replace any existing program(s) on the college’s inventory? Provide relevant details if this program is related to the termination or scaling down of another program(s).
  - What related programs are offered by the college?

The proposed certificate is part of the Irrigation Technology program at MJC is independent and unique to the campus; there are no other similar programs or programs with similar curriculum.

<table>
<thead>
<tr>
<th>AS Degree Irrigation Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certificate: Irrigation Technology</td>
</tr>
</tbody>
</table>
• **Similar Programs at Other Colleges in Service Area**

Describe all similar programs offered by colleges within the college service area. If the proposed program has a different emphasis than similar programs at other colleges, targets a different market, demonstrates state-of-the-art offerings, or for a number of reasons will be a stronger program, documentation and/or explanation need to be provided.

The MJC Irrigation Program is the only production agriculture certificate program presently offered in California. Outside of our service area, West Hills Coalinga is developing an Irrigation Manager or Installation Technician Certificate which may include design elements; however, this program is more than two hours away. Several community colleges in the state offer classes in irrigation technology (most with an emphasis in residential and urban water use), but none offer a series of courses that lead to certificate.

• **Labor Market Information and Analysis**

Current labor market information and analysis, or other comparable information, must show that jobs are available for program completers within the local service area of the individual college and/or that job enhancement or promotion justifies the proposed curriculum.

Enter table, chart or narrative as a separate attachment.

Please See Attachment

• **Employer Survey**

Discuss in this area, or as a separate attachment, employer input in regard to necessity of program and number of jobs available.

Faculty does not believe a survey is needed. Much work has been done via the local advisory committee and research work through the National Science Foundation Grant associated with skill trends for Agriculture Irrigation Specialist associated occupation duties and skills.

• **Explanation of Employer Relationship**

Whenever a program is to be offered in close cooperation with one or more specific employers, a discussion of the relationship must be provided.

The Irrigation Design Certificate of Achievement follows Title 5, section 51006 requirements. It is designed for student interested in obtaining skills and preparation for employment in the industry. Local employers serve on the advisory committee, offer internship and employment placement sites and support the program via donation of (a) time in class as guests, (b) support of site field trips, (c) supplies, technology and equipment and (d) outreach support.
• **List of Members of Advisory Committee**

*This list must include advisory committee member names, job titles, and business affiliations.*

Steve Amador – Modesto Junior College  
Donald Borges – Modesto Junior College  
Jenni Abbott – Modesto Junior College  
Elizabeth Orozco-Wittke – Modesto Junior College  
Darren Aldaco – Eurodrip USA  
Dominick Amador – RMC Water  
Ray Azevedo – JM Equipment  
Tim Boyd – Retired Irrigation Designer  
Alex Buenrostro – Turlock Irrigation District  
Caitie Campodonico – East San Joaquin Water Coalition  
John Davids – Modesto Irrigation District  
Sam Terpstra – Oakdale Irrigation District  
Jake Wenger – Local Grower  
Jason Word – Turlock Irrigation District

• **Recommendation of Advisory Committee**

*In a separate attachment, provide minutes of the advisory committee meetings at which the program was discussed and approved, with relevant areas highlighted, as well as a summary of the advisory committee recommendations.*

C. **Curriculum Standards**

• **Display of Proposed Sequence**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGEC 225</td>
<td>Agriculture Computer Applications</td>
</tr>
<tr>
<td>AGM 235</td>
<td>Irrigation and Drainage</td>
</tr>
<tr>
<td>AGM 237</td>
<td>Irrigation Wells, Pumps and Drive Systems</td>
</tr>
<tr>
<td>AGM 238</td>
<td>Irrigation System Design</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>12</strong></td>
</tr>
</tbody>
</table>

• **Transfer Applicability (if applicable)**

Not applicable
D. Adequate Resources and Compliance

- Library and Learning Resources Plan
  Discuss resources currently available for course support, as well as resources recommended for purchase to further support the course.
  
  No additional resources will be require beyond the college’s current library and learning resources.

- Facilities and Equipment Plan
  Discuss facilities and equipment currently available for course support, as well as facilities and equipment recommended for purchase to further support the course.
  
  NSF Grant and CTE Enhancement Funds have been appropriated to purchase initial technology and equipment need to start the program. The college will work with other colleges in the region as part of the CTE Enhancement Regional Project to identify future equipment and facility needs.

- Financial Support Plan
  Discuss how the program, including faculty, will be funded.
  
  Financial support for program will be address under the division’s annual college operational resources planning projections for agricultural programs.

- Faculty Qualifications and Availability
  Discuss the discipline, qualifications and availability of faculty as it relates to the proposed program.
  
  The faculty discipline for this program is Agriculture. Presently, current FT faculty and adjunct faculty are available to support program. All faculty that teach in this program will meet the State minimum qualifications and possess knowledge and experience in this program area.

- Based on model curriculum (if applicable)
  State the model curriculum on which the proposed program is based.
• Licensing or Accreditation Standards

List any licensing, accreditation or certifications available to program completers.

No required licensing or accrediting standards apply to this program; however, students who complete the Irrigation Technology AS Degree will be prepared to take multiple certification exams offered through the National Irrigation Association. No additional student selection criteria is required, this program complies with California Code of Regulations, title 5 section 55201 and 58106.

• Student Selection and Fees

If the program is selective, describe relevant entry criteria and the selection process for admission to the program. Specify all mandatory fees that students will incur for the program aside from the ordinary course enrollment fee.

There are no additional fees require beyond those identified in California Education Code section 76300.