

CTE Program Narrative

NAME OF COLLEGE: Modesto Junior College

CONTACT: Don Borges, Dean of CTE, Agriculture and Environmental Sciences

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DATE: 8/18/2016

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

FACULTY: Troy Gravatt

PROGRAM NAME: Agricultural Environmental Science (Formerly "Forestry")

REASON FOR APPROVAL REQUEST (Check One):

- New Program Proposal
- Program Revision Proposal (Substantial or TOP Code Changes)
- Locally Approved

TYPE OF DEGREE:

- Certificate of Achievement
- Associate of Arts
- Associate of Science
- Associate of Arts for Transfer
- Associate of Science for Transfer
- Other

TRANSFER APPLICABILITY: Yes No

ATTACHMENTS/INFORMATION REQUIRED:

Labor/Job Market Data and Analysis
Advisory Committee Meeting Minutes
List of Advisory Committee Members
Employer Survey, if applicable

1. 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.

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.

The goal of the Agricultural Environmental Science Degree is to increase the number, preparation and technical expertise of individuals working with environmental systems, sustainability, agriculture water management, ecosystem diversity, land use, resource efficiency, and enhance on-farm water conservation. The goals match those listed in the Education Code 66010.4, specifically section 1a, 2a and 3.

The Environmental Science impacts every industry in the Valley. Agriculture and Environment are the two largest consumers 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 water sector is heavily reliant on technology to increase efficiency and effectiveness. Over the last several decades, evolving technology has changed the way industries that operate in California conduct business, thereby impacting skill requirements of technicians. New technology has created a skills gap as it develops more quickly than the industry can keep up with. Efficiency and conservation are critical, creating a need for technicians with state-of-the-art skills. Technology that enables remote monitoring, designs and projections, and increased conservation will be embedded in the development of certificates and degrees found in the Environmental Science Program at Modesto Junior College.

2. 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*

If applicable, reference accrediting and/or licensing standards. If there is a widely recognized certification provided by a professional association, specify whether the program will fully prepare completers for the recognized professional certification.

This program will develop job skills and knowledge in environmental science as it relates to agriculture. The student will demonstrate skills in sustainable resource management in agriculture to obtain employment or to transfer to a university. Contact the division office in the Agriculture Building for advising assistance.

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

1. Employ the scientific method to solve agricultural problems.
2. Perform environmental practices necessary to be successful in the agriculture industry.
3. Apply environmental principles to sustainable resource management problems.
4. Demonstrate the effective, safe work habits and inter-personal communication skills required by employers in the Agriculture industry.

Apply the principles of ecology, soil science, viticulture, cartography, and facilities maintenance and development to sustainable resources management problems.

3. 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

Core Courses	Title	Units
	Complete 5 units	
	Environmental Career Courses - Complete 5 units	
AG 115	Introduction to Agricultural Education & Careers	1
AG 249	Agriculture Internship	2
AG 259ABCD	Agricultural Work Experience	1-4
	Complete 9 units	
PLSC 200	Introduction to Plant Science	3
NR 200	Soils	3
AGM 200	Introduction to Mechanical Technology	3
AGEC 225	Agriculture Computer Applications	3
AGEC 210	Elements of Agricultural Economics	3
AGEC 200	Agricultural Accounting and Analysis	3
	Complete 15 units	
NR 222	Native Tree and Shrub Identification	3
ENSCI 108	Environmental Conservation	3

ENSCI 110	California Water	3
AGGE 146	Agriculture, Environment and Society	3
PHILO 135	Environmental Ethics	3
	Total Core Units	29

In addition to the core courses, the student must take at least 2 units from the following courses:

Elective Courses	Title	Units
	Complete 2-3 units	
AGM 230	Field Surveying	2
AG 285	Agricultural Communications	3
AGGE 150	Sustainable Production Systems	3
EHS 201	Plant Identification & Usage 1	3
	Total Elective Courses	2-3
Total Units Required		31-32

Display of Proposed Sequence

First Semester	Units
AG 115	1
PLSC 200 or NR 200	3
ENSCI 108	3
AG 259 B or AG 249	2
Total	9

Second Semester	Units
AG 259 B	2
AGM 200 or AGECE 225	3
ENSCI 110	3
Total	8

Third Semester	Units
NR 222	3
AGECE 200 or AGECE 210	3
AGGE 146	3
Total	9

Fourth Semester	Units
PHILO 135	3
AGGE 150 or AG 285 or AGM 230 or EHS 201	2-3
Total	5-6

4. Master Planning (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.

If any expenditures for facilities, equipment or library and learning resources are planned, please explain the specific needs in this section.

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

The Modesto Junior College Agriculture Department has received several grants to assist in the development of multiple programs. Environmental topics are included in all segments of the Agriculture Industry. With the state drought, food safety issues, and environmental impacts of humans the challenges for our state are huge. Current lab and equipment available will provide for the needs of this program. There are grant funding possibilities for expansion of this program but with the current Agriculture facilities and equipment no large needs are foreseen. In addition to laboratory facilities and equipment, we have been delivering courses and teaching Environmental classes for many years. Presently there are 4 to 5 sections of Environmental Science 108 classes offered 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 2018 and continue to supply the industry with needed technicians for years to come.

The Environmental Science Degree is to prepare students for jobs in a variety of industries related to Agriculture and the environment. Training and skill development that includes; Ecosystem identification and redevelopment, equipment operation, cost estimating, and plan interpretation.

5. Need for Program

a. Enrollment and Completer Projections

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

We anticipate that the A.S. degree in Agricultural Environmental Science (Formerly “Forestry”) will achieve 15 completers per year by its 2nd year and maintain this completion rate through its fifth year of operation.

		2016-17		2017-18	
CB 01: COURSE DEPT/NO	CB 02: COURSE TITLE	SECTIONS OFFERED (ANNUAL)	ENROLLMENT TOTAL (ANNUAL)	SECTIONS OFFERED (ANNUAL)	ENROLLMENT TOTAL (ANNUAL)
AG 115	Introduction to Agricultural Education & Careers	6	130	6	130

AG 249	Agriculture Internship	2	48	2	48
AG 259ABCD	Agricultural Work Experience	2	60	2	60
AG 285	Agricultural Communication	1	20	1	20
PLSC 200	Introduction to Plant Science	10	300	10	300
NR 200	Soils	10	300	10	300
AGM 200	Introduction to Mechanical Technology	2	50	2	50
AGEC 210	Elements of Agriculture Economics	1	30	1	30
AGEC 200	Agriculture Accounting and Analysis	2	60	2	60
AGEC 225	Agriculture Computer Applications	2	50	2	50
AGGE 146	Agriculture, Environment, and Society	1	25	1	25
AGGE 150	Sustainable Production Systems	n/a		1	25
ENSCI 108	Environmental Conservation	7	210	7	210
NR 222	Native Tree and Shrub Identification	1	20	1	20
AGM 230	Field Surveying	1	20	1	20
AGM 215	Machinery Management	1	20	1	20
EHS 276	Landscape Maintenance	1	20	1	20
EHS 201	Plant Identification & Usage	1	20	1	20

b. Labor Market Information (LMI)

Summarize the Labor Market Information (LMI) and employment outlook (Including citation for the source of the data) for students exiting the program.

Enter table or chart as a separate attachment.

Please See attached

c. Employer Survey (if applicable)

When strong LMI data is not available, an employer survey may be submitted. Provide a copy of the survey, including the number of those surveyed, number of responses, and a summary of the results. The survey must address the extent to which the proposed degree or certificate will be valued by employers.

The A.S. in Environmental Science 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.

6. 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 Associate of Science in Environmental Science Degree are replacing the Associate of Science in Forestry Degree at MJC, it is independent and unique to the campus; there are no other similar programs or programs with similar curriculum.

A.S. Degree: Environmental Science

7. Similar Programs at Other Colleges in Service Area

List similar programs offered at other colleges within the Central/Mother Lode Region that may be adversely impacted. Enter ‘none’ if there are no similar programs.

College	Program
None	

Supporting documentation required

Labor Market Information

In a separate attachment, provide current Labor Market Information showing that jobs are available for program completers within the local service area. Statewide or national LMI may be included as supplementary support but evidence of need in the specific college service area or region is also necessary.

List of Members of Advisory Committee

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

Name	Title	Affiliation
Donald Borges	Dean	Modesto Junior College
Troy Gravatt	Instructor	Modesto Junior College
Lori Marchy	Counselor	TUSD & DSN, Modesto
Jenny Nicolau	Public Relations	Almond Board of California
Kelly Larson	Instructor	Hughson High School
Dr. Steve Roca	Instructor/program	CSU Fresno Agriculture
Dr. Dodson	Instructor/program	CSU Chico Agriculture

Recommendation of Advisory Committee (Meeting Minutes)

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.

SEE ATTACHED

Program Overview

Environmental Science in 7 Counties

EMSI Q1 2016 Data Set

March 2016

Modesto Junior College



435 College Avenue
Modesto, California 95350
209.575.6550

Parameters

Programs

Code	Description
03.0104	Environmental Science

Regions

Code	Description
6001	Alameda County, CA
6009	Calaveras County, CA
6047	Merced County, CA
6075	San Francisco County, CA
6077	San Joaquin County, CA
6099	Stanislaus County, CA
6109	Tuolumne County, CA

Completions Year

2013

Jobs Timeframe

2011 - 2015

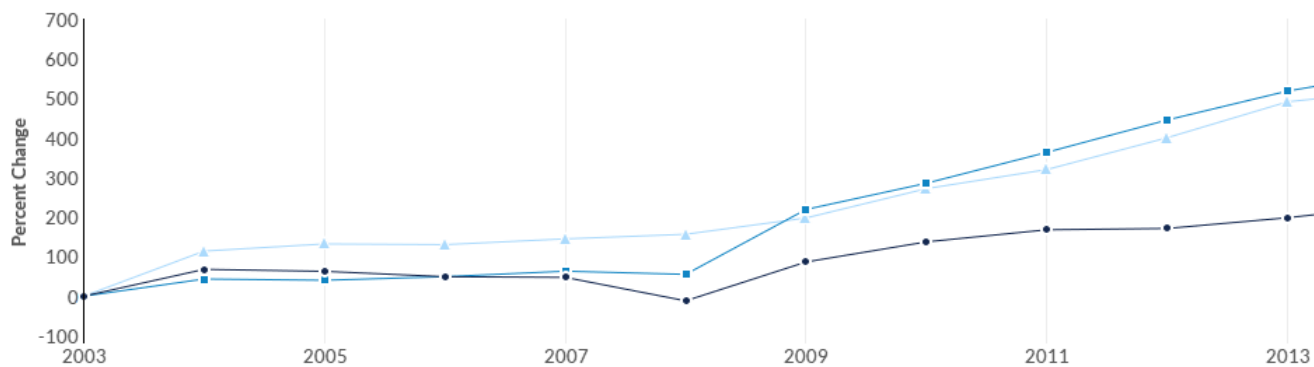
Datarun

2016.1 – QCEW Employees

Program Summary for Environmental Science

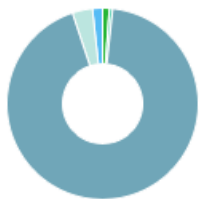
<p>10</p> <p>Regional Institutions had Completions in the last 12 years</p>	<p>176</p> <p>Regional Program Completions (2013)</p>	<p>194</p> <p>Annual Openings (2013)</p>
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Regional Trends



Region	2003 Completions	2013 Completions	% Change
● Region	59	176	198.3%
■ State	187	1,157	518.7%
▲ Nation	1,163	6,879	491.5%

Regional Completions by Award Level



Award Level	Completions (2013)	Percent
● Award of less than 1 academic year	2	1.1%
● Associates degree	1	0.6%
● Bachelors degree	164	93.2%
● Masters degree	6	3.4%
● Doctors degree	3	1.7%
Award of at least 1 but less than 2 academic years	0	0.0%
Award of at least 2 but less than 4 academic years	0	0.0%
Postbaccalaureate certificate	0	0.0%
Post-masters certificate	0	0.0%

Regional Completions by Institution

Institution	Certificates (2013)	Degrees (2013)	Total Completions (2013)
University of California-Berkeley	0	79	79
San Francisco State University	0	49	49
California State University-East Bay	0	20	20
University of San Francisco	0	13	13
University of California-Merced	0	9	9
University of the Pacific	0	3	3
Ohlone College	2	0	2
City College of San Francisco	0	1	1
Columbia College	0	0	0
Mills College	0	0	0

Similar Programs

3

Programs (2013)

349

Completions (2013)

CIP Code	Program	Completions (2013)
03.0103	Environmental Studies	336
41.9999	Science Technologies/Technicians, Other	13
30.3201	Marine Sciences	0

Target Occupations

<p>2,844 Jobs (2015) 65% above National average</p>	<p>+12.2% % Change (2011-2015) Nation: +7.0%</p>	<p>\$39.05/hr Median Hourly Earnings Nation: \$29.48/hr</p>
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Occupation	2011 Jobs	Annual Openings	Median Hourly Earnings	Growth (2011 - 2015)	Location Quotient (2011)
Environmental Scientists and Specialists, Including Health	2,039	134	\$42.86/hr	+12.31%	1.85
Environmental Science and Protection Technicians, Including Health	494	37	\$23.11/hr	+12.15%	1.23

Growth

2,534

2011 Jobs

2,844

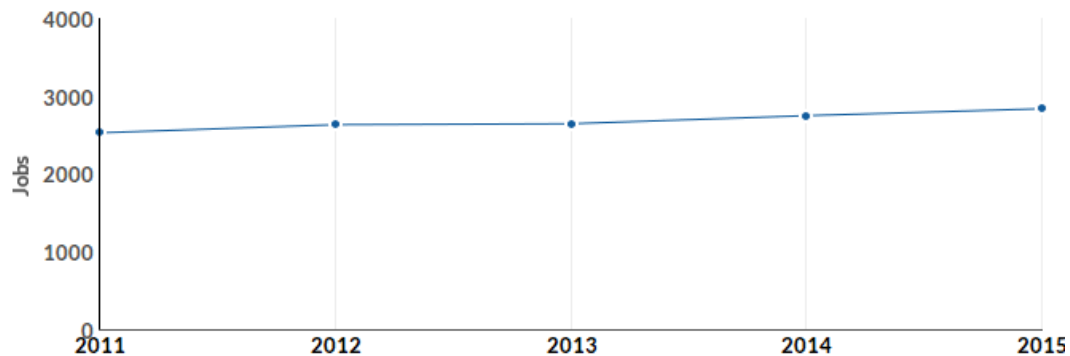
2015 Jobs

310

Change (2011-2015)

12.2%

% Change (2011-2015)



Occupation	2011 Jobs	2015 Jobs	Change	% Change
Environmental Scientists and Specialists, Including Health (19-2041)	2,039	2,290	251	12%
Environmental Science and Protection Technicians, Including Health (19-4091)	494	554	60	12%

Percentile Earnings

\$30.06/hr

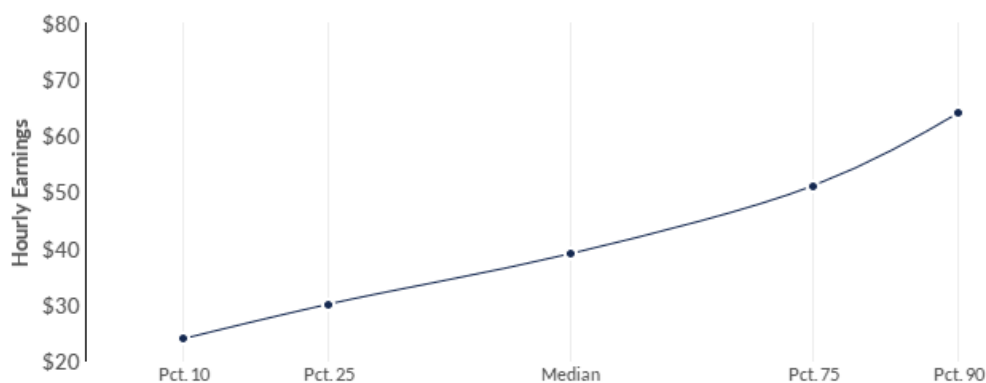
25th Percentile Earnings

\$39.05/hr

Median Earnings

\$51.11/hr

75th Percentile Earnings



Occupation	25th Percentile Earnings	Median Earnings	75th Percentile Earnings
Environmental Scientists and Specialists, Including Health (19-2041)	\$33.08	\$42.86	\$55.18
Environmental Science and Protection Technicians, Including Health (19-4091)	\$17.44	\$23.11	\$34.12

Appendix A - Data Sources and Calculations

Completers Data

The completers data in this report is taken directly from the national IPEDS database published by the U.S. Department of Education's National Center for Education Statistics.

Institution Data

The institution data in this report is taken directly from the national IPEDS database published by the U.S. Department of Education's National Center for Education Statistics.

Occupation Data

EMSI occupation employment data are based on final EMSI industry data and final EMSI staffing patterns. Wage estimates are based on Occupational Employment Statistics (QCEW and Non-QCEW Employees classes of worker) and the American Community Survey (Self-Employed and Extended Proprietors). Occupational wage estimates also affected by county-level EMSI earnings by industry.

Location Quotient

Location quotient (LQ) is a way of quantifying how concentrated a particular industry, cluster, occupation, or demographic group is in a region as compared to the nation. It can reveal what makes a particular region unique in comparison to the national average.

State Data Sources

This report uses state data from the following agencies: California Labor Market Information Department



**ADVISORY COMMITTEE
MEETING MINUTES**

'Agriculture Center for Education', MJC West Campus
November 19, 2014
6:00 P.M.

The meeting was called to order by Advisory Committee Chair John Scheuber at 6:00 p.m. on Wednesday, November 19, 2014 in the MJC ACE Pavilion.

Minutes were reviewed and approved.

Dinner was served (working meeting)

Committee meetings break off into working groups

OLD BUSINESS

- Information was provided on the fall 2015-16 enrollment and how it compared with fall 2014-15 enrollment. Discussion revolved around the fact that many course sections had to be cut because of the college budget being reduced by several million dollars over the past couple of years.
- The annual department calendar was shared with the committee with particular emphasis on the spring 2013 activities. It was made clear that the entire committee is always invited and encouraged to participate in any and all activities of the Division.
- A report of the 2014-15 CTE activities was discussed that the department would be working with the Central Region on a Regional Grant. The following project plans were shared and discussed with and supported by the committee.

NEW BUSINESS

- Community members had discussed the need for Food Safety. It was revisited that the Food Processing major had been inactivated due to lack of demand in 2012 and that there was not a fulltime instructor for the program. The Discuss concluded that there is a need for food safety related classes and that it should be revisited the idea of updating the program for future reactivation. The plans were shared and discussed, they received support by the committee to proceed.
- It was also revisited that the Forestry and Recreational Land Management majors were made inactive in 2012-13. There were no NR courses scheduled to be offered in 2012-13 other than Soils and Native Plant Identification. Discussion followed, there is a growing need to improve the area of Environmental Science, perhaps modify the NR degree program area to fit the need. The plans were shared and discussed, they received support by the committee to proceed.
- Discussion followed about the Ag Education classes and the grant with CSU Fresno. It was agreed upon by the committee to continue work with Fresno State. They provide a pipeline for transfer students and a scholarship as well to help meet the growing demand.
- Discussed Ag Ambassadors helping with Almond Board Conference in December.

Meeting adjourned at 8:30 p.m.

Committee members present:

Donald Borges –DSN, Modesto Junior College

Troy Gravatt – Instructor, Modesto Junior College

Lori Marchy – Counselor, TUSD & DSN, Modesto Junior College

Jenny Nicolau – Public Relations, Almond Board of California

Kelly Larson – Instructor, Hughson High School Agriculture Department

Dr. Steve Roca – Instructor/program coordinator, CSU Fresno Agriculture Education