MESA STATE COLLEGE

AY 2010 – 2011 Program Review

Construction Technology

WESTERN COLORADO COMMUNITY COLLEGE

Program Review

Construction Technology

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A. Program Overview

The Construction Technology Program has two areas of study:

Construction Technology-Emphasis on Supervision which is an Associate of Applied Science Degree

Construction Technology-Emphasis on Craft which is a Technical Certificate and an Associate of Applied Science Degree

The Construction Technology Program was started in the Spring Semester of the Academic year 2005. Industry leaders saw the need for continuing the training of persons in construction fields in both craft advancement and intermediate supervisory positions.

B. Program Goals and Objectives

"Mesa State College shall also maintain a community college role and mission, including vocational and technical programs. Mesa State College shall receive resident credit for two-year course offerings in its commission-approved service area."

Program Goals

The goal of the program is multifaceted:

1. The goal of the Construction Technology-Emphasis on Craft program is to provide the students with the basic training that is required for the various crafts that are associated with the construction industry.
2. The goal of the Construction Technology-Emphasis on Supervision program is to provide students with the training necessary to advance to the role of supervisor.
3. The goal of both programs is to provide the students with the training and encouragement to advance to the Construction Management Program at Mesa State College.

Program Objectives

The program objectives that stem from these goals are aligned with the role and mission of Mesa State College which allows students and faculty to:

1. Practice a commitment to student learning and development by including but not limiting the student to applying basic knowledge through advanced theory, demonstrating hands-on skills through the use of lab settings and projects for some of the courses, implementing problem solving techniques using multiple strategies.
2. Demonstrate subject matter knowledge and provide contextual learning activities
3. Manage and monitor student learning, based upon best practice including organized teaching practices and interactions with professional associations.

C. Analysis of Need for the Program

Enrollment in the Construction Technology program has shown a steady increase since the inception of the program. The Construction Management Program has increased the enrollment in certain classes taught in Construction Technology. Five Construction Technology students have transferred into the Construction Management Program.

PROGRAM ENROLLMENT					
Academic Year		2006	2007	2008	2009
Program	Degree or Certificate				
Construction Technology	Certificate		1	1	0
Construction Technology-Emphasis on Supervision	AAS	3	7	7	9
Construction Technology-Emphasis on Craft	AAS	3	5	4	1

The Construction Technology program services the CAD Program with enrollment in CONC 104.

The Construction Technology Program services the Construction Management program with enrollment in CONC 101, CONC 104, CONC 116, CONC 161, CONC 208, CONC 218, CONC 228, CONC 251, and CONC 265. These classes are either required or prerequisites for the Construction Management Degree.

Construction Technology Enrollment by Class-Academic Year 2006			
Course	**Course Credit Hours**	**Enrollment**	**Sections**
CONC 100-Introduction to the Trades	1	2	1

CONC 101-Construction Safety and Regulations	3	4	1
CONC 102-Electrical Safety	1	3	1
CONC 103-Rigging Safety Basics	1	3	1
CONC 104-Architectural/Civil Print Reading	2		
CONC 116-Building Materials	3		
CONC 117-Building Materials Testing	3		
CONC 120-General Construction Framing	2		
CONC 121-Floor Framing	2		
CONC 122-Wall and Ceiling Framing	2		
CONC 125-Roof Framing Materials and Methods	2		
CONC 130-Windows and Exterior Doors	2		
CONC 140—Stair Construction/Layout	2		
CONC 161-Building Mechanical/Electrical	3		
CONC 196-Topics	3		
CONC 203-Concrete Placing and Finishing	2		
CONC 201-Building Permits, Codes, Ethics	1	4	1
CONC 208-Construction Equipment	3		
CONC 218-Surveying	3		
CONC 228-Estimating and Cost Control	3		
CONC 231-Construction Ethics	2		
CONC 234-Commercial/Industrial Prints	2		
CONC 245-Project Management	3		
CONC 251-Construction Preparation: Codes and Permits	3		
CONC 253-Cabinets and Countertops	3		
CONC 265-Planning and Scheduling for Construction Supervisors	3		
CONC 270-Practical Applications	4		
CONC 296-Topics	3		
Total Construction Technology		**16**	**5**
Total Construction Technology Sch		**24**	

Construction Technology Enrollment by Class-Academic Year 2007			
Course	**Course Credit Hours**	**Enrollment**	**Sections**
CONC 100-Introduction to the Trades	1		
CONC 101-Construction Safety and	3	9	1

Regulations			
CONC 102-Electrical Safety	1		
CONC 103-Rigging Safety Basics	1		
CONC 104-Architectural/Civil Print Reading	2		
CONC 116-Building Materials	3	7	1
CONC 117-Building Materials Testing	3	9	1
CONC 120-General Construction Framing	2	4	1
CONC 121-Floor Framing	2		
CONC 122-Wall and Ceiling Framing	2		
CONC 125-Roof Framing Materials and Methods	2	1	1
CONC 130-Windows and Exterior Doors	2		
CONC 140—Stair Construction/Layout	2	3	1
CONC 161-Building Mechanical/Electrical	3	16	1
CONC 196-Topics	3	3	1
CONC 203-Concrete Placing and Finishing	2		
CONC 201-Building Permits, Codes, Ethics	1		
CONC 208-Construction Equipment	3	14	1
CONC 218-Surveying	3	3	1
CONC 228-Estimating and Cost Control	3		
CONC 231-Construction Ethics	2		
CONC 234-Commercial/Industrial Prints	2		
CONC 245-Project Management	3	12	1
CONC 251-Construction Preparation: Codes and Permits	3		
CONC 253-Cabinets and Countertops	3	2	1
CONC 265-Planning and Scheduling for Construction Supervisors	3		
CONC 270-Practical Applications	4		
CONC 296-Topics	3	1	1
Total Construction Technology		**84**	**14**
Total Construction Technology Sch		**244**	

Construction Technology Enrollment by Class-Academic Year 2008			
Course	**Course Credit Hours**	**Enrollment**	**Sections**
CONC 100-Introduction to the Trades	1		
CONC 101-Construction Safety and Regulations	3	20	1

CONC 102-Electrical Safety	1		
CONC 103-Rigging Safety Basics	1		
CONC 104-Architectural/Civil Print Reading	2	24	1
CONC 116-Building Materials	3	10	1
CONC 117-Building Materials Testing	3	11	1
CONC 120-General Construction Framing	2		
CONC 121-Floor Framing	2		
CONC 122-Wall and Ceiling Framing	2		
CONC 125-Roof Framing Materials and Methods	2		
CONC 130-Windows and Exterior Doors	2		
CONC 140—Stair Construction/Layout	2		
CONC 161-Building Mechanical/Electrical	3	14	1
CONC 196-Topics	3		
CONC 203-Concrete Placing and Finishing	2		
CONC 201-Building Permits, Codes, Ethics	1		
CONC 208-Construction Equipment	3	11	1
CONC 218-Surveying	3	14	1
CONC 228-Estimating and Cost Control	3	10	1
CONC 231-Construction Ethics	2	9	1
CONC 234-Commercial/Industrial Prints	2		
CONC 245-Project Management	3		
CONC 251-Construction Preparation: Codes and Permits	3	12	1
CONC 253-Cabinets and Countertops	3		
CONC 265-Planning and Scheduling for Construction Supervisors	3	16	1
CONC 270-Practical Applications	4	6	1
CONC 296-Topics	3		
Total Construction Technology		**157**	**12**
Total Construction Technology Sch		**444**	

Construction Technology Enrollment by Class-Academic Year 2009			
Course	**Course Credit Hours**	**Enrollment**	**Sections**
CONC 100-Introduction to the Trades	1		
CONC 101-Construction Safety and Regulations	3	44	2
CONC 102-Electrical Safety	1		

CONC 103-Rigging Safety Basics	1		
CONC 104-Architectural/Civil Print Reading	2	19	1
CONC 116-Building Materials	3	35	1
CONC 117-Building Materials Testing	3	13	1
CONC 120-General Construction Framing	2		
CONC 121-Floor Framing	2		
CONC 122-Wall and Ceiling Framing	2		
CONC 125-Roof Framing Materials and Methods	2		
CONC 130-Windows and Exterior Doors	2		
CONC 140—Stair Construction/Layout	2		
CONC 161-Building Mechanical/Electrical	3	19	1
CONC 196-Topics	3		
CONC 203-Concrete Placing and Finishing	2		
CONC 201-Building Permits, Codes, Ethics	1		
CONC 208-Construction Equipment	3	19	1
CONC 218-Surveying	3	26	3
CONC 228-Estimating and Cost Control	3	6	1
CONC 231-Construction Ethics	2		
CONC 234-Commercial/Industrial Prints	2		
CONC 245-Project Management	3		
CONC 251-Construction Preparation: Codes and Permits	3		
CONC 253-Cabinets and Countertops	3		
CONC 265-Planning and Scheduling for Construction Supervisors	3	8	1
CONC 270-Practical Applications	4	2	1
CONC 296-Topics	3	6	2
Total Construction Technology		**197**	**15**
Total Construction Technology Sch		**574**	

Construction Technology Enrollment by Class-Academic Year 2010			
Course	**Course Credit Hours**	**Enrollment**	**Sections**
CONC 100-Introduction to the Trades	1	3	1
CONC 101-Construction Safety and Regulations	3	27	1
CONC 102-Electrical Safety	1		
CONC 103-Rigging Safety Basics	1		

CONC 104-Architectural/Civil Print Reading	2	45	2
CONC 116-Building Materials	3	25	1
CONC 117-Building Materials Testing	3	6	1
CONC 120-General Construction Framing	2		
CONC 121-Floor Framing	2	6	1
CONC 122-Wall and Ceiling Framing	2	8	1
CONC 125-Roof Framing Materials and Methods	2	6	1
CONC 130-Windows and Exterior Doors	2	5	1
CONC 140—Stair Construction/Layout	2		
CONC 161-Building Mechanical/Electrical	3	22	1
CONC 196-Topics	3		
CONC 203-Concrete Placing and Finishing	2	5	1
CONC 201-Building Permits, Codes, Ethics	1		
CONC 208-Construction Equipment	3	22	1
CONC 218-Surveying	3	12	1
CONC 228-Estimating and Cost Control	3	5	1
CONC 231-Construction Ethics	2		
CONC 234-Commercial/Industrial Prints	2	11	1
CONC 245-Project Management	3	7	1
CONC 251-Construction Preparation: Codes and Permits	3	19	1
CONC 253-Cabinets and Countertops	3		
CONC 265-Planning and Scheduling for Construction Supervisors	3	6	1
CONC 270-Practical Applications	4	4	1
CONC 296-Topics	3		
Total Construction Technology		**244**	**20**
Total Construction Technology Sch		**644**	

Construction Technology Enrollment by Class-5 Year Average			
Course	**Enrollment**	**Sections**	**Enrollment/Section**
CONC 100-Introduction to the Trades	2.5	1.0	2.5
CONC 101-Construction Safety and Regulations	20.8	1.2	17.3
CONC 102-Electrical Safety	3.0	1.0	3.0
CONC 103-Rigging Safety Basics	3.0	1.0	3.0
CONC 104-Architectural/Civil Print Reading	29.3	1.3	22.0

CONC 116-Building Materials	19.3	1.0	19.3
CONC 117-Building Materials Testing	9.8	1.0	9.8
CONC 120-General Construction Framing	4.0	1.0	4.0
CONC 121-Floor Framing	6.0	1.0	6.0
CONC 122-Wall and Ceiling Framing	8.0	1.0	8.0
CONC 125-Roof Framing Materials and Methods	3.5	1.0	3.5
CONC 130-Windows and Exterior Doors	5.0	1.0	5.0
CONC 140—Stair Construction/Layout	3.0	1.0	3.0
CONC 161-Building Mechanical/Electrical	17.8	1.0	17.8
CONC 196-Topics	3.0	1.0	3.0
CONC 203-Concrete Placing and Finishing	5.0	1.0	5.0
CONC 201-Building Permits, Codes, Ethics	4.0	1.0	4.0
CONC 208-Construction Equipment	16.5	1.0	16.5
CONC 218-Surveying	13.8	1.5	9.2
CONC 228-Estimating and Cost Control	7.0	1.0	7.0
CONC 231-Construction Ethics	9.0	1.0	9.0
CONC 234-Commercial/Industrial Prints	11.0	1.0	11.0
CONC 245-Project Management	9.5	1.0	6.3
CONC 251-Construction Preparation: Codes and Permits	15.5	1.0	15.5
CONC 253-Cabinets and Countertops	2.0	1.0	2.0
CONC 265-Planning and Scheduling for Construction Supervisors	10.0	1.0	10.0
CONC 270-Practical Applications	4.0	1.0	4.0
CONC 296-Topics	3.5	1.5	2.3
Total Construction Technology	**139.6**	**13.2**	**10.6**
Total Construction Technology Sch	**476.5**		

Construction Technology Credit Hour Data-Spring 2006 thru Spring 2010									
	Spring 06	Fall 06	Spring 07	Fall 07	Spring 08	Fall 08	Spring 09	Fall 09	Spring 10
Student Credit Hours	24	69	175	276	168	331	243	339	305
Credit Hours	7	15	24	21	14	24	21	24	27

Taught									
Ratio	3.43	4.60	7.29	13.14	12.00	13.79	11.57	14.13	11.30
FTES	.80	2.30	5.83	9.20	5.60	11.03	8.10	11.30	10.17
FTEF	.29	.63	1.00	.88	.58	1.00	.88	1.00	1.13
FTES:FTEF	2.74	3.68	5.83	10.51	9.60	11.03	9.26	11.30	9.04

Degrees Awarded by Major Code, Fiscal Years 2004 – 2010, Mesa State College									
Level	Major Code	Program Name	2004	2005	2006	2007	2008	2009	2010
Associates	1372	Construction Technology Supervision						2	2
Total								**2**	**2**

D. Narrative Summaries of Resources

i) Unique Characteristics of the Program

The focus of this program is on the training of students to meet the needs of area businesses that are in need of entry level supervisory personnel, the training of students to meet the needs of area businesses that are in need of craftsmen with training in the latest innovations in the construction industry, and the training of students to enter the Construction Management Program at Mesa State College.

Construction Technology includes multiple emphases that present a unique set of challenges and opportunities for the students to study the requirements for general contracting or specialize in one of the trades that are associated with construction (i.e. electrician. Plumber, carpenter, etc.). As the technology in the construction industry advances our program needs to keep abreast of the changes to insure that our students are kept up-to-date with the latest industry trends and requirements. This is accomplished by working collectively with the business advisory committee on a regular basis.

ii) Faculty

The faculty in the Construction Technology Program includes one full-time technical instructor and one or two adjunct instructors depending on the classes offered per semester.

Richard Leonard, technical instructor, has 20 years of experience in the construction industry as an electrician in Colorado and Nevada. Richard is currently working on his Associates Degree in Construction Technology.

Glen Hoff, adjunct instructor for the Construction Technology –Emphasis on Craft program, has more than 20 years experience in the construction field as a carpenter, and has been a licensed general contractor in California, and instructor.

Patti Hoff, adjunct instructor for Construction Technology-Emphasis on Supervision, has more than 25 years experience in the construction field as a facilities inspector, general contractor and instructor.

iii) Physical Facilities

The physical facilities for the programs are quite adequate at this time for the number of students enrolled in the programs. The classes for the Construction Technology-Emphasis on Supervision classes have been moved to the Archuleta Engineering Center to provide the classroom seating needed due to the number of students that are enrolled.

iv) Instructional Equipment

It is not possible to have every piece of equipment that could be utilized in the construction workplace. The equipment that is available for the students to utilize in the Construction Technology program provides the students with the basic skills that need to be developed. The advisory committee has been generous with funds to provide the students with an excellent lab setting for the Construction Technology-Emphasis on Craft program and has provided the programs with an excellent classroom for the studies of the theories applied in the construction program.

v) The library support is excellent in providing reference materials to support the core competencies of the programs. The ever changing nature of technical advances and construction guidelines requires ongoing additions to the references available in the library.

vi) The Construction Technology-Emphasis on Craft Program requires the highest percentage of the annual budget for the Construction Technology Program. This program is very active in attempting to offset the expenditures of the program by coordinating with facilities at WCCC to provide the campus with construction projects that can be utilized by the campus while teaching the students the basics of construction.

E. Effectiveness

i) The Construction Technology Program at WCCC is accredited to provide the students enrolled in the Construction Technology programs and the Construction Management program with an OSHA 10 Hour Safety Certificate and Card for Construction Safety. The Construction Technology program is also a member of the International Code Council for the construction of Residential Dwellings.

ii) The students that have graduated from the Construction Technology Program are currently employed in the construction field or have started their own businesses in the construction field. Other students that were initially enrolled in the program have changed their major from Construction Technology to Construction Management and have successfully made the transition to the 4 year program.

F. Strengths Identified by the Review

i) The strengths identified by the internal review include the strong support from our business advisory council.

ii) The program is enhanced by the quality and commitment of the faculty in the areas of scholarship, advising, service and professional development. The student evaluations attest to the quality of education that the students are receiving.

iii) The equipment available for the students is excellent and the instructors endeavor to maintain a "real world" atmosphere for the students to apply the use of the equipment and facilities available.

iv) The Construction Technology-Emphasis on Craft program is showing an increased enrollment and interest.

v) Close involvement with the Construction Management program have increased the opportunities for the students in the areas of possible internships and lab developments.

G. Areas Needing Strengthening Identified by the Review

i) The major area that needs strengthening is the recruitment of new students into the Construction Technology-Emphasis on Supervision program. The advent of the Construction Management program has provided us with an additional pool of perspective students, these students could be utilizing the program as a minor degree.

H. Vision

The program will be reviewed annually to determine the changes that must be made to the curriculum to reflect the changes that are occurring in the construction field. Further coordination with the Construction Management program will provide the students with greater opportunities after transfer or graduation. Ongoing development of "real world" lab settings will provide the program with higher development of the students' skills.

Mesa State College
Western Colorado Community College
Construction Technology / Supervisory
Construction Technology / Craft
A.A.S. Degrees
Program Review

External Evaluator's Review
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INTRODUCTION

On November 16, 2010, I visited Mesa State College and WCCC for an onsite evaluation of the A.A.S. programs in Construction Technology in Supervisory and Craft. The one day visit provided an opportunity to tour the facilities of the main campus and the WCCC campus, meet with Administration, meet with Department Chairs and faculty, interview students, meet with support staff in a variety of areas, and have a lively discussion with faculty from the Construction Management B.A.S. degree. The agenda set forth was organized and appointments were conducted in a timely manner. All appointments and meetings set forth by the institution were carried out with little or no variances or interruptions. I was overwhelmed by the courtesy and generosity of information that was provided in the one day evaluation. It was very evident that there is a great amount of pride that accompanies all involved with both institutions. Mesa State College and WCCC are unique because of the educational opportunities that the institutions provide. This in itself indicates the bountiful opportunities that the institution has, is, and can continue to take advantage of in developing the workforce to meet Industry needs.

The Administration provided all necessary information required to complete a thorough review of the programs and the associated departments. The faculty and administration interviews were instrumental in not only capturing a glimpse of the history of their respective areas, but also in providing information on the background of the institution as well. The faculty's dedication to the college is an indication of the strong working relationship among all parties involved at Mesa State College and WCCC.

The academic and technical rigor is adequate, based upon the curriculum, space allocation and resources available. Faculty credentials do not reflect the knowledge that is held by those that teach in the A.A.S. degree program. Later in the report, I will define some weaknesses that may affect the program because of a credential based salary structure. Resources provided to students such as library services, tutoring services, financial aid services, career services, and student activities allow students to participate in a full and positive college experience, even though these are housed at a remote location to the WCCC site. The facilities look attractive and are well maintained. This also produces a very positive image for the institution.

I must comment on the politeness and professionalism that resides within students, faculty and staff alike. More than academic and technical excellence is evident at your institution. A professional and ethical attitude seems to be the norm of the students to which I had an opportunity to meet and greet during the review.

STRENGTHS OF THE PROGRAM

The A.A.S. degree in Construction Technology / Supervisory, and Construction Technology / Craft, although neophytes in the Mesa State College system, have the opportunity to be agents of growth. In defining the term neophytes, it is stated with the understanding that both programs have been established less than seven years. All indicators show that the construction industry is on the rise from the recent economic downfall. The industry is beginning a rebound, and what better time than now to establish sound educational goals and to meet the future needs. Potential for growth is at the doorstep. The presence of secondary education in the construction field being encouraged by the Perkins Act, and the established "program of study" requirements provides a great segway for increased enrollment.

The attributes that the programs possess that indicate growth potential:

1. Dedicated and experienced faculty

The faculty experience is what seems to support the advancement toward the goals of the program in its present form. Credentialing, if viewed as necessity, can add to credibility. Wisdom, knowledge, experience, and pride in ones endeavor, whether it is the teaching aspect or the vocational aspect are rarely found in combination in such a group of individuals. When speaking with the students, their statements reflected respect and admiration for the full time and adjunct faculty within the program. Having a faculty that is as experienced and knowledgeable is definitely strength. However, it can also produce a threat in future years when replacement after retirement becomes an issue. Finding well qualified faculty can sometimes become difficult and painstaking, especially if teaching experience and degreed credentials are desired requirements. As the program grows and becomes established, I would expect that both qualities would be used as benchmarks for hiring practices.

2. Supportive Administration

It was very apparent that the Administration has supported the two programs and will continue to show support in all aspects of the collegial atmosphere. It was apparent that WCCC, having a vested interest both administratively and facilities wise, provide the immediate support. Providing graduating students with a diploma from Mesa State College adds a flavor of prestige to their accomplishments. This in itself provides a very good recruiting tool.

There is an extensive amount of work needed to prepare for and execute a successful program review. Much of this work falls upon the responsibility of the Administration. The organization and data collection provided accessibility to critical information. These efforts again illustrate the support provided by the Administration from both institutions in order to provide a comprehensive and thorough review of the programs.

Students were pleased with the opportunity to experience the Mesa State collegial experience with all that a large institution has to offer and maintain the closeness experienced by the WCCC technical offerings. This again provides a positive learning experience that is a selling point for the programs.

3. Course rigor

Review of course descriptions, course logistics and expected student outcomes provided indicates the programs are in sync with other institutions having similar programs on the national level. Lab facilities are in need of attention. This will be reviewed further in the document. The "supervisory" emphasis definitely provides a much stronger rigor, due in part to the newness of the "craft" emphasis and its rather sparse enrollment to begin with. The theory hour to lab hour ratio is higher than most technical programs. However, the study of concepts in a lecture setting is many times more advantageous. In reviewing the self study, student outcomes that require skill performances are comprised of analytical thinking and problem solving techniques. With the understanding that students from the Construction Management B.A.S. program share a number of similar courses in the first two years, expectations of maintaining standards within the A.A.S. Construction Technology programs is evident.

With the small number of faculty providing the skill set coursework, it is evident that collaboration can occur rather easily and maintain logical flow from one emphasis to the other and with the B.A.S. program.

WEAKNESSES OF THE PROGRAM

Identification of weaknesses may not be the most positive way of evaluating a program. I would prefer to provide opportunities that may enhance what is already present. For every good, strong quality identified, one can always find a quality that may need to be strengthened.

I will identify six elements of the Construction Technology programs and the associated areas that I feel prohibit the programs from reaching full potential:

1. Facilities;

The physical space allocated for the Construction Technology programs may seem appropriate for the enrollment at present, but growth will be hampered by what presently exists. The space (including the Archuletta Engineering Center) limits the capability of proper construction education. In order to meet the required outcomes, the faculty has developed creative ways to measure student preparedness. However, as enrollment increases these methods may not be suitable for proper assessment. The lab activities are relatively

small in size and in duration due to the lack of instructional lab space. In honesty, it would be very difficult to distinguish between vocational programming on the secondary level and the post secondary level based on lab use and project rigor. The classroom in the Construction Technology area is small and meets the basic needs for theoretical teaching. The lack of a technology suited room does limit opportunities for enhanced methodology and applying different teaching techniques at the WCCC campus. To adequately provide lab activities that portray true to life experiences with a positive learning environment, modifications would need to be made to enlarge the lab area and remove equipment that is not appropriate for construction practices such as framing, roof construction, interior finish, trim, concrete, masonry and other associated skill sets.
Professor Leonard's use of exterior space for practices such as surveying, scheduling and cost analysis for excavation is appropriate, however little was mentioned regarding practices during times of inclement weather, or program growth.

The opportunities afforded at the Mesa State College campus are very appropriate. Through student and faculty interviews, the travel required for academic course work and student services has no adverse impact on academic or extracurricular activities. The Mesa State Campus provides more than adequate services and amenities for a vigorous college experience.

2. Integration and Articulation of Programs;
After reviewing the programs of study, the transferability into other degrees seemed very confusing and lacked clear, concise direction. Within the college catalogue for WCCC, it was noticed that information regarding the ability to articulate into the Business Administration B.A.S. degree at Mesa State was a documented opportunity. However, there was no mention regarding the articulation highlighted for the Construction Management B.A.S. (at least no direct link that was as apparent as the Business Management). There needs to be more defined pathways that will allow transfer from the A.A.S. degrees in Construction Technology into B.A.S. degrees. A simple flow chart that would allow for better understanding could bolster enrollment in not only the A.A.S. degree but also the B.A.S. degrees as well.

3. Non-Traditional / Diversity Enrollment;
A non-traditional work force is on the horizon. The number of women within technical skill areas have increased over the last decade all across the nation. Numbers achieved from the general institutional characteristics, the Strategic Planning Goals Progress Report, and the Construction Technology self study show that there are opportunities to grow in this area. The advancement of non gender based programming and non-traditional education needs to be a vital piece of an institution's portfolio, specifically in the technology fields. There seemed to be no indication that "Women in Construction" was not a viable option nor was it considered a priority.

A review of the data from 2005 through 2009 indicates a fairly balanced gender population at Mesa State College. However this was not evident within the Construction Technology program area.
There was no data available or information provided that indicated a diverse population existed within the Construction Technology program. Data indicated that Mesa State College exhibited a predominately white, non-Hispanic population. A presumption would be that the Construction Technology program would not vary in race/ethnic comparison from that reported for the entire institution.

4. Assessment;
Assessment is critical in any educational setting. Assessment provides a means for full circle measurement, adjustment and trial of student, program and institutional effectiveness. There was very little proof or use of an effective assessment plan or procedure for the Construction Technology program. There was some evidence of testing methods but there did not seem to be a distinct plan that provided continual feedback for improvement of the program. With the advancement opportunity that students have to enter B.A.S. degrees, an assessment tool would be critical for determining readiness for higher level coursework. It would be appropriate to establish a portfolio especially in the evaluation and assessment of craft skill sets.
Some plan of outcomes assessment with an equitable measuring device would aid in determining such things as equipment needs, curriculum revision, staff development or facility upgrades.

5. Advisory Board / Industry Involvement;
Mr. Leonard spoke briefly of advisory board input. There was also an indication that industry involvement helped to establish the facility for the Construction Technology lab and classroom through community efforts. This action, in its self, illustrates a commitment that can provide strong ties to industry and the community. In the program self study, Part F, 1) states the support from the business advisory council as a strength of the program. This seems to be lost in all documentation viewed over the course of the pre-visit preparation and the visit. Transparency needs to be incorporated that will support advisory committee involvement. Documentation of meeting minutes, advisory board membership lists, advisory focus group gatherings, board member classroom visitations, and action items presented by the advisory board can provide all stakeholders with a clearer picture of the interaction between the institution and committed partners. I was unable to determine the overall impact that the advisory board had on developing and establishing curriculum within the A.A.S. programs.

ATTAINMENT OF GOALS AND OBJECTIVES

After reviewing the mission of MSC, it is evident that there is a strong binding theme that flows from MSC to WCCC. The institution is dedicated to providing a strong educational experience that meets the workforce needs for the western portion of the state. The Mesa State College strategic plan progress report for goal #6, defines the general purpose of WCCC. The key components illustrated in the goal are to meet the needs of the community with graduates that have developed a sound technical background and provide a home for developmental education. The goals provided in the program self study are somewhat limited and rather simplistic. The term training is used in lieu of the term education within the program goal statement. Training indicates a repetitive action that does not require critical thinking, or problem solving techniques to accomplish a task. The term education indicates there is knowledge provided to incorporate skills that encourage cognitive thinking, the ability to think through a task, develop a plan of action and determine solutions that would rectify problems encountered during the process. The attainment of program goals 1&2 is rather nebulous. It is very difficult to determine the completion of these goals. Goals should be reviewed on a periodic basis and retired upon successful completion, or when the goal is no longer valid. These particular goals would be ones with unlimited application.

The third goal statement for the program is achievable in theory but does not provide a benchmark for attainment in reality. The goal simply states to supply training and encouragement. By what methods can this be accomplished, what would be considered proper and note worthy encouragement?

Nobel goals as they are, they are vague and consist of rudimentary action in order to work toward an unknown mark of completion.

Through the sequential nature of the program course work it is demonstrated that the goals of the programs (with respect to their simplicity) and the institution are being met. The syllabi for each course reflect a progressive learning pattern with integration of communication skills and mathematical concepts that indeed spur on critical thinking and problem solving techniques and skills. Again, this is a direct link to the student outcomes listed by the program and in concert with those indoctrinated in the mission of the institution.

The program objectives do indeed align with the mission and the strategic plan of Mesa State College. The objectives do incorporate descriptors that consist of measurable outcomes. Although the first program objective can be confusing in its wording, it provides a sound philosophy of the program's intent and expectations.

A program's success can also be measured by positive placement of its graduates. Very little information was presented in any form regarding graduate placement. The opportunity to speak to a graduate that experienced success from his education in the Construction Technology /Supervision program proved to be insightful. His accolades brought nothing but satisfaction and honor to the program, the facilities and the faculty. As highly as this graduate spoke of his experience, it is evident that the curriculum, faculty, administration, and institutions combined to

meet the needs and expectations of higher education. The testimony of an enrolled student also indicated a satisfying experience while earning his A.A.S. degree in Construction Technology supervision. At present the enrolled student is in the process of completing his B.A.S. in Business Management. It would have been advantageous to interview industry and advisory board representatives to validate the level of preparedness that graduates from the Construction Technology program exhibit. However, this opportunity did not present itself. Graduate employment data from the programs, even during its infancy, can determine reasons for change, be it curriculum or learning activities. This data could serve as a measure for assessment of student outcomes. Such data, coupled with other relevant outcomes assessment tools and industry survey responses would also allow the programs to develop a strategic, comprehensive plan for curriculum revision, instructional equipment procurement, staff development opportunities, facility needs, and budgeting.

APPROPRIATENESS OF PROGRAMS

Curriculum:
The curriculum is solid in its present form. The sequence is very appropriate based on course numbering and individual program requirements. There did not appear to be voids in the logical sequencing of skill sets or theoretical concepts. Course numbering follows a logical pattern in relationship to the rigor of the course and the level of pre-requisite knowledge. After evaluating each course for the two Construction Technology programs it is confirmed that student outcomes match the description and rationale of each course. Updating specific course outcomes via industry input would promote the delivery of up to date content.

Expertise of the faculty:
As stated earlier, faculty expertise matches the level of the program needs. The guidelines for faculty hiring considerations are consistent with most institutions of higher education. There does seem to be inequity for securing institutional rank between faculty at MSC and WCCC. After speaking with the president of the faculty senate it was apparent that promotion in rank is much more difficult for faculty relying on their experience in technical fields than those that achieve graduate degrees, terminal degrees and traditional educational credentials. The only relationship that this concern has with this external evaluation is the ability to attract experienced faculty for future needs. Difficulty may exist when trying to find acceptable credentials coupled with appropriate experience and knowledge when seeking a candidate for any of the technologies being taught at WCCC.

It is very evident that faculty are dedicated to providing the best possible learning experience. Their continuation in program specific activities outside the institution whether it be Industry

affiliation, organizations or the continued practice of their vocation solidified the fact that dedication, pride, and lifelong learning is prevalent among them all, adjuncts included.

Sufficiency of resources:
I found the resources to be somewhat appropriate for the programs. The number of publications and audio /visual aids available at the Mesa State College campus library is sufficient and contains relevant content. The course content did not specify particular assignments or projects that required research practices using the library's extensive collection, but evidence from mentioned projects did provide proof of use. The academic coursework required by all students within the A.A.S. programs also substantiated the use and mastery of research activities. The course requirements for academic rigor emphasize the use of sources other than experiential situations for the development of writing and oral presentations.

Use of Technology:
The availability of technologies at WCCC is somewhat limited. The lecture hall is not equipped with smart technology. Today's society relies on expeditious communication. Not only can up to date technological equipment provide extraordinary and innovative ways to present material and concepts, but it also provides education and use of application skills within one's chosen field of study. Without knowledge of proper and ethical use of technology, students within the Construction Technology career path would be at a disadvantage. The limited computer stations in the Construction Management program at the Archuletta Engineering Center that are shared by both B.A.S. and A.A.S. programs limits accessibility and activity for all involved. Having the opportunity to learn and utilize such tools allows the students to progress at a much faster pace. The institution has made a commitment to the students by providing such tools. As time progresses the curriculum should reflect more use of technologies to keep up with the fast pace of innovation.

Adequacy of college support services:
As stated earlier in the report, I find the MSC and WCCC support services to be more than adequate. Student interviews indicated that they felt comfortable and well attended. This is a credit to both administrations. Many times students feel a separation from one institution or the other. If there is a lack of identity with either institution, it was not evident from the student's perception
Communication between the support staff and the faculty appeared to be very good. The services provided for academic support were excellent. The retention strategies were well designed to produce strong retention figures, specifically for developmental students.

Rapport with employers in industry and business:
It is evident that there is a standing relationship between the programs and their respective industry partners. The support of industry to WCCC programs appear to be strong. This is

demonstrated in part by the equipment that was secured for the initial start-up of the Construction Technology / Craft program

RECOMMENDATIONS AND OPPORTUNITIES

In every program spanning post-secondary education, there are always opportunities that will improve our educational endeavors. The following is a list of opportunities that may allow the Construction Technology/ Supervisory and Construction Technology / Craft programs to expand and provide a very unique and value added service to the industries for which they are a part, those being education and the technical fields:

1. Opportunity to Expand Enrollment

The Construction Technology program has an outstanding opportunity to market a pathway for students beginning at the high school level. The change in federal Perkins Act procedures and funding has made way for 'Programs of Study" requirements. These requirements provide prime opportunities for post-secondary technical education to link with secondary programming creating a smoother transition to continued education. WCCC has a great opportunity for marketing this link and securing funding along with enrollment. The matriculation into Construction Management from the Construction Technology degrees would then clear the path from high school through a four year degree. The ability to establish a secondary enrollment that commits to post- secondary programming with the possibility of credit carryover is a benefit to all stakeholders. The added advantage to participating in the "Program of Study" is the eligibility for funding for both the secondary and post-secondary programs. The participation is more complex than suggested, but such opportunities can definitely increase enrollment and secure needed funding. .

2. **Facilities Expansion**

The lab facility that is dedicated to the Construction Technology Programs, specifically the Craft emphasis is in need of expansion if enrollment is to increase. A need to provide adequate space for skill demonstration will only help the program. Teaching real world experiences can be difficult when the main concern is space constraints and material usage. It was indicated in the self study that the Craft program expends most of the available instructional supply budget. This is understandable for the nature of the skill sets learned and the expected outcomes of the program. To stifle the ability to practice the skills with limited instructional space and resources is death to any technology program. There are great models being practiced that avail small programs to perform all the learning activities that large programs utilize. Construction of a home that can then be auctioned or sold to generate funding for the next structure is one way. Habitat for Humanity is a great venue for utilizing others working capital for materials. Many nonprofit organizations can benefit from student learning activities. Caution should be used

when these are the only methods that are available and practiced. Material delays, inclement weather conditions and time of completion restraints can influence or even collapse a productive learning experience. Involvement of the advisory board can also produce favorable solutions and many times instructional supplies.

3. **Outcomes Assessment**

Develop more meaningful and obtainable goals for the programs. Use benchmarks and work toward those benchmarks. Although the program is relatively young, the need to document progress is very important in developing a strategic plan for the program.

Incorporate an Industry Standards test to be given to students prior to graduation. The use of the OSHA 10 hour certification is appropriate, but look for further industry driven accreditation that lends credibility to the program.

Investigate methods for developing an outcomes assessment plan that may provide a method to assess progression or digression, and gives a measurable means of proving that you do what you say you are doing.

Closing Remarks

I was very impressed with all that I viewed, heard, discussed, and toured. MSC and WCCC should be very proud of what they have to offer. I believe that students are fortunate to have the opportunity to learn and experience the skills necessary to become the technicians of tomorrow. The faculty is very knowledgeable and student oriented. They have a passion that is evident to the students. Although small in number, they speak loud for the industry, and it truly shows with the respect that was evident from the students and the administration. I am happy and pleased to have had the opportunity to participate in the
program review as an external evaluator.

I am thankful for the kindness, generosity, and hospitality that were provided to me. Mesa State College and Western Colorado Community College has much to be proud of, such as the Administration, the students, the faculty, and the programs that are offered. The program review process is a very important one, and I feel that Mesa State College has done a great job in assuring that it is done in an organized and professional manner. I am at your service to discuss any or all of this review document. Thank you for the opportunity.