MESA STATE COLLEGE

AY 2006 – 2007
Program Review

Technology Integration

A. Program Overview

The Technology Integration Program includes three distinct technical areas:
- Certified Electronics Technician
- Network Technician
- Telecommunications Engineering

The program offers Technical Certificates in three areas of concentration:
- Technology Integration - Certified Electronics Technician
- Technology Integration - A+/N+ CCNA
- Technology Integration - VoIP Technician
- Technology Integration – Process Maintenance Technician

The program offers Associate of Applied Science degree in three areas of concentration:
- Technology Integration – Certified Electronics Technician
- Technology Integration – Network Technician
- Technology Integration – Telecommunications Engineering

In addition the degree of Associate of Science with an Electronic Engineering Emphasis is available.

The Technology Integration program, or some of the technical areas in the program, has been offered at Mesa State College for more than 30 years. The current structure of the program was established in the 1990s in response to changes in the technology businesses in the region. The local networking companies advised that there were few jobs for graduates with narrowly focused training in one of the three areas that are now under this program. The suggestion was that we begin offering a program that provided some classes in all three areas to any student that was pursuing a degree in technology related studies. The eventual outcome of that advice was the current structure in which all students in the program will take core course in each of the technical concentrations that that then leads to the emphasis the students are pursuing. Then all students come back together for a capstone course. This provides graduating students with a better understanding of the systems of technology activities that they will encounter upon entering the workforce in our community.

The curriculum in each technical area is updated periodically to reflect changes in area businesses. The most recent major change occurred in the Networking and Telecommunications emphases where we have combined them into one because of the standardization of the Voice over Internet Protocol. This reflects the national and international trends in the industry. By utilizing the industrial electronics expertise of the faculty we will facilitate the introduction of a Process Systems Technology degree.

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 overall program goals for the Technology Integration program at WCCC are:

- Provide the students with the skills and knowledge to be productive citizens and excel in their chosen fields.
- Work with business and industry stakeholders to continually enhance the quality and timeliness of technical content.
-

Program Objectives
The program objectives for the Technology Integration program at WCCC are aligned with the role and mission of Mesa State College which allows students and faculty to:

- Demonstrate an understanding and appreciation of the liberal arts including the humanities, social sciences, mathematical and natural sciences,
- Practice a commitment to student learning and achievement, including, but not limited to applying basic through advanced technology theory, demonstrating hands-on skills, problem solving techniques, using multiple strategies,
- Demonstrate subject matter knowledge and pedagogy, including, but not limited to creating effective learning environments, practicing teaching both as a science, providing contextual learning activities,
- Manage and monitor student learning, based upon best practice including, but not limited to using a variety of teaching methodologies, involving support personnel, parents and community members to maximize student success, following ethical responsibilities of teaching,
- Organize teaching practices and learn from experiences including, but not limited to, using current research to improve practice, accept teaching as a lifelong learning process, interact with various education personnel and professional associations,
- Participate in learning communities, including, but not limited to, using the community to enhance programs, interact with parents and business and industry to maximize learning, participate in local, state and national professional associations,
- Use technology and concepts to enhance learning and personal/professional productivity including, but not limited to, implementing curriculum that includes technology-enhanced methods and strategies, applying technology to a variety of assessment and evaluation strategies; and,
- Mesa State values teaching, learning, and student-faculty interaction. We provide our students with expanded opportunities to participate in research and active hands-on learning as a supplement to the classroom. Mesa State is dedicated to assisting students in achieving their goals and dreams.

C. **Analysis of Need for the Program**

i. Enrollment rates have been steady until recent years have shown a decline, which also reflects the state-wide enrollments in similar programs, although, with added support, we know the pool of potential students is larger than our enrollments.

*	Fall **2001	Fall **2002	Spring 2003	Fall 2003	Spring 2004	Fall 2004	Spring 2005	Fall 2005	Spring 2006
Enrollments	52	47	42	33	35	32	32	26	27
Graduation	16	11	10		6		12		10

*Appendix i, **Not divided between Fall and Spring

Our graduation and placement rates are very good in relationship to the type of student that enters or program (Appendix A, Tables 1, 2, and 3). We have very few full-time traditional students. Most of the cohorts are working students only taking a few classes per semester, thus it takes them more than two years to graduate and we will have groups of graduates and then only a few per Spring semester. Course totals are found in Table 4 of Appendix A.

ii. As the Grand Valley grows and the oil and gas industry ramps-up, we see a growing demand for electronic, networking/telecommunications, and process systems control technicians. We have already placed many of our graduates in the oil and gas fields as E-Techs, within numerous businesses (including Mesa State College) as network/telecommunications technicians, and maintain a strong advisory council which helps guides our curricular decisions.

At the conclusion of the last Program Prioritization Review conducted by Academic Affairs and the office of the President, Technology Integration (formerly Communications Technology/Telecommunications) ranked the second highest of all AAS degrees by the diverse committee. One of the key elements was program efficiency. When it was made clear that ½ of a Faculty FTE, from our department, supports other programs such as Electric Lineman, CISB, UTEC and Mathematics coursework at the Bishop campus our efficiency is very effective.

Through the guidance of our Business Advisory Committee, we have identified a critical need for Process Systems Technology technicians. This is not only in support of the oil and gas industry, but advance manufacturing businesses needs are now beginning to

emerge. The core of that coursework is industrial electromechanically controlled systems and networking problem solving skills. The addition of this degree will enhance both the enrollments of the program and the critical need for advanced technical training equipment.

Our program is successful for the students because we teach contextually in a technologically rich environment with extensive hands-on content-rich course work. Our graduates have work with Faculty that has rich industry experience and the students have work in real-world environments created by that faculty. As stated by Craig Barrett, Chairman Intel Corporation, "My hope as a business leader is that these reforms will get us to the 21st-century school – a 21st-centrury learning environment that offers a content-rich curriculum. "inquiry-based learning" has value, but process should not replace content" (Appendix vii).

These concepts have been reinforced when members of our department and school were awarded a National Science Foundation Grant (NSF) titled; Integrated Learning Systems: A model approach in which we proposed the development of a content-rich model integrating multiple disciplines in a project-based learning environment. Working with local businesses as partners on the grant, the team will explore this innovative learning model to help create the 21st-century school environment. This acknowledgement by the NSF attests to the fact that we are on the right track.

With the role and mission at Mesa State College/WCCC being a teaching college, our program strives to innovate, research, and excel in that mission. We are teachers first and foremost and the positive results show in the success of our graduates exemplifies our efforts.

D. **Narrative Summaries of Resources**

i) Unique characteristics of the program influencing the need for resources.

Technology Integration includes multiple disciplines that present a unique set of challenges and synergy. The challenge is to prioritize the resources to meet industry demands for technically competent workers in developing markets; while maintaining the academically rigorous basic skills required of multiple diverse employers.

The most recent example is the two-phase Gas and Oil demand. Currently the exploration of gas and oil is driving demand for

electronics technicians. Primarily these jobs are electro-mechanical but with some electronics and networking experience desirable. Closely on the heels of the exploration will follow production of the Oil and Gas industry. While the fundamental troubleshooting and technical skills will still be required additional specialized training in Process Control is anticipated.

Maintaining the strong electronic fundamentals has provided our small program the agility to meet the industry trends which are demonstrably cyclical.

ii) Faculty and Staff

The program currently functions with four FTE faculty (Table 5.). The afore-mentioned mult-idisciplined market place requires multi-disciplined faculty with strong teaching and technical skills. Professional development has to be vigorously pursued to satisfy the rapid advances required of our graduates. We need additional training in process Control's an example being Programmable Logic Controller's, (PLC's). Appendix B presents vitae for the TECI faculty.

iii) Physical Facilities

The physical plant was intended to be a temporary solution to the schools growth need and was not intended to last longer than two years. The facility present's a harsh environment for maintenance and calibration of computers and electronic equipment. It is not adequately enclosed and subjects laboratory equipment to excessive dirt, dust, humidity and temperature extremes. (Not to mention the faculty and students). We are time sharing with the high-school program which presents special challenges for professional classroom and lab atmosphere i.e.: Noise, horseplay.

iv) Instructional equipment, including instructional technology and its use.

a. The program has utilized the fundamental electronics equipment to good advantage for the changing skill demands of industry. This basic equipment is however becoming dated and is in need of deferred preventative maintenance.
b. Changing emphasis of the job market requires significant capital to meet the specific skill sets which are cyclical. The near term challenge is to provide an adequate Process Control laboratory. This equipment is more specialized and costly.
c. Additional capital is required to provide asynchronous distance learning for our non-traditional working student.

v) Library, including DVD, video, etc.

Library support is adequate and provides good reference materials to support the core competencies. The changing technical skills need additional asynchronous curriculum and course development. The WCCC campus has need of a dedicated student computer to supplement and augment class/ library support.

vi) Unique sources of revenue and expenditures
a. NSF funds have been obtained principally because we have shown the ability and agility to integrate our teaching curriculum to meet industry demand. This Grant will not support the post-secondary requirements required to meet the Process Control demand

E. **Effectiveness**

i. Accreditations by Professional, National, and International Associations are critical to the Technology Integration and Process Systems Technology degree programs, because the businesses and industries that support us require certifications when hiring our graduates. The programs is nationally and internationally certified by the following external organizations:

Certified curriculum (ETA Electronics Technicians Association)
Local Cisco Academy, Accredited by CISCO
Proposed Process Control certified by CAPT

ii. Changes since the most recent program review include the blending of the Network Technician and Telecommunications Engineering emphases into one. This change grew out of industry changes in which the telephones with network systems are combined utilizing Voice over Internet Protocol. Additionally, in working closely with the Math department we have restructured the UTEC 107 math class to more closely align with the Colorado Community College System (CCCS) and with the requirements of the mathematics department by developing MATH 108 Technical Mathematics. The staff has also restructured the Applied Physics course to align with the changes in the mathematics course.

The department has also begun the process of introducing an AAS in Process System Technology and a Certificate in a Process Maintenance Technician.

iii. Assessment of student academic achievements within the program includes the assessment process of Mesa State College (Appendix C). The department also keeps CCCS assessment records on completers, surveys, certifications, and skills Olympics.

iv. Faculty success data

Promotions
2005 One faculty promoted to Associate Technical Professor
2006 One faculty promoted to Assistant Technical Professor
2007 One faculty applying for Assistant Technical Professor

v. Teaching

Professional and student evaluations
Chamber of Commerce Outstanding Educator awards
CCCS Certification and mentoring approval

vi. Advising
Departmental
SOAR

vii. Scholarship
Industry Certifications
Professional Certifications
Bridge Courses
Continuing education coursework

viii. Service
Advisory committees Career Center, Job Corp, RMPBS
MSC service: Faculty Senate, Advising Committee, Information Technology support.

ix. Other
NSF Grant
Industry association work

x. Student success data

Awards
2005, State Skills Olympics Internetworking, Gold medal
2005, State Skills Olympics Computer Servicing, Gold medal
2005, National Skills Olympics Internetworking, placed 12th
2005, National Skills Olympics Computer Servicing, placed 4th
2006, State Skills Olympics Internetworking, Bronz medal

Certifications
2005 seven Associate Certified Electronics Technicians
2005 two A+ Certifications
2006 two Associate Certified Electronic Technicians

BAS degree students

Even though there are no current statistics for BAS students, we know of one graduate with a BAS degree and four students currently on the BAS path who have earned an AAS in Technology Integration.

F. Strengths Identified by the Review

The strengths identified by our internal review include strong support from our business advisory council and participation of businesses with internships, support of grants, and guest lectures. We are also accredited by external national and international organizations which enhance the placement and growth of our graduates.

Additionally, the program is enhanced by the quality and commitment of the faculty in scholarship, advising, service and professional development. The student's evaluations attest to the quality of education they are receiving.

G. Areas Needing Strengthening Identified by Review

The major area needing strengthening is the enrollments and graduation rates. The degree offerings require a very specialized student willing to commit to very rigorous coursework as demanded by the industry. Many of our international certifications only have a 39% pass rate. Our students are very easy to spot, they are just hard to find.

We know that there is a pool of qualified students in our service area and we need to develop a recruiting plan to reach out to those interested. There is also competition from other colleges and technical schools in the area that advertise heavily in our service area. Even though, their programs are more specialized and more expensive, they have a strong marketing component that attracts the type of student we need.

Finally, as we propose to launch a new degree which will strengthen the program, we will need to have equipment and trainers to be able to design our instruction around modern technologies to support the needs of local and regional businesses.

H. Vision

As previously mentioned, we are proposing to combine the Networking and Telecommunications emphases into one now that the Voice over Internet Protocol standards has been established. This will increase the headcount in all of the classes for a combined degree and it will help the faculty to student FTE numbers effectively. Additionally, with the

addition of the Process Systems Technology degree we will more effectively utilize faculty and resources. These changes will align the program with the needs of business and industry now and into the future.

With the addition of the Process Systems Technology degree the department has a need for updated and new equipment, faculty scholarship, and marketing support to effectively launch the degree. The technology we work with needs to be the same equipment and systems that our students will be using in the field; if not, we are doing the students a disservice and ineffectively supporting our business stakeholders. Some of the equipment and support can be solicited from the business partners, but the college needs to also support this critical new path.

Appendix A

Program Statistics for Past Five Years

Table 1

Headcount and Average Cumulative Credit Hours to Degree for Technology Integration Majors Graduating AY 2001 - 2005

Type of Entry into MSC	Headcount		Average
Student Type			
Began at MSC	28	71.8%	120.4
Transferred in to MSC	11	28.2%	103.3
Total Subtotal	**39**	**100.0%**	**115.6**

Table 2

Certificates and A.A.S. in Technology Integration Awarded by Major Code, Academic Years 2001 - 2005
Mesa State College

Level	Major Code	Program Name	Degree Attainment				
			2001	2002	2003	2004	2005
Certificate			0	0	0	0	0
A.A.S.							
	1326	Telecommunications Engineer	7	13	10	5	3
	1327	Certified Electronic Technician	0	0	0	0	1
TOTAL			7	13	10	5	4

Table 3

ONE-YEAR RETENTION RATE FOR FIRST-TIME TECHNOLOGY INTEGRATION 2000 - 2004
Mesa State College

Major Level	Code	Program Name	Retained Subsequent Fall #	%	Finished Certificate/Degree		Not Retained Subsequent Fall #	%	Total #	%
Certificate										
	1326	Telecommunications Engineer	7	43.8%	1	6.3%	8	50.0%	16	100.0%
	1327	Certified Electronic Technician	0	0.0%	0	0.0%	1	100.0%	1	100.0%
	1328	Network Technology	3	100.0%	0	0.0%	0	0.0%	3	100.0%
TOTAL			**10**	**50.0%**	**1**	**5.0%**	**9**	**45.0%**	**20**	**100.0%**

Table 4

COURSES BY COURSE LEVEL BY TERM AY 2006

Level/Course Level	Summer Courses		Fall Courses		Spring Courses		Total Courses	
Undergraduate								
Remedial - 000	0	-	0	0.0%	0	0.0%	0	0.0%
Lower - 100	0	-	9	64.3%	5	31.3%	14	46.7%
Lower - 200	0	-	5	35.7%	11	68.8%	16	53.3%
Upper - 300	0	-	0	0.0%	0	0.0%	0	0.0%
Upper - 400	0	-	0	0.0%	0	0.0%	0	0.0%
Subtotal Undergraduates	**0**	-	**14**	**100.0%**	**16**	**100.0%**	**30**	**100.0%**
Graduate								
Graduate - 500	0	-	0	0.0%	0	0.0%	0	0.0%
Subtotal Graduates	**0**	-	**0**	**0.0%**	**0**	**0.0%**	**0**	**0.0%**
Total	**0**	-	**14**	**100.0%**	**16**	**100.0%**	**30**	**100.0%**

Table 5

Techology Integration Faculty by Tenure Status, 2004-2006
Mesa State College

	Techology Integration	2003-2004 FTE		2004-2005 FTE		2005-2006 FTE	
		FTE	%	FTE	%	FTE	%
Status							
	Tenure	0.0	0.0%	0.0	0.0%	0.0	0.0%
	Tenure-Track	0.0	0.0%	0.0	0.0%	0.0	0.0%
Total Tenure		**0.0**	**0.0%**	**0.0**	**0.0%**	**0.0**	**0.0%**
	FT Instructor	4.0	93.0%	4.0	93.0%	4.0	100.0%
	PT Instructor	0.3	7.0%	0.3	7.0%	0.0	0.0%
TOTAL		**4.3**	**100.0%**	**4.3**	**100.0%**	**4.0**	**100.0%**

Table 6

MESA STATE COLLEGE
Technology Integration

	CAMPUS	DISCIPLINE	LEVEL	CH'S	TOTAL FACULTY COMPENSATION	(A) TOTAL OTHER COMPENSATION	(B) OTHER CURRENT EXPENDITURES	(C) OTHER INSTRUCTION	(D) ACADEMIC SUPPORT	(C) STUDENT SERVICES	(C) (E) INSTITUTIONAL SUPPORT	(C) PLANT	TOTAL COSTS	COSTS/ CREDIT HOUR
2004	Main	TCOM/TECI	LOWER	191	$ 54,209		$ 7,654		$ 8,440	$ 3,581	$ 3,272	$ 3,041	$ 80,197	$ 420
2004	Main		UPPER	-									-	#DIV/0!
2004			TOTAL	191	$ 54,209	$ -	$ 7,654	$ -	$ 8,440	$ 3,581	$ 3,272	$ 3,041	$ 80,197	$ 420
2005	Main	TECI	LOWER	636	$ 67,339		$ 21,917	$ 2,255	$ 27,557	$ 11,704	$ 9,061	$ 9,803	$ 149,636	$ 235
2005	Main		UPPER	-									-	#DIV/0!
2005			TOTAL	636	$ 67,339	$ -	$ 21,917	$ 2,255	$ 27,557	$ 11,704	$ 9,061	$ 9,803	$ 149,636	$ 235

(A) Includes department head stipends and support staff.
(B) Includes course fees and travel.
(C) Allocated by % of total credit hours.
(D) Allocated by % of total Faculty FTE.
(E) Includes instituitonal scholarships.

Appendix B

Faculty Vitae

VITAE

Ronald Sherman Wilcox, Assistant Professor
Applied Technology
Mesa State College/UTEC
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Professional Preparation

Master of Science in Management, Houston Baptist University	1983
Bachelor of Science in Electrical Engineering, Arizona State University	1971
Associate of Science in Engineering, Mesa State College	1963

Professional Certifications

Networks +, Certified Professional Computer Technology Industry Association	2003
I-Networks +, Certified Internet Systems Administrator, compTIA	2003
A+ Computer Support Professional, compTIA	2003
Certified Electronics Technician, International Society of Electronics Technicians	1995

Professional Credentials

Credential from the State of Colorado:

Marketing Management
Computers
Electronics Technology
Applied Mathematics

Professional Organizations

ETA KAPPA NU National Honorary Society for Electrical Engineers, past Vice President
TAU BETA PI National Honorary Society for Engineers, past Treasurer
American Mathematical Society

Appointments

Mesa State College/UTEC, Grand Junction, CO
Faculty; Assistant Professor; Technology Integration (1990-Present)

- Extensive experience developing curriculum and teaching technical subjects across several disciplines including Computer Information Systems Business, Electronics, Mathematics, and Telecommunications
- Continual curriculum improvement to keep pace with current technology
- Designed, developed, and taught Applied Mathematics for Technology curriculum for all technology students
- Served on the Presidents Computer Coordinating Committee
- Served in the Center for Technology, training faculty on new technology in the classroom for 13 years
- Served as School District 51 representative on Connections for Mathematics

University of Southern Colorado, Pueblo, CO
Adjunct Faculty; Organizational Behavior 1991

Candidate's Philosophy of Teaching

As a professional technician, design engineer, USAF Officer, program manager, business owner and professor; my teaching philosophy has been molded into a strong conviction that the learning must be applied. By that I mean regardless of diverse learning styles, and the myriad of pedagogical tools, the bottom line is; can this student perform in his desired discipline? Did the college experience enhance this individual ability to be a productive citizen, a skilled employee, a valued team member?

Can one teach work ethic? Most probably not. Can one model and reinforce work habits and commitment to the job, task, goals? Yes, by setting the example, by providing incentive, and by using measurable expectations.

Can the instructor impart critical thinking skills, cognitive skills, reasoning, cooperation, individual diligence? Yes, by example, by incentive, by setting expectations.

How might these desired goals best be reached? By first setting the expectations for attendance, preparations, inquiry, and communication. Whether it is managing a business, classroom or an individual project the successful student will gain valuable experience by modeling these traits.

My philosophy is that modeling these traits and providing "hands-on" experience is a valuable educational experience whether educating managers, engineers, scientists, technicians, or teachers.

My philosophy has been inculcated into each curriculum I have had the pleasure to design while at Mesa State College.

While I have only anecdotal information by which to measure how successfully I've applied this philosophy, there occasionally reaches my ears, a success story that makes it all worthwhile.

A sampling of graduates during my 14 year tenure at Mesa State College show:

- Successful business owners;
- Design engineers for Genesis Labs and Intel Semiconductor;
- Valued technicians for Halliburton in the oil production industry and Intel Semiconductor;
- FAA radio/radar technicians;
- Network administrators;
- Bicycle manufacturers;
- Telecommunications engineers;
- Bio Med technicians at St. Mary's Hospital;
- Digital technicians at Ametek/Dixson;
- Teachers; and
- Robotic technicians at General Production Devices

In response to industry's need for certified computer technicians, I applied for and received a grant to get the Computer Technology Industry Association's A+ Certification in the summer of 2003.

Subsequently, I have reinforced our ELCT260 Computer Support course and emphasized the A+ skills. This course has been integrated into our newly designed TECI curriculum as well as into the Computer Information Systems Business Curriculum.

In response to a request from the Montrose area for this A+ course, we developed the first distance learning course offered at Mesa State College. This was a real-time lecture lab hosted over the Pic-Tel system. The lab work was supported by an on-site facilitator and the final demonstration required the class to come to UTEC to demonstrate competency.

Development of the Applied Mathematics curriculum allowed me the opportunity to introduce a "hands-on" lab component. In this practical lab, the mathematical constructs become "real" as they solve job related problems (see attached).

GORDON P. KOCH

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OBJECTIVE

SUMMARY

Thirty years successful college experience including administration, supervision and coordination of educational and operational activities.

PROFESSIONAL EXPERIENCE

Sept. '01 – Present

Mesa State College, Grand Junction, CO
Electronics/Telecommunications Teacher

- Teach Electronics and CISCO for Electronics, Telecom Engineering, and Networking Technician degree paths.
- Initiated and implemented successful CISCO Academy Program with lab and online studies.
- Improved enrollment and student retention serving as role model and teacher.
- Instrumental in securing accreditation as an area-wide Assessment Committee Member.
- Have served as Interim Chair, Technology Integration Department.

Aug. '76 – Aug. '01

Mid-Plains Community College, North Platte, NE
Electronics Department Head

- Prepared budget, administered purchasing of supplies and equipment, managed labs, and supervised instructors.
- Coordinated Electronics Advisory Committee and served on College Committees.
- Developed new curriculum and methodologies for delivery.
- Served on three Hiring Committees for positions of Dean of Student Services and IT and HVAC Instructors.
- Taught second-year electronics, including Digital, Microprocessors, Communication Circuits, Computer Installation and Maintenance, Networking (Windows NT 4), and Industrial Process Control.

Division Coordinator

- Completed strategic planning of three programs within the division, developing curriculum and budget.

EDUCATION

- MS, Trades & Industry, University of Nebraska, Kearney, NE. 1993
- BS, Occupational Education, Kearney State College, Kearney, NE. 1988
- AA, Mid-Plains Community College, North Platte, NE. 1984
- Diploma, Electronics (Communications/Industrial Technology), United School of Electronic Trades, Milwaukee, WI, 1965
- Sonar Technology, US Navy, 1960 1963

AWARDS

- National Institute for Staff & Organizational Development Excellence Award 1996: Teaching & Leadership Excellence
- Special Recognition, Nebraska State VICA skills Olympics Chairman, 1993/94 & 1994/95

MANAGEMENT/LEADERSHIP ACCOMPLISHMENTS/EXPERIENCE

- National Chairman of Associate Certification Exam Committee for Electronics Technician Association International (ETA), Current
- Committee Chair, Education, ETA (current)
- Statewide Energy Project Grant Administrator on Automated Building Control Systems (Andover), 1986 – 1987. Also co-wrote curriculum and trained Trainers.
- VICA Advisor & Nebraska State Skill Olympics Coordinator, 1994 – 1996
- Owner/Manager, Consumer electronics business, 1968 - 1976

LICENSES/CERTIFICATIONS

- Master Certified Electronics Technician, Lifetime, CETma
- Cisco Certified Academy Instructor, CCNA, CCAI
- FCC License, Lifetime, General Radio Telephone
- Microsoft Certified Professional, MCP, (Windows NT-4)

PROFESSIONAL MEMBERSHIP

- Electronics Technician Association (ETA)
- Vocational Industrial Clubs of America (VICA)/US Skills Olympics
- Colorado Association for Career & Technical Education (ACTE), Trade & Industrial Dividsion
- The American Legion Post 0211

BIOGRAPHICAL SKETCH

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Professional Preparation

Colorado State University	Provisional Teacher License	License 2003
Colorado State University	Vocational Teacher Credential	Credential 1998
Southern Colorado State	General Education	No degree 1974
Buck Institute for Education	Project-Based Curriculum Dev.	Certificate 2002
Cisco Networking Academy	CCNA 1&2	Certificate 2003
Red Hat Global Learning	Linux System Administration	Certificate 2002
Intel Innovation in Education	Intel Master Teacher	Certificate 2001

Appointments

Mesa State College/WCCC, Grand Junction, CO
Faculty; Lead Instructor; Technology Integration (1997-Present)

- Teaching within the Technology Integration discipline. Directed the technical support personnel in equipment selection, ordering, deployment and configuration for computer technology and distance learning.
- Department Lead Instructor involved with all aspects of program development, renewal, curriculum changes, budgeting, scheduling, adjunct hiring, and staff development.
- Responsible for project based Curriculum development in all applied science, physics, mathematics and technology.
- National Science Foundation COPI, Integrated Learning Systems

Mesa State College/Western Colorado Community College, Grand Junction, CO
CIO/Division Chair; Interim Director Information Technology (CIO), Division Chair Technology Integration, Media Technology, Graphics Communications (2005-2006)

- Interim director of Information Technology (CIO) for Mesa Sate College, responsible for the management of all telecommunication, networking, systems support, and regulatory compliance of the department.
- Directed the implementation of baseline database changes within Banner for the College Opportunity Fund voucher initiative in Colorado.
- Designed and implemented a college wide PC replacement policy. Reorganized the Help-desk and work order tracking system.
- Continued with Division Chair responsibilities, including curriculum development and professional faculty/staff development.

Mesa State College/UTEC, Grand Junction, CO
Faculty; Lead Instructor; Technology Integration (1997-2004)

- Teaching within the Telecommunications Engineering discipline. Directed the technical support personnel in equipment selection, ordering, deployment and configuration for computer technology and distance learning.
- Department Lead Instructor involved with all aspects of program development, renewal and curriculum changes. Budgeting, scheduling, adjunct hiring, and staff development.
- Responsible for project based Curriculum development in all applied science, physics, mathematics and technology.
- Vice President Faculty Senate 2001

Information Technologies International, Inc., Grand Junction, CO
Owner, Chief Operating Officer (1993-1997)

- Director of Media Programs.
- Supervise all the stages involved with planning and production of multimedia programs and Internet Services, including technical support and customer service.
- Actively teaching and training Internet communications through the use of digital technology.
- Principal Consultant for Information Management Systems. Principal Expert/Consultant for photographic and video production.

RUST Geotech, Grand Junction, CO
Manager, Reproduction and Audiovisual Services (1988-1993)

- Responsible for all photographic, printing, audiovisual, and multimedia services for the U.S. Department of Energy Grand Junction Project Office.
- Managed the facility's copy center production, managed 12 employees.
- Responsible for budget and cost control.

UC West Photo Lab, Colorado Springs, CO
General Manager (1985-1987)

- Manager responsible for bringing the business to break-even in eight months.
- Supervised the purchase and installation of equipment.
- Responsible for employee hiring and training, responsible for inventory control, sales, marketing, and budgeting.

Williams and Meyer Co., Art Form Communications, K&S Photo, Chicago, IL
General Manager/ Freelance Designer (1982-1985)

- Managed a full-service photo laboratory with 80 employees.
- Operated the computer graphics and typesetting departments and monitored the chemical mixing process.
- Trained in Kodak E-6, C-41, and EP-2 processes.
- Experienced designer on Dicomed D-38, Micro II IBM, Micro I Apple, and FCG Beacon computer graphic systems.

Publications

Technology Integration, a systems approach to teaching technology in the classroom, submitted preliminary manuscript, in editorial review, estimated publication date October 2007.

Synergistic Activities

TeleCOOP of Colorado	Invited Oral Presentations	1998-2003

Collaborators & Other Affiliations

Advisory Committee Member, Career Center School District 51, Grand Junction, CO
Local Advisory Committee Member, Rocky Mountain PBS, KRMJ, Grand Junction, CO

I see my role, as an instructor, as a living/working example of the field of studies the student's wishes to pursue. A faculty member has a responsibility to guide students to learn and understand from real world examples. Education is more than simply laying out the facts and hoping the students are challenged. The role of a teacher is a larger responsibility, it is more important to reach out to those students wanting to learn and to draw in those students who are reluctant with practical knowledge that will prepare them for real world experiences. They need to acquire knowledge through relevant experiences and practice through extensive guidance from the faculty.

I have watched as students academic and personal accomplishments have moved them into newer realms of understanding by seeing the deep commitment and interaction of their instructor. Work performed within internships and with business cooperatives has proven to very valuable is showing the student practical application of the subject matter.

Finally, the instructor has a responsibility to stay abreast of developments in their field and to introduce those developments to their students. In the fast changing world of technology one can be left behind very quickly, which in turn is detrimental to the students. Professional development will always be an exciting and fulfilling part of my career.

Enclosed you will find an example of my syllabus, lesson plan, and the instructional framework of my courses.

JACK YON
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Clifton CO 81520
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EMAIL: j_p_yon@msn.com

Qualities

- Talented: Educator/Instructor/Teacher, Secondary and Post Secondary
- Versatile: Effective differentiated educator and teaching style
- Credentialed: Colorado; Technical Education and Trades/Industry
- Licensed: Colorado; Secondary Education, Electrical/Electronics Technology
- Certified: Cisco Networking Academy Instructor Semester 1 and 2

Experience History

May 2003 – To Current; Mesa State College, WCCC, CO.
Secondary school instructor for Technology Integration.
Post secondary for Transportation and UTEC General Education programs; specifically with needs in the Trades and Industry arena.

May 2001 – October 2002; IntelliTec Colleges, CO.
Private college, Instructor in Electronics, Business, and General Education courses. Held the positions of Facility Manager, Department Chair and the Dean of Faculty.

July 2000 – April 2001; SBM Site Services, CO.
Colorado Springs area manager. Responsible for training and managing personnel who provided site services to Agilent Technologies, Hewlett Packard and Intel Corporation.

December 1979 – June 2000; United States Navy
Conducted a broad range of technical, mechanical, instructional and managerial support functions to ensure optimal satisfaction of the United States Naval standards and expectations.

Education

Cisco Networking Academy (Instructor): (CO Mtn College, Glenwood Springs, CO)

CCNA 1 Networking Basics	August 2003
CCNA 2 Routers and Router Basics	December 2003
CCNA 3 Switching Basics and Intermediate Routing	Fall 2006

Vocational Alternative Teachers Licensure Program: (Colorado State University, CO)

VE471 Orientation & Assessment-New Teachers	September 2003
VE472 Classroom Management	October 2003
VE473 Communication Strategies	November 2003
VE486 Practicum	February 2004
VE494 Independent Study	March 2004

Technology Integration Associate of Applied Science:	(Mesa State College, CO)
TECI 117/L DC Passive Circuits/Lab	Spring 2005
TECI 118/L AC Passive Circuits/Lab	Spring 2005
UTEC 107 Math for Technology	Spring 2005
POLS 101 American Government	Summer 2005
TECI 132/L Intro IT Hardware/Sys Software/Lab	Fall 2005
TECI 164/L Electronic Circuits I/Lab	Fall 2005
TECI 170 Intro to Communications	Fall 2005
TECI 180 Cisco Networking 1	Fall 2005
TECI 290 Certification	Spring 2006
TECI 292 Capstone Tech Engineering	Spring 2006
UTEC 251 Leadership	Spring 2006

Coursework in Progress:	(Mesa State College, CO)
MAMT 207 Introduction to Statistical Process Control	Fall 2006
TECI 185 Cisco Networking 2	Fall 2006
TECI 230 Cisco Networking 3	Fall 2006
UTEC 120 Industrial Safety Practices	Fall 2006

Appendix C

Assessment Plan and Results

Assessment Record for Department of Technology Integration

Assessment Period: 2005 2006
Date Submitted:

Includes Assessment plan for those Instructional Programs listed below:

Title of Instructional Degree Program	Degree Level
Certified Electronics Technician	Associate of Applied Science AAS

Submitted by: Gordon Koch, Instructor

Mesa State College
Assessment Report

Degree Program: **Certified Electronics Technician**

Assessment Period Covered: 2005 to 2006
Date Submitted:

Expanded Statement of Institutional Purpose Linkage:

Mission Statement of School of Applied Technology:

Mesa State College shall maintain a community college role and mission, including vocational and technical programs. The college offers programs of value in areas of civic and cultural life, research, and recreation and desires to play a constructive role in the improving the quality of human life and the environment. In order to implement this philosophy, the College shall offer vocational technical programs leading to certificates and associate degrees; and continuing education programs directed toward personal, civic, vocational, and professional self-improvement.

School of Applied Technology Goals supported:

To meet the individual needs of each student, whether it be an employee retraining for new skills, a returning student, or a new student seeking career guidance. Each shall receive the specific training necessary so that they may achieve their personal goals.

Intended Education (Student) Outcomes:

1. Student shall apply knowledge and demonstrate ability to perform tasks of entry level electronics employment.

2. Student shall show application of mathematical data and reasoning skills in relation to design and troubleshooting of electronic circuits.

3. Student will demonstrate ability to apply electronic theory while working independently into the design, troubleshooting, and repair of electronic circuits.

Mesa State College
Assessment Report

Degree Program: Certified Electronics Technician

Assessment Period Covered: 2005 to 2006
Date Submitted: _____

Intended Educational (Student) Outcome:

NOTE: There should be one form C for each intended outcome on form B. Intended outcome should be restated in the box immediately below and the intended outcome number entered in the blank spaces.

1. Student shall apply knowledge and demonstrate ability to perform tasks of entry level electronics employment.

First Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Graduate follow-up survey item 4d **(usefulness of training), 6a (solve problems), 6j (work with others) and 6k (follow directions)** from 6 mos graduate survey, *Student Services.* Positive expectation/graduate follow-up survey shows 80% from good to very good. Survey scales from poor to very good (1-5).

Summary of Assessment Data Collected:

Graduates surveyed felt training was adequately useful for their job position. Fails/meets/surpasses expectation. Results:

Use of Results to Improve Instructional Program

Action required is:

Second Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Associate Certified Electronics Technicians Exam, CETa, *(administered through the Electronics Technicians Association), positive expectation/80% pass rate. Exam is administered near end of fourth semester training. The CETa is an internationally recognized standardized exam which tests on theory, design, troubleshooting, and repair of electronic circuits.*

Summary of Assessment Data Collected:

Results:

Use of Results to Improve Instructional Program

Action required is:

Mesa State College
Assessment Report

Degree Program: Certified Electronics Technician

Assessment Period Covered: 2005 to 2006
Date Submitted:

Intended Educational (Student) Outcome:
NOTE: There should be one form C for each intended outcome on form B. Intended outcome should be restated in the box immediately below and the intended outcome number entered in the blank spaces.

2. Student shall show application of mathematical data and reasoning skills in relation to design and troubleshooting of electronic circuits.

First Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:
Graduate follow-up survey item 6e **(use math skills to solve practical and/or theoretical problems)** from 6 mos graduate survey, *Student Services*. Positive expectation/graduate follow-up survey shows 80% from good to very good. Survey scales from poor to very good (1-5).

Summary of Assessment Data Collected:
Graduates surveyed felt training was adequately useful for their job position. Fails/meets/surpasses expectation. Results:

Use of Results to Improve Instructional Program
Action required is:

Second Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:
Employer Follow-up Survey item 3m **(mathematical problem solving skills)** from 6 mos employer follow-up survey, *Student Services*. Positive expectation/employer follow-up survey shows 80% from good to very good. Survey scales from poor to very good (1-5).

Summary of Assessment Data Collected:
Employers surveyed felt training was adequately useful for the job position. Fails/meets/surpasses expectation. Results:

Use of Results to Improve Instructional Program
Action required is:

Third Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:
Pass FCC Licensing exam. (Standardized Federal Communications Commision Licensing Exam) 75%.

Summary of Assessment Data Collected:
Results:

Use of Results to Improve Instructional Program
Action required is:

Mesa State College
Assessment Report

Degree Program: **Certified Electronics Technician**

Assessment Period Covered: 2005 to 2006
Date Submitted:

Intended Educational (Student) Outcome:

NOTE: There should be one form C for each intended outcome on form B. Intended outcome should be restated in the box immediately below and the intended outcome number entered in the blank spaces.

3. Student will demonstrate ability to apply electronic theory while working independently in the design, troubleshooting, and repair of electronic circuits.

First Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Graduate follow-up survey item 6a **(solve problems),** item 6b, **(generate original ideas or products)** from 6 mos graduate survey, *Student Services.* Positive expectation/graduate follow-up survey shows 80% from good to very good. Survey scales from poor to very good (1-5).

Summary of Assessment Data Collected:

Graduates surveyed felt training was adequately use for their job position. Fails/meets/surpasses expectation. Results:

Use of Results to Improve Instructional Program

Action required is:

Second Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Employer Follow-up Survey items **3e (work quantity)** and **3p (organizational ability) 3a (technical knowledge) and 3d (quality of work),**from 6 mos employer follow-up survey, *Student Services.* Positive expectation/employer follow-up survey shows 80% from good to very good. Survey scales from poor to very good (1-5).

Summary of Assessment Data Collected:

Employers surveyed felt training was adequately useful for the job position. Fails/meets/surpasses expectation. Results:

Use of Results to Improve Instructional Program

Action required is:

Third Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Capstone Course, TECI 292. The capstone consists of a combined design project including students from all three degree paths. Industry Representatives are invited to a show and tell session where the students present the final project. The project is evaluated by the industry representatives and feedback is shared with the presenting students. Additional project evaluations are based on peer grading and grades issued by coordinating instructors. Results are summarized on the attached summary sheet. Students will successfully complete the capstone course (TECI 292) with a letter grade of C or better.

Summary of Assessment Data Collected:

Refer to summary sheet

Use of Results to Improve Program

Action required is:

Summary
Graduates, AAS Degree - Certified Electronics Technician
Spring 2006

Student	Certification & #	Employment,	Location
#1			
#2			
#3			
#4			
#5			
#6			

Other certified, (undergraduate students)

#7

Number of Graduates & Employment Information

Capstone

Comments

Assessment Record for
Department
of
Technology Integration

Assessment Period: 2005 2006
Date Submitted:

Includes Assessment plan for those
Instructional Programs listed below:

Title of Instructional Degree Program	Degree Level
Network Technician	Associate of Applied Science AAS

Submitted by: Gordon Koch, Instructor

Mesa State College
Assessment Report

Degree Program: **AAS-Network Technician**

Assessment Period Covered: 2005 to 2006
Date Submitted: _____

Expanded Statement of Institutional Purpose Linkage:

Mission Statement of School of Applied Technology:

Mesa State College shall maintain a community college role and mission, including vocational and technical programs. The college offers programs of value in areas of civic and cultural life, research, and recreation and desires to play a constructive role in the improving the quality of human life and the environment. In order to implement this philosophy, the College shall offer vocational technical programs leading to certificates and associate degrees; and continuing education programs directed toward personal, civic, vocational, and professional self-improvement.

School of Applied Technology Goals supported:

To meet the individual needs of each student, whether it be an employee retraining for new skills, a returning student, or a new student seeking career guidance. Each shall receive the specific training necessary so that they may achieve their personal goals.

Intended Education (Student) Outcomes:

1. Student shall be able to perform tasks of entry level network technician.

2. Student shall demonstrate personal work characteristics that contribute to effective network technician job performance.

3. Student shall demonstrate effective use of communication skills appropriate to network technician specialty.

4. Student shall show application of mathematical data and reasoning skills in relation to design, troubleshooting, and repair of networks.

Mesa State College
Assessment Report

Degree Program: **AAS-Network Technician**

Assessment Period Covered: 2005 to 2006
Date Submitted: _____

Intended Educational (Student) Outcome:

NOTE: There should be one form C for each intended outcome on form B. Intended outcome should be restated in the box immediately below and the intended outcome number entered in the blank spaces.

1. Student shall be abe to perform tasks of entry level network employment.

First Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Graduate follow-up survey item 4d **(usefulness of training)** from 6 mos graduate survey, *Student Services.* Positive expectation/graduate follow-up survey shows 80% from good to very good. Survey scales from poor to very good (1-5).

Summary of Assessment Data Collected:

Graduates surveyed felt training was adequately useful for their job position. Fails/meets/surpasses expectation. Results ___%

Use of Results to Improve Instructional Program

Action required is: _____.

Second Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Employer survey: Employer satisfaction with graduates ability to do their job properly. Responses to questions 3a **(technical knowledge)** and 3d **(quality of work)**, *Student Services.* Positive expectation/employer satisfaction shows 80% from good to very good. Survey scales from poor to very good (1-5).

Summary of Assessment Data Collected:

Employers felt that graduates were able to perform quality of work. Fails/meets/surpasses expectation. Results ___%

Use of Results to Improve Instructional Program

Action required is: ____.

Third Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:
Network+ Certification administered through Sylvan Prometric test sites, *positive expectation/80% pass rate. Exam is administered near end of fourth semester training. The Network+ is an internationally recognized standardized exam which tests on theory, design, troubleshooting, and repair of networks.*

Summary of Assessment Data Collected:
Results ___%

Use of Results to Improve Instructional Program
Action required is: _____.

Mesa State College
Assessment Report

Degree Program: **AAS-Network Technician**

Assessment Period Covered: 2005 to 2006
Date Submitted: _____

Intended Educational (Student) Outcome:

NOTE: There should be one form C for each intended outcome on form B. Intended outcome should be restated in the box immediately below and the intended outcome number entered in the blank spaces.

2. Student shall demonstrate personal work characteristics that contribute to effective network technician job performance.

First Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Case-Study, fourth semester Cisco training. Final evaluation of student contribution towards project success. Grade to exceed 85%.

Summary of Assessment Data Collected:

Evaluative summary of Case Study --- (see summary sheet). Grades consist of: oral presentations, peer group evaluations, and project design criteria (Cisco requirements) Fails/meets/surpasses expectation. Results ___%

Use of Results to Improve Instructional Program

Action required is: ____.

Second Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Employer survey: Employer satisfaction with graduates ability to do their job properly. Responses to questions 3h. **(follow instructions)** and 3g **(relationship with others)**, *Student Services. Positive expectation/employer satisfaction shows 80% from (good to very good).*

Summary of Assessment Data Collected:

Employers surveyed felt training was adequately useful for the job position. Fails/meets/surpasses expectation. Results ___%

Use of Results to Improve Instructional Program

Action required is: ____.

Mesa State College
Assessment Report

Degree Program: **AAS-Network Technician**

Assessment Period Covered: 2005 to 2006
Date Submitted: _____

Intended Educational (Student) Outcome:

NOTE: There should be one form C for each intended outcome on form B. Intended outcome should be restated in the box immediately below and the intended outcome number entered in the blank spaces.

3. Student shall demonstrate effective use of communication skills appropriate to network technician specialty.

First Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Graduate follow-up survey items 6c **(use effective oral communication)** and 6d **(effective written communication)** from 6 mos graduate survey, *Student Services. Positive expectation/graduate follow-up survey shows 80% (from good to very good).*

Summary of Assessment Data Collected:

Graduates surveyed felt training was adequately useful for their job position. Fails/meets/surpasses expectation. Results ___%

Use of Results to Improve Instructional Program

Action required is: ____.

Second Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Students shall meet Cisco Academy Communication Competencies with show of **Certificates and Letters**. Certificates and Letters are only awarded to Cisco students meeting 75% of Cisco course competencies. (see summary sheet).

Summary of Assessment Data Collected:

85% of Cisco Academy completers will receive **Letters and Certificates**. Fails/meets/surpasses expectation. Results ___%

Use of Results to Improve Instructional Program

Action required is: ____.

Mesa State College
Assessment Report

Degree Program: **AAS-Network Technician**

Assessment Period Covered: 2005 to 2006
Date Submitted: _____

Intended Educational (Student) Outcome:

NOTE: There should be one form C for each intended outcome on form B. Intended outcome should be restated in the box immediately below and the intended outcome number entered in the blank spaces.

4. Student shall show application of mathematical data and reasoning skills in relation to design, troubleshooting and repair of networks.

First Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Graduate follow-up survey item 6e **(use math skills to solve practical and/or theoretical problems)** from 6 mos graduate survey, *Student Services.* Positive expectation/graduate follow-up survey shows 80% from good to very good. Survey scales from poor to very good (1-5).

Summary of Assessment Data Collected:

Graduates surveyed felt training was adequately useful for their job position. Fails/meets/surpasses expectation. Results ___%

Use of Results to Improve Instructional Program

Action required is: ____.

Second Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Employer Follow-up Survey item 3m **(mathematical problem solving skills)** from 6 mos employer follow-up survey, *Student Services.* Positive expectation/employer follow-up survey shows 80% from good to very good. Survey scales from poor to very good (1-5).

Summary of Assessment Data Collected:

Employers surveyed felt training was adequately useful for the job position. Fails/meets/surpasses expectation. Results ___%

Use of Results to Improve Instructional Program

Action required is: ____.

Mesa State College
Assessment Report

Third Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:
Pass Industry Certification Exams (CCNA, Intro and CCNA, ICND) Of students electing to to take Industry certification exams. Positive expectation 80% pass rate.

Summary of Assessment Data Collected:
Intro exam pass rate=
ICND pass rate=

Use of Results to Improve Program
Action required is:

Summary
Graduates, AAS Degree - Network Technician
Spring 2006

Student	Certification & #	Employment,	Location

Other certified, (undergraduate students)

Number of Graduates & Employment Information

Capstone

Comments

Mesa State College
Assessment Report

Assessment Record for
Department
of
Technology Integration

Assessment Period: 2005 2006
Date Submitted:

Includes Assessment reports for those
Instructional Programs listed below:

Title of Instructional Degree Program	Degree Level
Telecommunications Engineer	**Associate of Applied Science AAS**

Submitted by: **John Sluder, Dept Head/Instructor**

Mesa State College
Assessment Report

Degree Program: **Telecommunications Engineer**

Assessment Period Covered: 2005 to 2006
Date Submitted:

Expanded Statement of Institutional Purpose Linkage:

Mission Statement of School of Applied Technology:

Mesa State College shall maintain a community college role and mission, including vocational and technical programs. The college offers programs of value in areas of civic and cultural life, research, and recreation and desires to play a constructive role in the improving the quality of human life and the environment. In order to implement this philosophy, the College shall offer vocational technical programs leading to certificates and associate degrees; and continuing education programs directed toward personal, civic, vocational, and professional self-improvement.

School of Applied Technology Goals supported:

To meet the individual needs of each student, whether it be an employee retraining for new skills, a returning student, or a new student seeking career guidance. Each shall receive the specific training necessary so that they may achieve their personal goals.

Intended Education (Student) Outcomes:

1. Student shall be able to perform tasks of entry level telecommunications employment.

2. Student will demonstrate an understanding of personal work characteristics that contribute to effective job performance.

3. Student shall demonstrate effective use of communication skills appropriate to technical specialty.

4. Student shall demonstrate ability to solve telecommunications problems while working independently.

6. Summary Sheet

Summary
Graduates, AAS Degree - Telecommunications Engineer
Spring 2005

Student	Certification & #	Employment,	Location
Student	AC10270	Telecom, MSC	Grand Junction
Student 2	AC10305		
Student 3	AC10271	ACS Telcom	Grand Junction
Student 4	AC10273		
Student 5	AC10269		
Stusent 6	AC10268	Cont - BAT student	MSC, GJ

Other certified, (undergraduate students)

Student 7	AC103272	Cont - CET student	MSC, GJ

Number of Graduates & Employment Information

Six students graduated with an electronics degree with one unable to complete because of family issues
He has since returned and will graduate spring of 2006.

Capstone

The capstone consisted of a combined design project including students from all three paths. The project required designing a computer controlled home electronic entertainment and security system. Industry representatives were invited ited to a Show & tell meeting where students presented the project and industry shared constructiv critisism.
The project required a tream effort in researching modern control methods inccluding; networking, electronic control (through the home electrical system), security access, and project management.

Comments

Another show of student success are the results of two of our students competing at the National Skills Contests in "Computer Maintenance & Repair" and "Internetworking" competitions. at Kansas City this past summer.
One Student placed 12th out of 24 competitors, : tors at the national level in the departments first ever involvement in Internetworking competition. Several challengers were competing for the second time.
Another student placed 4th in Computer Maintenace and Repair and also gained his A+ certification at nationals.

Mesa State College
Assessment Report

Degree Program: Telecommunications Engineer

Assessment Period Covered: 2004 to 2005
Date Submitted:

Intended Educational (Student) Outcome:

NOTE: There should be one form C for each intended outcome on form B. Intended outcome should be restated in the box immediately below and the intended outcome number entered in the blank spaces.

2. Student will demonstrate an understanding of personal work characteristics that contribute to effective job performance.

Third Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:
Case Study/Capstone

Summary of Assessment Data Collected:

Use of Results to Improve Instructional Program
Action required is:

Mesa State College
Assessment Report

Degree Program: Telecommunications Engineer

Assessment Period Covered: 2004 to 2005
Date Submitted: _____

Intended Educational (Student) Outcome:

NOTE: There should be one form C for each intended outcome on form B. Intended outcome should be restated in the box immediately below and the intended outcome number entered in the blank spaces.

3. Student shall demonstrate effective use of communication skills appropriate to technical specialty.

First Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Graduate follow-up survey item 6c **(use effective oral communication)** and 6d **(use effective written communication)** from 6 mos graduate survey, *Student Services.* Positive expectation/graduate follow-up survey shows 80% from good to very good. Survey scales from poor to very good (1-5).

Summary of Assessment Data Collected:

Graduates surveyed felt training was adequately useful for their job position. Fails/meets/surpasses expectation.
Results: **6c) of 20% responders, 100% reported Good. 6d) of 20% responders, 100% reported Very Good**

Use of Results to Improve Instructional Program

Action required is: **Meets expectation, continue measures.**

Second Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Employer Follow-up Survey item 3k **(effective written communication)** and 3p **(organizational ability)** from 6 mos employer follow-up survey, *Student Services.* Positive expectation/employer follow-up survey shows 80% (from good to very good). Oral presentation of capstone course projects, reviewed by guest employers/reviewers.

Summary of Assessment Data Collected:

Employers surveyed felt training was adequately useful for the job position. Fails/meets/surpasses expectation.

Results: No data available

Use of Results to Improve Instructional Program

Action required is: **Continue survey.**

Mesa State College
Assessment Report

Degree Program: **Telecommunications**

Assessment Period Covered: 2004 to
Date Submitted: _____

Intended Educational (Student) Outcome:

NOTE: There should be one form C for each intended outcome on form B. Intended outcome should be restate immediately below and the intended outcome number entered in the blank spaces.

4. Student shall demonstrate ability to solve telecommunication problems while workin independently.

First Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Graduate follow-up survey item 4d, **(usefulness of training)** 6e, **(Use Math Skills to Solve Practical and/or Problems)** from 6 mos graduate survey, *Student Services.* Positive expectation /graduate follow-up survey sho good to very good satisfaction with having been taught a proper understanding of work expectations. Survey scal very good (1-5).

Summary of Assessment Data Collected:

Graduates surveyed felt training was adequately useful for their job position. Fails/**meets**/surpasses expectatio Results: **6e) of 20% responders, 100% reported Very Good .**

Use of Results to Improve Instructional Program

Action required is: **Meets expectation, continue measure**

Second Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Employer Follow-up Survey item 3m, **(Mathematical Problem Solving Skills)** 3p, **(Organizational ability) Motivation)** from 6 mos employer follow-up survey, *Student Services.* Positive expectation /employer follow 80% (from good to very good). Oral presentation of capstone course projects, reviewed by guest employers/revi

Summary of Assessment Data Collected:

Employers surveyed felt training was adequately useful for the job position. Fails/meets/surpasses expectation.

No data available

Use of Results to Improve Instructional Program

Action required is: **Continue survey.**

Mesa State College
Assessment Report

Degree Program: Telecommunications Engineer

Assessment Period Covered: 2005 to 2006
Date Submitted: _____

Intended Educational (Student) Outcome:

NOTE: There should be one form C for each intended outcome on form B. Intended outcome should be restated in the box immediately below and the intended outcome number entered in the blank spaces.

1. Student shall demonstrate knowledge to perform tasks of entry level telecommunications employment.

First Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Employer survey: Employer satisfaction with graduates ability to do their job properly. Responses to questions 3a **(technical knowledge)** and 3d **(quality of work),** *Student Services.* Positive expectation/employer satisfaction shows 80% from good to very good. Survey scales from poor to very good (1-5).

Summary of Assessment Data Collected:

Employers felt that graduates were able to perform quality of work. Fails/meets/surpasses expectation. Results

Use of Results to Improve Instructional Program

Action required is:

Second Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Networking Plus Certification Exam, N +, *(Sylvan Prometric), positive expectation 80% pass rate.*
Cisco CCNA basic certification Exam *(Sylvan Prometric), positive expectation 80% pass rate.*

Summary of Assessment Data Collected:

Results ___%

Use of Results to Improve Instructional Program

Action required is: _____

Mesa State College
Assessment Report

Degree Program: Telecommunications Engineer

Assessment Period Covered: 2005 to 2006
Date Submitted:

Intended Educational (Student) Outcome:

NOTE: There should be one form C for each intended outcome on form B. Intended outcome should be restated in the box immediately below and the intended outcome number entered in the blank spaces.

2. Student will demonstrate an understanding of personal work characteristics that contribute to effective job performance.

First Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Graduate follow-up survey items 6a **(solve problems)**, 6j **(work with others)**, and 6k **(follow directions)** from 6 mos graduate survey, *Student Services*. Positive expectation/graduate follow-up survey shows 80% from good to very good. Survey scales from poor

Summary of Assessment Data Collected:

Graduates surveyed felt training was adequately useful for their job position. Fails/meets/surpasses expectation.
Results:

Use of Results to Improve Instructional Program

Action required is:

Second Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Employer survey: Employer satisfaction with graduates ability to do their job properly. Responses to questions 3h **(follow instructions)** and 3g **(relationship with others)**, *Student Services*. Positive expectation/employer satisfaction shows 80% from good to

Summary of Assessment Data Collected:

Employers surveyed felt training was adequately useful for the job position. Fails/meets/surpasses expectation.

Results:

Use of Results to Improve Instructional Program

Action required is:

Mesa State College
Assessment Report

Degree Program: **Telecommunications Engineer**

Assessment Period Covered: 2005 to 2006
Date Submitted:

Intended Educational (Student) Outcome:

NOTE: There should be one form C for each intended outcome on form B. Intended outcome should be restated in the box immediately below and the intended outcome number entered in the blank spaces.

2. Student will demonstrate an understanding of personal work characteristics that contribute to effective job performance.

Third Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:
Case Study/Capstone

Summary of Assessment Data Collected:

Use of Results to Improve Instructional Program
Action required is:

Mesa State College
Assessment Report

Degree Program: Telecommunications Engineer

Assessment Period Covered: 2005 to 2006
Date Submitted:

Intended Educational (Student) Outcome:

NOTE: There should be one form C for each intended outcome on form B. Intended outcome should be restated in the box immediately below and the intended outcome number entered in the blank spaces.

3. Student shall demonstrate effective use of communication skills appropriate to technical specialty.

First Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Graduate follow-up survey item 6c **(use effective oral communication)** and 6d **(use effective written communication)** from 6 mos graduate survey, *Student Services.* Positive expectation/graduate follow-up survey shows 80% from good to very good. Survey scales from poor to very good (1-5).

Summary of Assessment Data Collected:

Graduates surveyed felt training was adequately useful for their job position. Fails/meets/surpasses expectation.
Results:

Use of Results to Improve Instructional Program

Action required is:

Second Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Employer Follow-up Survey item 3k **(effective written communication)** and 3p **(organizational ability)** from 6 mos employer follow-up survey, *Student Services.* Positive expectation/employer follow-up survey shows 80% (from good to very good). Oral presentation of capstone course projects, reviewed by guest employers/reviewers.

Summary of Assessment Data Collected:

Employers surveyed felt training was adequately useful for the job position. Fails/meets/surpasses expectation.
Results:

Use of Results to Improve Instructional Program

Action required is:

Mesa State College
Assessment Report

Degree Program: **Telecommunications Engineer**

Assessment Period Covered: 2005 to 2006
Date Submitted: _____

Intended Educational (Student) Outcome:

NOTE: There should be one form C for each intended outcome on form B. Intended outcome should be restated in the box immediately below and the intended outcome number entered in the blank spaces.

4. Student shall demonstrate ability to solve telecommunication problems while working independently.

First Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Graduate follow-up survey item 4d, **(usefulness of training)** 6e, (Use **Math Skills to Solve Practical and/or Theoretical Problems)** from 6 mos graduate survey, *Student Services.* Positive expectation /graduate follow-up survey shows 80% from good to very good satisfaction with having been taught a proper understanding of work expectations. Survey scales from poor to very good (1-5).

Summary of Assessment Data Collected:

Graduates surveyed felt training was adequately useful for their job position. Fails/**meets**/surpasses expectation.
Results:

Use of Results to Improve Instructional Program

Action required is:

Second Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Employer Follow-up Survey item 3m, **(Mathematical Problem Solving Skills**) 3p, **(Organizational ability)** 3q, **(Self Motivation)** from 6 mos employer follow-up survey, *Student Services.* Positive expectation /employer follow-up survey shows 80% (from good to very good). Oral presentation of capstone course projects, reviewed by guest employers/reviewers

Summary of Assessment Data Collected:

Employers surveyed felt training was adequately useful for the job position. Fails/meets/surpasses expectation. Results
%

Use of Results to Improve Instructional Program

Action required is:

Summary
Graduates, AAS Degree - Telecommunications Engineer
Spring 2006

Student	Certification & #	Employment,	Location

Other certified, (undergraduate students)

Number of Graduates & Employment Information

Capstone

Comments

Mesa State College
Assessment Report

Assessment Record for
Department
of
Technology Integration

Assessment Period: 2004 2005
Date Submitted: Oct-05

Includes Assessment reports for those
Instructional Programs listed below:

Title of Instructional Degree Program	Degree Level
Certified Electronics Technician	Associate of Applied Science AAS

Submitted by: Gordon Koch, Instructor

Mesa State College
Assessment Report

Degree Program: **Certified Electronics Technician**

Assessment Period Covered: 2004 to 2005
Date Submitted: _____

Expanded Statement of Institutional Purpose Linkage:

Mission Statement of School of Applied Technology:

Mesa State College shall maintain a community college role and mission, including vocational and technical programs. The college offers programs of value in areas of civic and cultural life, research, and recreation and desires to play a constructive role in the improving the quality of human life and the environment. In order to implement this philosophy, the College shall offer vocational technical programs leading to certificates and associate degrees; and continuing education programs directed toward personal, civic, vocational, and professional self-improvement.

School of Applied Technology Goals supported:

To meet the individual needs of each student, whether it be an employee retraining for new skills, a returning student, or a new student seeking career guidance. Each shall receive the specific training necessary so that they may achieve their personal goals.

Intended Education (Student) Outcomes:

1. **Student shall demonstrate knowledge to perform tasks of entry level electronics employment.**
2. **Student shall demonstrate an understanding of personal work characteristics that contribute to effective job performance.**
3. **Student shall demonstrate effective use of communication skills appropriate to technical specialty.**
4. **Student shall demonstrate use of mathematical data and reasoning skills in relation to design and troubleshooting of electronic circuits.**
5. **Student shall demonstrate ability to apply electronic theory while working independently into the design, troubleshooting, and repair of electronic circuits.**
6. **Instructor summary sheet.**

Mesa State College
Assessment Report

Degree Program: Certified Electronics Technician

Assessment Period Covered: 2004 to 2005
Date Submitted: _____

Intended Educational (Student) Outcome:

NOTE: There should be one form C for each intended outcome on form B. Intended outcome should be restated in the box immediately below and the intended outcome number entered in the blank spaces.

1. Student shall demonstrate knowledge to perform tasks of entry level electronics employment.

First Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Graduate follow-up survey item 4d **(usefulness of training)** from 6 mos graduate survey, *Student Services.* Positive expectation/graduate follow-up survey shows 80% from good to very good. Survey scales from poor to very good (1-5).

Summary of Assessment Data Collected:

Graduates surveyed felt training was adequately useful for their job position. Fails/meets/surpasses expectation. **Results: of a 40% response, 50% rated good, 50% average**

Use of Results to Improve Instructional Program

Action required is: **Does not meet expectations.**

Second Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Employer survey: Employer satisfaction with graduates ability to do their job properly. Responses to questions 3a **(technical knowledge)** and 3d **(quality of work)**, *Student Services.* Positive expectation/employer satisfaction shows 80% from good to very good. Survey scales from poor to very good (1-5).

Summary of Assessment Data Collected:

Employers felt that graduates were able to perform quality of work. Fails/meets/surpasses expectation. Results **No responses from employers**

Use of Results to Improve Instructional Program

Action required is: **None, should collect more data next year**

Third Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:
Associate Certified Electronics Technicians Exam, CETa, *(administered through the Electronics Technicians Association), positive expectation/80% pass rate. Exam is administered near end of fourth semester training. The CETa is an internationally recognized standardized exam which tests on theory, design, troubleshooting, and repair of electronic circuits.*

Summary of Assessment Data Collected:
Results: Of six graduating AAS degree students, all passed the Associate CET Certification examwith a success rate of 83% and better.

Use of Results to Improve Instructional Program
Action required is: Certification gets jobs! Continue this measure with high expectations. New on-line Web-CT course to be offered spring 2006, (CETa) exam prep.

Mesa State College
Assessment Report

Degree Program: **Certified Electronics Technician**

Assessment Period Covered: 2004 to 2005
Date Submitted:

Intended Educational (Student) Outcome:

NOTE: There should be one form C for each intended outcome on form B. Intended outcome should be restated in the box immediately below and the intended outcome number entered in the blank spaces.

2. Student shall demonstrate an understanding of personal work characteristics that contribute to effective job performance.

First Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Graduate follow-up survey items 6a **(solve problems)**, 6j **(work with others)** and 6k **(follow directions)** from 6 mos graduate survey, *Student Services. Positive expectation/alumni follow-up survey shows 80% (from good to very good).*

Summary of Assessment Data Collected:

Graduates surveyed felt training was adequately useful for their job position. Fails/meets/surpasses expectation. Results: **6j,of a 40% response, 50% rated good, 50% average. 6k, of a 40% response, 50% very good, 50% average.**

Use of Results to Improve Instructional Program

Action required is: **Continue monitoring.**

Second Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Employer survey: Employer satisfaction with graduates ability to do their job properly. Responses to questions 3h. **(follow instructions)** and 3g **(relationship with others)**, *Student Services. Positive expectation/employer satisfaction shows 80% from (good to very good).*

Summary of Assessment Data Collected:

Employers surveyed felt training was adequately useful for the job position. Fails/meets/surpasses expectation. Results: **No responses from employers**

Use of Results to Improve Instructional Program

Action required is: Will attempt to collect more data next year.

Mesa State College
Assessment Report

Degree Program: Certified Electronics Technician

Assessment Period Covered: 2004 to 2005
Date Submitted: _____

Intended Educational (Student) Outcome:

NOTE: There should be one form C for each intended outcome on form B. Intended outcome should be restated in the box immediately below and the intended outcome number entered in the blank spaces.

3. Student shall demonstrate effective use of communication skills appropriate to technical specialty.

First Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Graduate follow-up survey items 6c **(use effective oral communication)** and 6d **(effective written communication)** from 6 mos graduate survey, *Student Services. Positive expectation/graduate follow-up survey shows 80% (from good to very good).*

Summary of Assessment Data Collected:

Graduates surveyed felt training was adequately useful for their job position. Fails/meets/surpasses expectation. Results: **6c,of a 40% response, 50% rated good, 50% average. 6d, of a 40% response, 50% very good, 50% average.**

Use of Results to Improve Instructional Program

Action required is: **Continue monitoring.**

Second Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Employer Follow-up Survey item 3k **(effective written communication)** from 6 mos employer follow-up survey, *Student Services.* Positive expectation/employer follow-up survey shows 80% from good to very good. Survey scales from poor to very good (1-5).

Summary of Assessment Data Collected:

Employers surveyed felt training was adequately useful for the job position. Fails/meets/surpasses expectation. Results: **No responses from employers**

Use of Results to Improve Instructional Program

Action required is: Will attempt to collect more data next year.

Mesa State College
Assessment Report

Degree Program: **Certified Electronics Technician**

Assessment Period Covered: 2004 to 2005
Date Submitted: _____

Intended Educational (Student) Outcome:

NOTE: There should be one form C for each intended outcome on form B. Intended outcome should be restated in the box immediately below and the intended outcome number entered in the blank spaces.

4. Student shall demonstrate use of mathematical data and reasoning skills in relation to design and troubleshooting of electronic circuits.

First Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Graduate follow-up survey item 6e **(use math skills to solve practical and/or theoretical problems)** from 6 mos graduate survey, *Student Services.* Positive expectation/graduate follow-up survey shows 80% from good to very good. Survey scales from poor to very good (1-5).

Summary of Assessment Data Collected:

Graduates surveyed felt training was adequately useful for their job position. Fails/meets/surpasses expectation. Results: **6c,of a 40% response, 50% rated very good, 50% average. 6d, of a 40% response, 50% very good, 50% average.**

Use of Results to Improve Instructional Program

Action required is: **Continue monitoring.**

☐

Second Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Employer Follow-up Survey item 3m **(mathematical problem solving skills)** from 6 mos employer follow-up survey, *Student Services.* Positive expectation/employer follow-up survey shows 80% from good to very good. Survey scales from poor to very good (1-5).

Summary of Assessment Data Collected:

Employers surveyed felt training was adequately useful for the job position. Fails/meets/surpasses expectation. Results: **No responses from employers**

Use of Results to Improve Instructional Program

Action required is: Will attempt to collect more data next year.

Mesa State College
Assessment Report

Degree Program: **Certified Electronics Technician**

Assessment Period Covered: 2004 to 2005
Date Submitted:

Intended Educational (Student) Outcome:

NOTE: There should be one form C for each intended outcome on form B. Intended outcome should be restated in the box immediately below and the intended outcome number entered in the blank spaces.

5. Student shall demonstrate ability to apply electronic theory while working independently in the design, troubleshooting, and repair of electronic circuits.

First Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Graduate follow-up survey item 6a **(solve problems),** item 6b, **(generate original ideas or products)** from 6 mos graduate survey, *Student Services.* Positive expectation/graduate follow-up survey shows 80% from good to very good. Survey scales from poor to very good (1-5).

Summary of Assessment Data Collected:

Graduates surveyed felt training was adequately use for their job position. Fails/meets/surpasses expectation. Results. **6a,of a 40% response, 50% rated very good, 50% average. 6b, of a 40% response, 50% good, 50% average.**

Use of Results to Improve Instructional Program

Action required is: **Continue monitoring.**

Second Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Employer Follow-up Survey items 3e **(work quantity)** and 3p **(organizational ability)** from 6 mos employer follow-up survey, *Student Services.* Positive expectation/employer follow-up survey shows 80% from good to very good. Survey scales from poor to very good (1-5).

Summary of Assessment Data Collected:

Employers surveyed felt training was adequately useful for the job position. Fails/meets/surpasses expectation. Results No data collected

Use of Results to Improve Instructional Program

Action required is: Will attempt to collect more data next year.

Third Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Graduate follow-up survey item 6i **(think critically and analytically)** from 6 mos graduate survey, *Student Services.* Positive expectation/graduate follow-up survey shows 80% from good to very good. Survey scales from poor to very good (1-5).

Summary of Assessment Data Collected:

Graduates surveyed felt training was adequately useful for their job position. Fails/meets/surpasses expectation. Results: **6i, of a 40% response, 50% rated good, 50% average. average.**

Use of Results to Improve Instructional Program

Action required is: **Continue monitoring.**

Summary
Graduates, AAS Degree - Certified Electronics Technician
Spring 2005

Student	Certification & #	Employment,	Location
#1	AC10270	Telecom, MSC	Grand Junction
#2	AC10305		
#3	AC10271	ACS Telcom	Grand Junction
#4	AC10273		
#5	AC10269		
#6	AC10268	Cont - BAT student	MSC, GJ

Other certified, (undergraduate students)

#7	AC103272	Cont - CET student	MSC, GJ

Number of Graduates & Employment Information

Six students graduated with an electronics degree with one unable to complete because of family issues and has returned to complete this year.

Capstone

The capstone consisted of a combined design project including students from all three paths. The project required designing a computer controlled home electronic entertainment and security system. Industry representatives were invited to a show and tell meeting where they shared constructive critisism.
The project required a tream effort in researching modern control methods inccluding; networking, electronic control through the home electrical system, security access, and project management.

Comments

Another show of outstanding measure of student success are the results of two of our students competing at the National Skills Contests in "Computer Maintenance& Repair" and "Internetworking" competitions.
One student placed 12th out of 24 competitors in our first internetworking challenge at nationals.
Another student placed 4th in computer maintenance & repair and also gained A+ certification at nationals.

Assessment Record for
Department
of
Technology Integration

Assessment Period: 2004 2005
Date Submitted: Oct-05

Includes Assessment reports for those
Instructional Programs listed below:

Title of Instructional Degree Program	Degree Level
Telecommunications Engineer	**Associate of Applied Science AAS**

Submitted by: **John Sluder, Dept Head/Instructor**

Mesa State College
Assessment Report

Degree Program: **Telecommunications Engineer**

Assessment Period Covered: 2004 to 2005
Date Submitted:

Expanded Statement of Institutional Purpose Linkage:

Mission Statement of School of Applied Technology:

Mesa State College shall maintain a community college role and mission, including vocational and technical programs. The college offers programs of value in areas of civic and cultural life, research, and recreation and desires to play a constructive role in the improving the quality of human life and the environment. In order to implement this philosophy, the College shall offer vocational technical programs leading to certificates and associate degrees; and continuing education programs directed toward personal, civic, vocational, and professional self-improvement.

School of Applied Technology Goals supported:

To meet the individual needs of each student, whether it be an employee retraining for new skills, a returning student, or a new student seeking career guidance. Each shall receive the specific training necessary so that they may achieve their personal goals.

Intended Education (Student) Outcomes:

1. Student shall be able to perform tasks of entry level telecommunications employment.

2. Student will demonstrate an understanding of personal work characteristics that contribute to effective job performance.

3. Student shall demonstrate effective use of communication skills appropriate to technical specialty.

4. Student shall demonstrate ability to solve telecommunications problems while working independently.

6. Summary Sheet

Mesa State College
Assessment Report

Degree Program: Telecommunications Er

Assessment Period Covered: 2004 to
Date Submitted: Oct-05

Intended Educational (Student) Outcome:

NOTE: There should be one form C for each intended outcome on form B. Intended outcome should be restated i immediately below and the intended outcome number entered in the blank spaces.

1. Student shall demonstrate knowledge to perform tasks of entry level telecommunicatio employment.

First Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Employer survey: Employer satisfaction with graduates ability to do their job properly. Responses to questions 3a **knowledge)** and 3d **(quality of work),** *Student Services.* Positive expectation/employer satisfaction shows 80% fr very good. Survey scales from poor to very good (1-5).

Summary of Assessment Data Collected:

Employers felt that graduates were able to perform quality of work. Fails/meets/surpasses expectation. Results

No data available

Use of Results to Improve Instructional Program

Action required is: **Continue survey**

Second Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:

Networking Plus Certification Exam, N+, *(Sylvan Prometric), positive expectation 80% pass rate.*
CCNA basic certification Exam *(Sylvan Prometric), positive expectation 80% pass rate.*

Summary of Assessment Data Collected:

Results ___%

Use of Results to Improve Instructional Program

Action required is: _____

Mesa State College
Assessment Report

Degree Program: **Telecommunications Engineer**

Assessment Period Covered: 2004 to 2005
Date Submitted: _____

Intended Educational (Student) Outcome:

NOTE: There should be one form C for each intended outcome on form B. Intended outcome should be restated in the box immediately below and the intended outcome number entered in the blank spaces.

2. Student will demonstrate an understanding of personal work characteristics that contribute to effective job performance.

First Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:
Graduate follow-up survey items 6a **(solve problems)**, 6j **(work with others)**, and 6k **(follow directions)** from 6 mos graduate survey, *Student Services.* Positive expectation/graduate follow-up survey shows 80% from good to very good. Survey scales from poor

Summary of Assessment Data Collected:
Graduates surveyed felt training was adequately useful for their job position. Fails/meets/surpasses expectation.
Results: **6a), of 20% responders, 100% reported Very Good.**

Use of Results to Improve Instructional Program
Action required is: **Meets expectation, Continue measures.**

Second Means of Assessment for Outcome Identified Above:

Means of Program Assessment and Criteria for Success:
Employer survey: Employer satisfaction with graduates ability to do their job properly. Responses to questions 3h **(follow instructions)** and 3g **(relationship with others)**, *Student Services.* Positive expectation/employer satisfaction shows 80% from good to

Summary of Assessment Data Collected:
Employers surveyed felt training was adequately useful for the job position. Fails/meets/surpasses expectation.
Results: No data available

Use of Results to Improve Instructional Program
Action required is: **Continue survey**

External Program Review

Mesa State College
(Western Colorado Community College)

Technology Integration

Prepared by:

Donna J. Wishon

A. Program History and Overview

Located in Grand Junction, Colorado, Western Colorado Community College (WCCC), a branch of Mesa State College, offers a Technology Integration Program. At the Tilman M. Bishop Campus of WCCC, formerly known as the Tilman M. Bishop Unified Technical Education Campus (UTEC), technical education programs for college students and area high school juniors and seniors are provided. Most of the high school students are attending Mesa County Valley School District 51 high schools. These area high school students take technical courses as electives at the college while they complete their general academics at their respective high school campuses. These students can earn college credit while attending these classes. The district provides bus transportation for these students.

A portion of the Technology Integration Program has been offered at the college for over thirty years. The current structure was established and implemented in the 1990's in response to the industrial needs. The structure and curriculum have been updated to reflect the current needs of the industry in this region with the advice and support of an active Business Advisory Committee to ensure the technical skills necessary for the graduates are obtained.

The Technology Integration Program includes three distinct technical areas:

- Certified Electronics Technician
- Network Technician
- Telecommunications Engineering

The program offers Technical Certificates in four areas of concentration:

- Technology Integration – Certified Electronics Technician
- Technology Integration – A+/N+ CCNA
- Technology Integration – VoIP Technician
- Technology Integration – Process Maintenance Technician (Beginning Fall 2008)

The program offers Associate of Applied Science degrees in three areas of concentration:

- Technology Integration – Certified Electronics Technician
- Technology Integration – Network Technician
- Technology Integration – Telecommunications Engineering

Students could also elect to earn an Associate of Science degree with an Electronic Engineering Emphasis.

The Technology Integration Program provides core courses all students complete. The curriculum is divided into the various areas of studies, and then the students are brought back together in the capstone course. This arrangement allows the students to work together in teams as they will in the workforce, as well as obtain a more realistic understanding for the systems of technology.

B. Program goals and objectives, and its relationship to the role and mission of Mesa State College.

Mesa State College's mission, established by the Colorado Legislature, is contained in Colorado Revised Statutes (C.R.S.) 23-53-101: (as posted on the website and listed in the catalog)

> "There is hereby established a College at Grand Junction, Colorado, to be known as Mesa State College, which shall be a general baccalaureate and specialized graduate institution with moderately selective admissions. Mesa State College shall offer liberal arts and sciences programs and a limited number of professional, technical, and graduate programs. 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:

- Provide the students with the skills and knowledge to be productive citizens and excel in their chosen fields.
- Work with business and industry stakeholders to continually enhance the quality and timeliness of technical content.

Program Objectives:

- Demonstrate an understanding and appreciation of the liberal arts including the humanities, social sciences, mathematical and natural sciences,
- Practice a commitment to student learning and achievement, including, but not limited to applying basic through advanced technology theory, demonstrating hands-on skills, problem solving techniques, using multiple strategies,
- Demonstrate subject matter knowledge and pedagogy, including, but not limited to creating effective learning environments, practicing teaching both as a science, and providing contextual learning activities,
- Manage and monitor student learning, based upon best practice including, but not limited to using a variety of teaching methodologies, involving support personnel, parents and community members to maximize student success, following ethical responsibilities of teaching,
- Organize teaching practices and learn from experiences including, but not limited to using current research to improve practice, accept teaching as a lifelong learning process, interact with various education personnel and professional associations,
- Participate in learning communities, including, but not limited to using the community to enhance programs, interact with parents and business and industry to maximize learning, participate in local, state, and national professional associations,

- Use technology and concepts to enhance learning and personal/professional productivity including, but not limited to implementing curriculum that includes technology-enhanced methods and strategies, applying technology to a variety of assessment and evaluation strategies, applying technology to a variety of assessment and evaluation strategies; and,
- Mesa State College values teaching, learning, and student-faculty interaction. This program provides the students with expanded opportunities to participate in research and active hands-on learning as supplement to the classroom. Mesa State College is dedicated to assisting students in achieving their goals and dreams.

The program goals and objectives align with and support the mission of Mesa State College as established by the Colorado Legislators.

C. Analysis of need for the program based upon:

To complete the analysis of the need for the program, information was reviewed from the chart below, information from the Colorado Commission on Higher education, the website at: http://highered.colorado.gov/Reports/QIS/2004/index.html, U.S Department of Labor – Bureau of Labor Statistics website at http://www.bls.gov/, the Colorado Department of Labor at http://www.coworkforce.com/, U.S. Department of Labor website at http://www.dol.gov/, the Grand Junction Daily Sentinel on December 7, 2006, US Department of Education at http://www.ed.gov/index.jhtml, and the website, http://www.monster.com, Think Energy Group Engineering Staffing Company at http://thinkenergygroup.com, and Union Pacific Railroad employment website at http://www.unionpacific.jobs/.

i. Enrollment, graduation rates, and other relevant data.

This Table is from Self Study on Technology Integration, Appendix i :

	Fall 2001*	Fall 2002*	Spring 2003	Fall 2003	Spring 2004	Fall 2004	Spring 2005	Fall 2005	Spring 2006
Enrollment	52	47	42	33	35	32	32	26	27
Graduation	16	11	10		6		12		10

*Not divided between Fall and Spring

Enrollment rates in this program have been declining in recent years. This follows the trend in the state of Colorado and the national trends for this field of study. The students currently registered are predominately part-time, nontraditional students who are registered for more than two years to complete their degree.

The actual retention rate for this program could not be calculated due to insufficient data. Retention is vital to all colleges, universities, and technical programs. There are many reasons students do not complete their chosen field of study. These reasons range from

personal problems, financial difficulties, insufficient personal support for completion, schedule conflicts with personal life and classroom offerings, etc.

The demand for graduates trained in the three specializations should grow at an average or higher than average rate throughout the nation, including the state of Colorado. The need for network/telecommunications technicians/analysists, and process systems control technicians are expected to grow at a "much higher rate than average rate" as per the Department of Labor Bureau of Statistics, while the industrial side of electronic technicians should grow at an average rate through 2014.

ii. Other Considerations.

The Technology Integration Program uses the Business Advisory Committee effectively and has revised the curriculum to maintain and include the skills necessary for graduates to be productive upon graduation and entering the workforce. The incorporation of hands – on skills gives the students an advantage when they enter the workforce. Also, the faculty all have field experience in their areas of expertise, which they relate to the students through real-world types of projects.

The applications of math and science are extremely important to this area of study. According to the U.S. Department of Education, the national average for the math scores from graduating high school students has declined in recent years. This program has faculty that are fluent in math and has incorporated a math course to support the use of math in this area of study.

Some of the faculty members also provide support for other disciplines for the college. With the lower enrollment, these faculty members have been able to teach in other disciplines and support areas, such as Electric Lineman, Computer Information Systems Business, and Mathematics. This helps with the FTE as well as providing an opportunity for the faculty to stay current with their skills in these areas.

Professional development should be implemented in the technical areas, such as training in Programmable Logic Controllers (PLCs) to support the changes in technology and the increased demand in this area. There should also be a continuation and strengthening of involvement with professional organizations in these areas of expertise, including not only the staff and faculty, but the technology students as well.

Local industry strongly supports this program. Industry involvement includes equipment donations, student placement, advisement, and general involvement with real-world learning projects. Members of industry are involved in the planning, training, and providing educational experiences for the students. Industry helps determine the priority for the resources necessary for the program.

D. Narrative Summaries of Resources.

i. Unique characteristics of the program influencing the need for resources.

The Technology Integration Program includes multiple disciplines of technical study. These areas of studies are based on technician skills, rather than the engineering level. All of these areas have common needs for equipment, while each has a requirement for equipment unique to that area of study. Most of the equipment in these disciplines can be very expensive yet very necessary to offer the required training in each area. Some of the equipment also requires a room dedicated to its use. Due to the size, type and stability of most of this equipment, it cannot be easily dismantled and moved at the end of a class.

The need to continue the core courses, including the electronic fundamentals, is vital to all disciplines. All disciplines require the electronic fundamentals. The involvement of postsecondary students with the secondary students provides the transitional link from secondary to postsecondary curriculum. It can also instill the importance of a professional attitude and provide the networking required for the workforce.

In most industrial environments, individual disciplines are required to work side by side as team members. Therefore, the continuation of the joint capstone course proves vital to the program. It provides a time when these students can utilize their acquired skills in a joint venture while learning new ones. The interdisciplinary networking provided by this course has proven valuable.

ii. Faculty and staff.

Since the Technology Integration Program includes multiple disciplines, the faculty and staff must also possess multiple skills. Faculty must possess strong technical skills and have excellent presentation methodologies to deliver this type of instruction. Professional development is a continual process, especially in the technical area. With the rapid, continual changes in technology faculty must also continue to grow.

The current faculty in the Technology Integration Program consists of four members with all four classified as full-time employees. The program dedicates almost exclusively one full-time faculty member to the secondary level classes. One faculty member teaches part-time in the Technology Integrated Program, and part-time in other disciplines, including Computer Information Systems Business, and Mathematics. Two of the full-time faculty members are dedicated exclusively to the Technology Integration Program, with one of these listed as the Lead Instructor.

Two of the faculty members have completed Master of Science degrees and two have completed Colorado Vocational Teaching Credentials and Licenses. All four of the faculty members are certified instructors in the various technical areas as required by industry to teach their curriculum. Most higher educational accreditations agencies require faculty members possess a degree equal to or greater than the subject matter degree being taught; however, until recent years, this technology had very few locations where an associate degree could be obtained. There are still only a small number of

colleges offering degrees in this discipline, even though the technology has evolved to this level.

Most higher educational accreditations agencies require the faculty members to possess a minimum number of years in the workforce performing these skills, generally a minimum of three to five years. All of the faculty members possess at least ten years or more of related field experience.

iii. Physical facilities.

The Technology Integration Program, located at the Western Colorado Community College, currently comprises three classrooms/laboratory facilities. The prioritizing of resources, including physical facilities, presents a challenge for a program with multiple disciplines.

One laboratory can accommodate up to three to four classes simultaneously. The open lab space has high ceiling that can house the larger equipment necessary to teach in this discipline. Classes form groups within the open lab area. The openness of the space, the sound of the running equipment, and the number of simultaneous classes does contribute to a high background noise environment.

The second large laboratory houses a classroom suitable for lectures. There are offices for the faculty located inside the laboratory, which makes this convenient for students to locate the faculty.

The third classroom, located in the annex building on the same campus, provides a suitable environment for lectures and computer laboratories. The lead instructor's office is located adjacent to this classroom. This location provides the privacy required for this position while allowing easy access for students, administration, other faculty, and others as needed.

iv. Instructional Equipment, including information technology and its use.

As a multi-discipline technology program, the Technology Integration Program utilizes a large variety of equipment ranging in quantity and size. Certain pieces of equipment are common to all areas such as the basic electronic equipment. The program has a sufficient quantity of basic electronic equipment to offer this portion of the curriculum as well as covering the needs for the secondary level course work.

However, distinct equipment needs exist for each area of instruction. These needs vary in the amount of space required due to the size and the quantity of pieces required to teach effectively to a class of reasonable size. Equipment is located in the laboratory and is currently in use by the program; however, more equipment is needed. Computers for the classroom are also needed for use in the laboratories to interface with some of the laboratory equipment as well as use to complete computer laboratory exercises.

The industry has donated some equipment while other equipment has been purchased by the program. The equipment currently in use is good quality equipment. The need for more equipment in the advance laboratories is still evident. The procurement of new equipment should be a continuous process. The faculty has done an outstanding job of updating and utilizing all equipment currently available for use.

v. Library, including DVD, video, etc.

The library, located at the main campus across town, has staff supportive of the campus and work well with the program and the students. The library provides good reference material to support the core courses for the Technology Integration Program. Although a computer laboratory dedicated to student use exists at the library, its location does not allow easy access for students taking classes at the WCCC campus. The library has extended hours to accommodate all students for Mesa State College.

vi. Unique sources of revenue and expenditures.

The Technology Integration Program has obtained a National Science Foundation (NSF) Grant due to its ability to incorporate technology in the classroom for hands – on training. Normally NSF Grants are very specific in the use of these funds.

Industrial partnerships and training provides another source of revenue that should be considered. Many organizations use technical programs to help train new employees and/or update the skills for current employees. This training may be completed on site at organization's site or on campus.

Colleges and universities should not compete in the industrial environment; however, opportunities may exist to help support some companies and organizations by completing projects for donations or a reduced rate. This allows companies to get temporary help for major projects while allowing students to obtain experience in the actual field environment. This option should only be completed under the direction of the company and the instructor of record. The class objectives should be considered to determine if the exercise will sufficiently cover these learning requirements.

E. Effectiveness:

i. Accreditations by professional, regional, or national associations.

Accreditations are vital in the technical arena. The following organizations have certified the Technology Integration Program and its faculty:

Certified Curriculum – Electronics Technicians Association (ETA)
Local Cisco academy, Accredited by CISCO
Process Systems Technology proposed curriculum, certified by CAPT

ii. Changes since the most recent program review.

The curriculum has been updated to combine the Network Technician option and the Telecommunications Engineer option to form one option titled Network/Telecommunications Technician AAS. This change was implemented due to industry request with the changes in technology. A proposed Process Systems Technology AAS curriculum should go into effect for the 2007-2008 school calendar. This curriculum addition was implemented per request from oil and processing industry in the local area. The mathematics used to support the program has also been customized to support the needs of industry and student success rate. The program worked closely with the mathematics department to help develop and implement this course. The Applied Physics course was also updated and customized to enhance the curriculum relevance to the program.

iii. Faculty success data

(1) Teaching:

The students have great respect for the faculty members in the Technology Integration Program. An outstanding rapport exists between the students and faculty. The extensive field experience the faculty brings to the classroom has given the students an advantage in the classroom and in the obtainment of positions in the workplace upon graduation. The teaching skills demonstrated in the classroom show a firm, but fair teaching style going above and beyond what is required. The students worked together in support of each other while completing their assignments independently as needed. The presentations completed by the class were professionally developed and delivered by the first semester students. The faculty implements various methodologies to ensure all students receive information via various presentation methods to assist all learning styles.

(2) Advising:

The faculty advises the program students. This includes the secondary and postsecondary students regarding their coursework. If the student has a personal issue, the faculty will advise the student to the appropriate department on campus to ensure the student receives the advise and support necessary to successfully complete his/her education.

(3) Scholarship:

The scholarships specifically designated for this program are:

Mesa State College Academic (Colorado) Scholarship-WCCC
Red "Kiwanis" Crawford Scholarship

Several non-program specific scholarships available include:

American Business Women Association (ABWA) WCCC Scholarship
AAUW - Mary Rait, Mary Jewell Willsea Grant – WCCC
Brownson Memorial Leadership Scholarship-WCCC
City of Grand Junction Scholarship
R. B. C. Dain Rauscher Scholarship
Bruce and Louise Dixson Scholarship
David M. Gardner "WCCC" Scholarship
Goffredi Memorial Scholarship

Grand Junction Lions Club Scholarship – WCCC
Roth Greer Lapham Scholarship-WCCC
Junior Service League WCCC Scholarship
Mattie Smith Wagler Scholarship
S. N. Wagler Scholarship

(4) Service:

The faculty serves in the following activities and groups:

Advising Committee
Advisory committee Career Center
Faculty Senate
Information Technology support
Job Corp, RMPBS MSC service
Skills USA

(5) Other:

The Technology Integration Program has received a National Science Foundation (NSF) Grant and they have earned Industry Association Work – Special Recognition.

iv. Student success data.

The following lists the awards and industrial certificates received by the Technology Integration Program students:

Awards:
2005 – State Skills Olympics Internetworking: Gold Medal
State Skills Olympics Computer Servicing: Gold Medal
National Skills Olympics Internetworking: 12th Place
National Skills Olympics Computer Servicing: 4th Place
2006 – State Skills Olympics Internetworking: Bronze Medal

Certificates:
2005 – 2 Earned CCNA CISCO Certifications
7 Earned Electronic Technicians Association Certified Electronic Technician (ETA CET) Associate Level
2 Earned A+ Certifications
2006 – 2 Earned Electronic Technicians Association Certified Electronic Technician (ETA CET) Associate Level

One student continued on to earn his (her) BAS, while four students are currently continuing their studies for their BAS.

According to the graduate survey, from a total of fourteen (14) graduates, seventy one percent (71%) of graduates state the Technology Integration Program has provided job opportunity and forty eight percent (48%) of these students state it has also provided job advancement. Fourteen percent (14%) of this pool of graduates state the program

provided job support and seven percent (7%) stated it provided other. Over one hundred percent (107%) of this pool is employed, with seven percent (7%) showing as being self employed. Sixty four percent (64%) state their current job is related to their training, with twenty one percent (21%) stating their current position is closely related. All of the survey pool is currently employed full time. Thirty six percent (36%) of this survey pool plan to continue their education.

F. Strengths identified by the review.

Eight significant strengths are identified by the review. These eight are the faculty members, hands-on training, administrative support, college library, industrial support, the curriculum structure, co-habitation of secondary and postsecondary classes, and resource utilization.

The faculty members are the top strength identified. The instructional staff shows the dedication necessary to maintain a strong industrial commitment and the respect of the students and graduates from the program. The industrial experience possessed by the faculty is vital to continue to maintain the high standards in the graduate knowledge. The faculty members advise students academically and assist with job placement. The faculty members are able to identify with industry and student needs.

The largest percentage of current students and graduates surveyed feel the faculty members are knowledgeable in the field. The faculty members also relate well to the students in the program. The students respect the faculty and feel the instructors are sincerely interested in them as individuals and in their future. The students also feel they received a very good quality of instruction. The faculty members are able to incorporate the knowledge from theory into hands-on skills that allow the graduates a strong working knowledge of their chosen field. Several of the faculty members are also able to teach in other disciplines making them versatile.

The "hands – on" training is the second significant strength identified. The students have the ability to apply the skills they are learning in theory for their chosen fields. They are given assignments to strengthen their personal skills and knowledge, and are also given assignments to strengthen their teamwork skills. Students are also given team assignments simulating real industry assignments that allow each student individual work and team work. These skills prove very important once the student graduates and become employed in the industry.

The commitment from the administration, recognized as the third significant strength, allows the program to grow, be versatile and stay up to date with the technology changes. The Technology Integration Program has been able to update the curriculum to maintain their high standards. This administrative support allows the program to continue providing the skills necessary for graduates to possess to be eligible for employment in their chosen field of study. A program cannot survive without this strong commitment from the administration.

The college library, recognized as the fourth significant strength, has staff supportive of the campus and works well with the program and the students. Library support appears adequate and provides good reference material to support the core courses for the Technology Integration Program. The library contains a computer laboratory extensively used by many students from both campus locations. However, all of the Technology Integration classes are held at the WCCC campus across town from the library, library access proves difficult between classes. It does, however, provide extended hours to accommodate all students in every discipline, including the Technology Integration Program. A knowledgeable, friendly, and very helpful staff contributes to the library's strengths.

Industry support noted as the fifth significant strength in this review can be demonstrated by their involvement and strong support of this program, including equipment donations, student placement, advisement, and general involvement with real-world learning projects. Members of industry are involved in the planning, training and educational experiences for the students. Industry helps determine the priority for the resources necessary for the program. Industry also donates relevant equipment to their respective areas of study.

The Technology Integration Program uses the Business Advisory Committee effectively and has revised the curriculum to maintain and include the skills necessary for graduates to possess to be productive upon graduation and entering the workforce. The incorporation of hands – on skills gives the students an advantage when they enter the workforce. The Business Advisory Committee meets regularly, hires graduates, and gives donations to the program. Some of these donations are in the form of equipment the program would not be able to purchase due to the cost.

The curriculum structure, noted as the sixth significant strength, provides the independent study and the team concept for all Technology Integration Program students. The structure brings students together at the beginning of their training by the use of core courses, separating these students into their major course studies and then pulling the students back together in a capstone course. This helps students to form bonds and networking that will be useful even after they graduate.

The seventh significant strength recognized in this review recognizes the offering of technical courses to area high schools in the same environment as the college students. The unique agreement between Mesa County Valley School District 51 school district and Western Colorado Community College (Mesa State College) should be continued with emphasis on the students enrolled continuing their education in postsecondary coursework. This agreement allows the utilization of resources to be shared. It also offers an excellent recruiting pool of prospective students, not just limited to this program, but for the entire college. This arrangement also allows the faculty and staff to begin and foster relationships with high school students early.

Effective use of resources to hold program costs at a minimum defines the eighth significant strength of the program. Not only does the program share equipment with the high school courses and courses common to all disciplines in the core, it also uses

donated equipment still vital to industry. This allows funds to be directed to other needs that cannot be met with donations from industry.

G. Areas needing strengthening identified by the review.

There are four key areas identified by this review as needing strengthening. These areas include: the recruitment and retention of students; resources including physical facilities, and equipment; professional development; and program funding.

The first area in need of strengthening focuses on the recruitment and retention of students. Although a great need for graduates from this program exists in industry, enrollment rates in this program have been declining in recent years. This follows the trend in the state of Colorado and the national trends for this field of study. The need for graduates trained in the three specializations offered is expected to grow at an average or higher than average need throughout the nation, including the state of Colorado. The need for network/telecommunications technicians/analysists, and process systems control technicians is expected to grow at a "much higher rate than average rate" as per the Department of Labor Bureau of Statistics, while the industrial side of electronic technicians should grow at an average rate through 2014.

Resources, the second area in need of strengthening, include physical facilities and equipment needs. As a multi-discipline technology program, the Technology Integration Program uses a large variety of equipment ranging in size and quantity. Certain pieces of equipment are common to all areas, such as the basic electronic equipment. The program has a sufficient quantity of basic electronic equipment to offer this portion of the curriculum as well as covering the needs for the secondary level course work.

However, there are also distinct needs for each area of instruction when it comes to equipment needs. These needs vary in the amount of space required due to the size and the quantity of pieces required to teach effectively to a class of reasonable size. Most of the equipment used in this program is very expensive to purchase and in some cases to operate and maintain. Computers for the classroom are also necessary to satisfy the requirement to interface with some of the laboratory equipment as well as use to complete computer laboratory exercises.

The current use of the large laboratory for simultaneous classes can be difficult. The large main laboratory carries noise throughout the room. There are currently banners hung from the ceiling that aids in the baffling of some of the noise while helping to advertise the program. Some of the equipment also requires room to setup and utilize. Due to the size, type and stability of most of this equipment, it cannot be easily dismantled and moved at the end of a class. This laboratory is an excellent area to implement this equipment.

The third area in need of strengthening, professional development of faculty, should be implemented in the technical areas, such as training in Programmable Logic Controllers (PLCs), etc., to support the changes in technology and the increased demand in this area. The fostering of the relationship between the program and professional industries was

also noted. A continuation and strengthening of involvement with professional organizations in these areas of expertise, including not only the staff and faculty, but the technology students as well, is needed.

Funding, the fourth area in need of strengthening, proves the most vital link to providing the opportunity for recruiting, equipment acquisition, and professional development.

H. Vision.

i. Proposals for strengthening the program.

The proposal for strengthening the program would be to develop and implement a strategic plan including, but not limited to, the key areas to strengthen. These key areas are recruitment and retention, financial planning, equipment and other resource acquisition, and professional development.

The enrollment is a critical issue. Enrollment rates in the Technology Integration Program have been declining in recent years. This follows the trend in the state of Colorado, and the national trends for this field of study, although there is a great need for these graduates. The need for graduates trained in the program's specializations offered is expected to grow at an average or higher than average need throughout the nation, including in the state of Colorado. Also, the need for network/telecommunications technicians/analysists, and process systems control technicians are expected to grow at a "much higher rate than average rate" as per the Department of Labor Bureau of Statistics, while the industrial side of electronic technicians should grow at an average rate through 2014.

A recruitment plan needs to be devised and implemented for this program. This recruitment plan should involve the program faculty and staff in the devising, implementing, and participating in the recruiting activities. The recruitment should be a daily part of all personnel involved with this program. The faculty, staff, students, and successful graduates are the best recruiting resources available and should be utilized as much as possible. Suggestions include having faculty, staff, students, and graduates participate in recruiting activities, including but not limited to college and career days. The program could host, co-host, or provide support too many community involved activities.

A possibility might exist to merge some of the high school courses with some of the introductory courses offered to matriculated college students. This would allow the networking to occur earlier for area high schools taking courses on this site. This can help motivate high school students to complete their secondary education and continue on to earn their associate degree. The joining of these students can also provide a conduit for mentoring for both sets of students.

Night courses or short summer courses could also be used to help boost enrollment and retention. This opens up the number of prospective students to include those that work during the day, and need to be able to obtain their degree in the evening as well as a more flexible schedule giving even current students the ability to work as needed while still

continuing their education. The students currently registered are predominately part-time, nontraditional students, which are registered for more than two years to complete their degree.

The second key area for proposed changes deals with funding. A financial plan should be devised and implemented. Most programs rely on a budget given to them from the college; however, there are ways to subsidize these funds to allow the Technology Integration Program to thrive.

One method to increase funding sources includes securing of grant funds. The Technology Integration Program has obtained one National Science Foundation (NSF) Grant due to their ability to incorporate technology in the classroom for hands-on training. Normally NSF Grants are very specific in the use of funds; however, grants can be written to cover the equipment needs. The obtainment of grants from NSF or other sources should be a priority.

Other sources of revenue that should be considered include industrial partnerships and training. Many organizations utilize technical programs to help train new employees and/or update the skills for current employees. This training may be completed on site at the company's location or on campus. The industrial training venture provides funds and allows instructors to work with industry to obtain the concept of skills required by industry. The program can contract these services to industry to include, but not limited to, devising prospective employee examinations, written and/or laboratory, for companies wishing to test prospective employees to insure the skills sets are possessed. The training of new employees can be contracted out by the program to complete for organizations as it relates to the technical area.

Colleges and universities should not compete in the industrial environment; however, there are opportunities to help support companies and organizations in providing assistance on projects for donations or a reduced rate. This allows companies access to temporary assistance in completing major projects while allowing students to obtain experience in the actual field environment. This option should only be completed under the direction of the company and the instructor of record. The class objectives should be considered to determine if the exercise will sufficiently cover these learning requirements.

A professional development plan should be devised, implemented, and maintained. This is a method to provide planning and the ability to list priorities for the faculty and administration. This would provide a plan for funding procurement and release time as required to participate in training, industrial seminars, trade shows, and conferences. Time and funding are important assets that must be planned. This is one of the priority items since technology changes constantly. The faculty must know exactly what type of equipment and instruction is required for a classroom.

An acquisition plan for purchasing, maintaining, and replacing resources needs to be devised and implemented. The priorities must include all resources necessary to continue the high quality education currently offered at this college, while planning for the future

needs of the program. The placement of large equipment must also be considered when planning for the acquisition of equipment. Physical facilities are required to accommodate the equipment; therefore, these resources must be part of the acquisition plan.

ii. Program priorities requiring additional resources.

The priorities requiring additional resources in order of importance are:

1) Recruiting and retention activities,
2) Professional development,
3) Equipment needs,
4) Physical facility requirements.