TMCC
Truckee Meadows Community College

APPLIED INDUSTRIAL TECHNOLOGIES DEPARTMENT

Architecture

Program Review
2008-2009

Submitted November 2008

Applied Industrial Technology

Truckee Meadows Community College
Program Review

Program Reviewed: Architecture

Division: Math, Science, Engineering, Technology

Year of Review: 2008-2009

Self-Study Committee Members:

Ellis Antunez– Professor, Architecture, Landscape Architecture
Dan Bouweraerts – Professor, Graphic Communications
Dale Carlon – Golf Course Management Advisory Committee, Rail City Nursery
Nate Hudson – Student, Architecture
Mark Johnson – Architecture Advisory Committee, Hershnow, Klippenstein Architects
Amber Ka'ai'ai – Classified, Construction Technologies and Architecture
Ric Licata – Professor, Architecture, Architectural Design Technology
Barbara Rummer – Classified, Manufacturing Technologies

Committee Chair: Jim New – Associate Dean, Applied Industrial Technologies

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Date Submitted to Program Review and Development Committee: 11/03/2008

Recommended Year for Next Self Study: As regularly scheduled

Summary Recommendation:

The associated disciplines of TMCC's Architecture program provide a wide variety of training opportunities for a diversity of students. Two AA degrees provide seamless transfer to baccalaureate programs at UNLV, while two AAS degrees and two certificates prepare students for immediate employment in the architecture, landscape architecture, and design industries. The programs are unique in their focus on community service and sustainability, which generates significant publicity and goodwill throughout the region.

The programs adhere to standards established by the National Architectural Accreditation Board and the Landscape Architecture Accreditation Board. Inadequate studio facilities, however, make it impossible for the college to meet the NAAB requirements for design studio experience.

The programs recently revised inaccurate and redundant prerequisites in many of its courses, but now must revise its degrees and certificates to accurately reflect all prerequisites. It must also evaluate the necessity of each of its degrees as it prepares to introduce a new Associate of Science in Horticulture and an Associate of Applied Science emphasis in Residential Design.

☒ Continue Program/Discipline
☐ Reform Program/Discipline
☐ Delete Program/Discipline

Signatures of Self-Study Committee Members:	Date:
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I. DESCRIPTION

A. Mission Statement:

The TMCC Architecture programs provide high-quality instruction that promotes leadership, vision, social responsibility and sustainability to prepare students for entry level and professional positions, continued and advanced studies, and lifelong learning in Architecture, Landscape Architecture, and Golf Course Management.

Relationship to College Mission Statement:

The associated disciplines of the Architecture programs provide technical, transfer, and general education courses leading to one-year certificates and associate's degrees. The program also offers community and continuing education courses and workshops. The faculty members are dedicated to providing lifelong learning opportunities that help students achieve their goals, aspirations, and dreams. Emphasizing responsible social interaction utilizing the local region as our laboratory, the programs seek to improve the quality of life for our diverse community by emphasizing designs with environmental sustainability.

B. Description of Program:

Primary goals and objectives

The primary goal of the Architecture programs is to prepare a diverse group of students with the necessary skills to begin or enhance their careers in the design and construction industries. The programs integrate academic and technical training and adapt to current industry trends. We also balance traditional and modern technologies and incorporate realistic community-based projects to achieve our goals. The programs also prepare Architecture students for transfer to baccalaureate and professional degrees.

Unique characteristics

The Architecture, Landscape and design programs (herein after referred to as Architecture programs) at TMCC blend traditional methods with current technology. Our classes emphasize creative problem solving in a modern learning environment that uses industry-standard equipment and software.

Using the communities of northern Nevada as learning laboratories, the programs emphasize a commitment to community service and activism while offering diverse, real-world learning experiences. Students gain a comprehensive understanding of theory and practice by emulating professional standards and working with actual clients, typically non-profit or governmental agencies.

The programs emphasize sustainability design reflective of industry trends toward green developments and energy efficient buildings. The training includes an environmental focus in land-use and site development. This is consistent with the goals of the MSET division, TMCC and NSHE to create a more sustainable education system and enhancing professional opportunities in green industries.

The early focus on sustainability and alternative energy sources forms a unique foundation for our programs. Increasingly, renewable energy systems are a fundamental element of the built environments of the future. We investigate these systems on a regional level and underscore the importance of their integration into architectural

designs. The students become familiar with the conceptual aspects of how these systems work and their fundamental necessity

The abilities to accurately present ideas, communicate solutions to problems, and develop leadership skills are instilled in students at an early stage of the programs. This is part of a very deliberate learning process which is repeated through many exercises. The presentation process gives the student an opportunity to apply their graphic and communication skills, and to receive immediate feedback from professionals practicing in the region. Through this process the students develop leadership skills which are further developed in public and community settings.

As a final semester project the students are involved in a real world community based design problem which solidifies their ability to communicate to large groups by requiring them to present design solutions developed in the studio environment. This project instills in the student the continuing need for community involvement in their professional lives. This process also fulfills community needs by providing design service to those who do not have access to such services.

The Golf Course Management program was developed to meet the needs of the region, providing students with knowledge of local conditions that are found within the Reno-Carson City-Lake Tahoe Area. Utilizing professionals from golf courses within the region as instructors, the students are able to gain the knowledge and skills necessary for employment in this field. Internships provided by the local industry prove invaluable to the students, giving them a real world experience in the workplace.

Concerns or trends

Several trends will affect the Architecture programs in the near future, including the growing importance of sustainable designs, the increasing reliance on computer applications, and the mounting complexity of building systems. Other concerns that specifically affect the TMCC programs include our ability to adhere to accreditation standards and the ever-changing regulatory environment.

As energy resources based on fossil fuels become economically and environmentally more costly, sustainable designs have become the most significant trend in the architectural industries today. The TMCC Architecture programs integrate sustainable design concepts throughout the curriculum.

Computer applications have replaced hand graphics, once the cornerstone of the design education. This redirection has created a potential void in the ability of students to communicate without the use of computers and a concern for developing their design skills. The programs at TMCC have emphasized recovering graphic/sketching skills which employers consider to be an enhancement of the students' talents through the hand/mind connection of drawing.

Another concern for the TMCC program is the lack of individual studio spaces for students. Studio culture in architectural education is viewed as the sharing of knowledge and team building among students through the common work and social environment of the design studio. All schools of architecture and the National Architectural Accreditation Board (NAAB) view the studio culture as a strategic part of the design education. This issue is addressed by the following definition from the NAAB: "The accredited degree program must provide the physical resources appropriate for a professional degree

program in architecture, including design studio space for the exclusive use of each student in a studio class; lecture and seminar space to accommodate both didactic and interactive learning; office space for the exclusive use of each full-time faculty member; and related instructional support space. The facilities must also be in compliance with the Americans with Disabilities Act (ADA) and applicable building codes." Unfortunately, the studio culture at TMCC is minimal and fragmented at best due to the lack of dedicated individual studio spaces for students. The deficiency puts TMCC graduates seeking entry to a baccalaureate program at a disadvantage.

Building systems have grown increasingly sophisticated. This trend in the industry has necessitated specialization and expertise and requires students to choose a career direction early in their academic careers. This not only impacts the students' instruction but also their choices of schools for advanced studies since many tend to specialize in a facet of the profession.

Responding to the ever-changing regulatory environment is also a challenge. Students must understand this dynamic environment and learn to navigate the maze of code requirements such as the Americans with Disabilities Act (ADA) and many new model energy codes.

Finally, the lack of design professionals in civic leadership positions has created a knowledge-void in community decision making. This is a national concern, allowing professional politicians to determine the direction of the built environment without the counsel of trained professionals. The TMCC Architecture programs expose our students to community based design processes and we encourage them to become a part of the political dialog where they live.

Significant changes

Design with alternative energy sources and efficiency in mind has significantly altered the design profession. All disciplines in the design industries must consider resource conservation in their decision making process, and so to, must be an integral part of an architectural education.

The programs also strive to implement industry-standard initiatives into the curriculum, such as the American Institute of Architect's (AIA) Integrated Project Delivery (IPD) approach and the Sustainable Sites Initiative of the American Society of Landscape Architects (ASLA). IPD seeks to reduce waste and optimize efficiency through all phases of design, fabrication, and construction through collaboration between architects, owners and general contractors on a given construction project. Meanwhile, the Sustainable Sites Initiative has developed guidelines and standards for landscape sustainability.

Industry-wide cultural diversity has been a challenge. The most notable change in the design industry has been the growing number of women in architecture schools, although the profession is still lagging behind in the ratio of women to men. Minority groups are still under represented in our schools and the profession. There are significant opportunities for minorities in the design fields with the emergence of many cultures throughout our country.

With the introduction of many new materials and construction methods the design industries are experiencing many changes in the way the built environment is

constructed. With these challenges come new opportunities for the way architects design and conduct business.

Degrees and certificates
With two AA degrees, two AAS, and two certificates, the Architecture programs may offer the most diverse set of degrees and certificates in the college. Worksheets for each are provided in Appendix A. These credentials meet the needs of multiple industries at various skill levels.

- Associate of Arts in Architecture
- Associate of Arts in Landscape Architecture
- Associate of Applied Science, Architectural Design Technology
- Associate of Applied Science, Golf Course Management
- Certificate of Achievement, Architectural Design Technology
- Certificate of Achievement, Landscape Management

Besides those listed above, the programs recently gained approval for a new AAS degree in Residential Design and an Associate of Science in Horticulture.

Specific niches
The programs serve the needs of a variety of industries including architectural firms, landscape architecture and planning firms, engineering firms, design/build firms, construction companies and golf courses. The faculty members belong to the American Society of Landscape Architects (ASLA) and American Institute of Architects (AIA). The programs also sponsor an active student chapter of the AIAS and are developing a student chapter of the ASLA.

The TMCC program offers the certified landscape technician exam in cooperation with Nevada Landscape Association. Additionally, several courses offered by the Architecture programs are also required for the bachelor's degree in Interior Design offered by the University of Nevada, Reno.

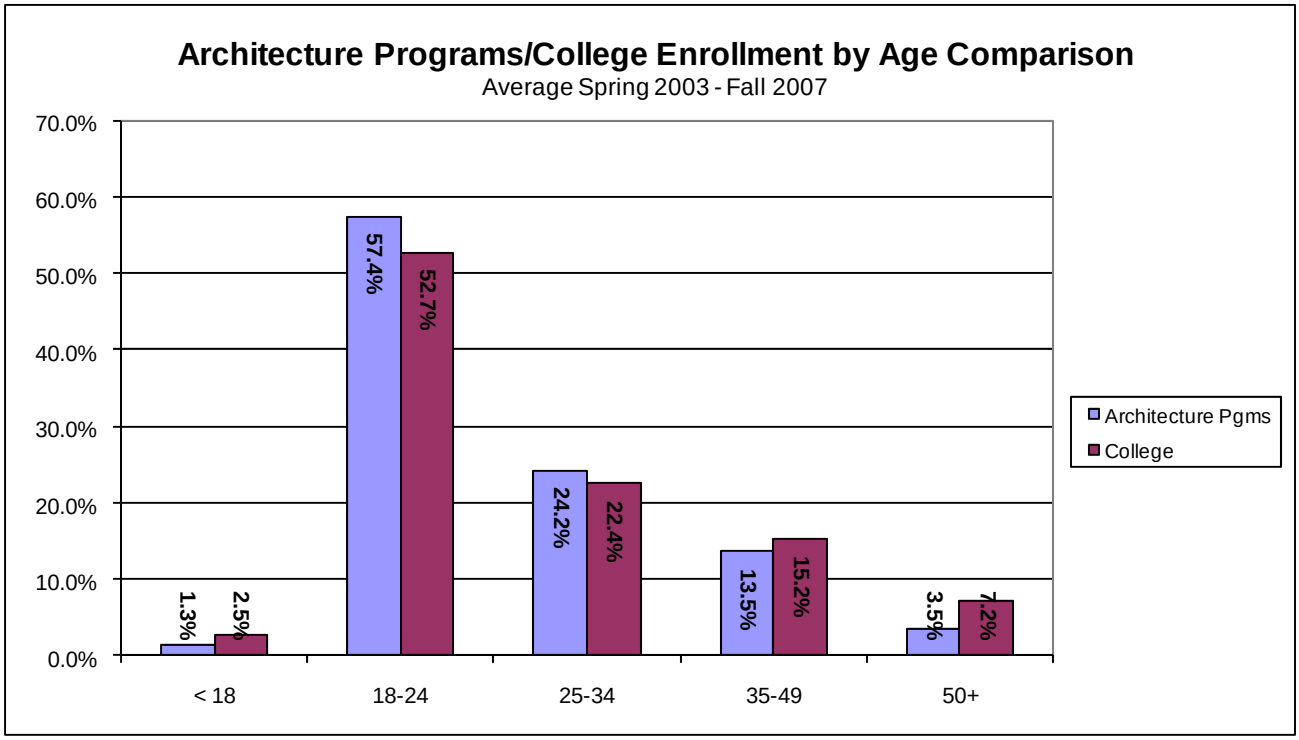
II. DEMOGRAPHICS AND ENROLLMENT

A. Analyze general student demographics (age, gender, ethnicity, in-state vs. out-of-state)

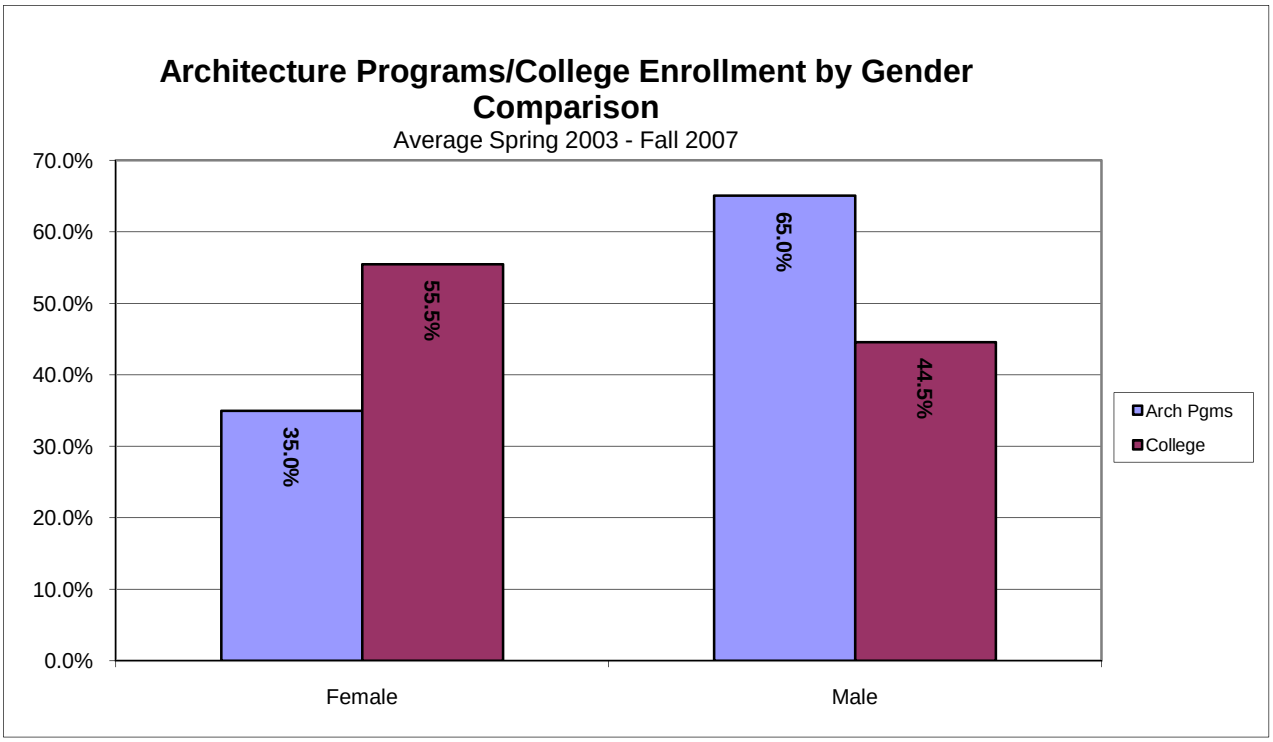
What trends are most notable?
Demographics data from 2003 to 2007 provided by the Office of Institutional Research (Appendix B) reveals that the student population in the Architecture programs consists primarily of white male students of traditional college age. The ethnic makeup and age distribution are consistent with that of the college. Space and equipment availability limit the student to faculty ratio.

Age - As illustrated in the chart below, age distribution in the Architecture programs generally reflects that of the college, with a slightly larger concentration of students in the 18-24 demographic. AAD courses tend to draw a greater number of traditional age college students who are seeking the transfer degree with the goal of continuing to baccalaureate and professional degree programs. This is also bolstered by UNR Interior Design students who are required to take three courses from the TMCC program to fulfill their degree requirements.

The majority of students who have declared a major in one of the Architecture AAS degrees, however, are concentrated in the 25-34 demographic. This age distribution is consistent with the unit's mission to train entry level technicians and transfer students.



Gender - As expected, the Architecture Technologies Unit consists primarily of male students which is consistent with national demographics and reflects its association with the male-dominated construction industry.



A comparison of the Architecture program's gender ratio with the LAAB annual report reveals that TMCC's is similar to the national rate in 2004 (the most recent statistics available).

Table 1: LAAB/TMCC Gender Ratios

Agency	Male	Female
LAAB (2004)	3263 67%	1625 33%
TMCC (Avg)	76 64%	42 36%

Ethnicity - Overall, the Architecture Technologies Unit's ethnic makeup generally resembles the college as a whole and Washoe County. While 73% of the students are white, the Architecture Technologies Unit exceeds the college in the percentage of Hispanic students enrolled. African American and Native American percentages are comparable with the college and community as a whole, but Asian students are under-represented in the programs.
(Source: http://quickfacts.census.gov/qfd/states/32/32031.html)

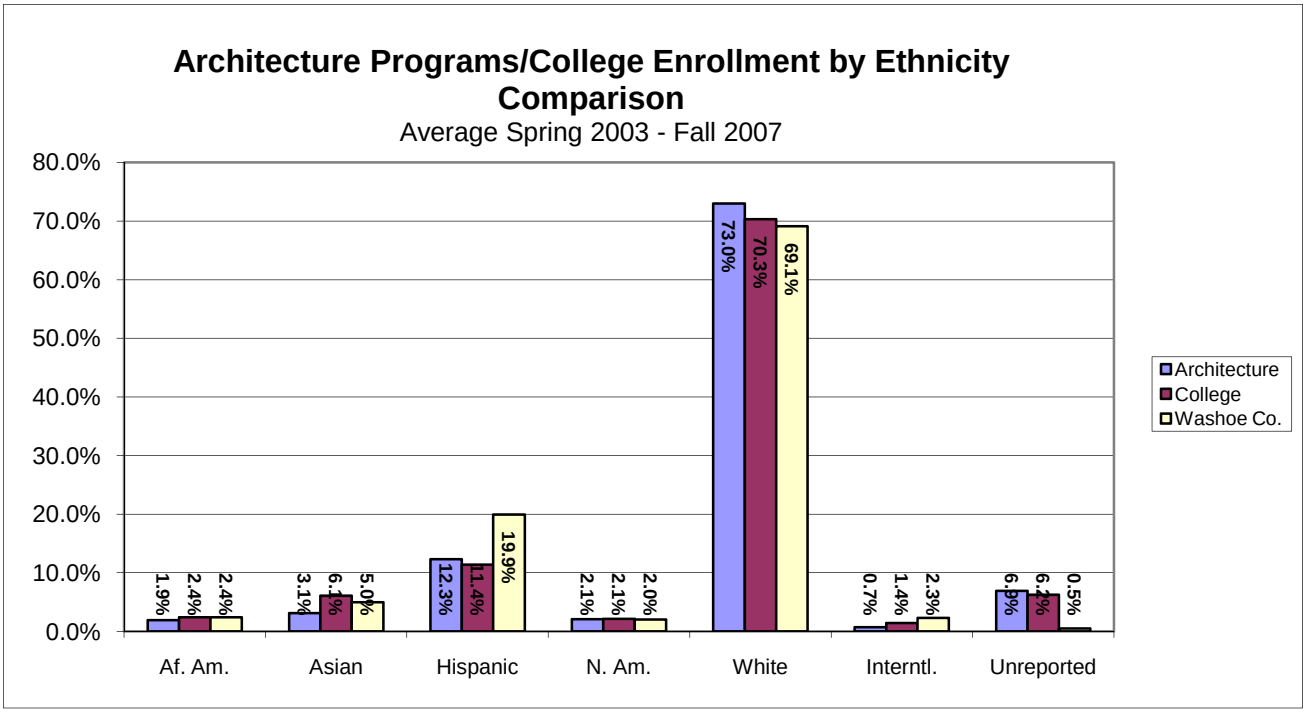


Table 2 below also confirms that the Architecture program's ethnic makeup is generally consistent with national averages, with some regional exceptions, as reported by the LAAB.

Table 2: LAAB/TMCC Student Ethnicity Ratios

Agency	Af. Am.	Asian	Hispanic	N. Am.	White	Other
LAAB (2004)	105	421	253	30	4733	207
	2%	7%	4%	1%	82%	4%
TMCC (Avg)	25	40	159	27	943	89
	2%	3%	12%	2%	73%	7%

**The LAAB statistics are the number of students who voluntarily responded, not actual total number of students in 2004.*

Diversifying the student population is a priority and faculty will look for opportunities to expose individuals from under-represented populations to the benefits of a career in the Architecture industries.

What group(s) constitutes the program's largest market?
As illustrated in the charts above, white males between the ages of 18 and 24 constitute the programs' largest market. This is consistent with the composition of the industry.

What efforts have been made by the program to recruit students?
Faculty members make annual presentations to elementary, junior high, and high school career days. Program activities such as CANstruction, Architects in the Classroom, and ASLA month not only enhance classroom activities for current students, but also attract publicity about the programs.

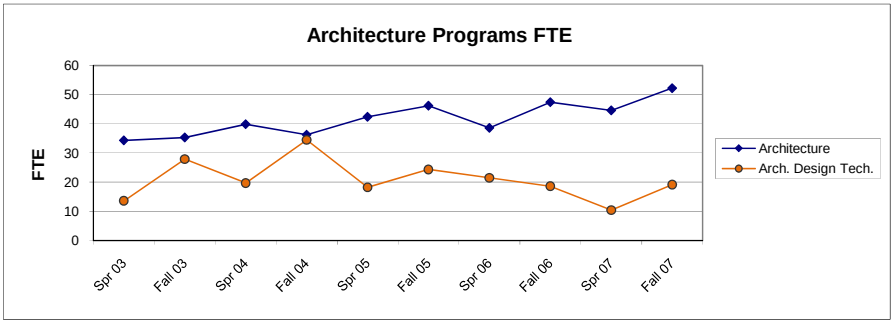
- ☐ October Open House – Over 124 high school students and their family members attended.

- ☐ High School Exploration Day – May 17, about 80 high school students visited the Applied Technologies Center and participated in hands-on activities.
- ☐ View book and fact sheets – The brochure is distributed frequently to promote the Applied Industrial Technologies programs.
- ☐ Television/Video exposure – 30 second ad on TMCC web site, TMCC produced a 30 minute video spot "Focus on Learning" about the Architecture program which regularly airs on cable channel 200.
- ☐ High school recruiting – The AIT department hired a part-time recruiter in 2006-07 to specifically promote its programs. This was in addition to the efforts of TMCC's full-time recruiters.
- ☐ Day on the Hill and Spring Open House - Faculty and student representatives of TMCC's AIAS chapter meet local high school students interested in the program.
- ☐ Building Women career fair – About 100 women participated in March, including hands-on automotive activities.
- ☐ Native American Open House – May 16, more than 100 individuals attended from colonies and reservations throughout northern Nevada.

What efforts have been made by the program to recruit under-served students?
As indicated above, the programs have been active in recruitment efforts for under-represented populations. Notably, the Building Women career fair and the Native American open house

Besides these efforts, landscape technician certification testing takes place on the campus and exposes the facilities and program to a large Hispanic population. This certification is given once each year on the campus in cooperation with the Nevada Landscape Association. By exposing these individuals to the campus during the testing procedures, this population becomes acquainted with the Architecture programs and college environment.

B. Discuss student FTE trends in the program or discipline
Generally, FTE has been climbing in the Architecture transfer program, but following some volatility, has shown some declines in architectural design technologies.



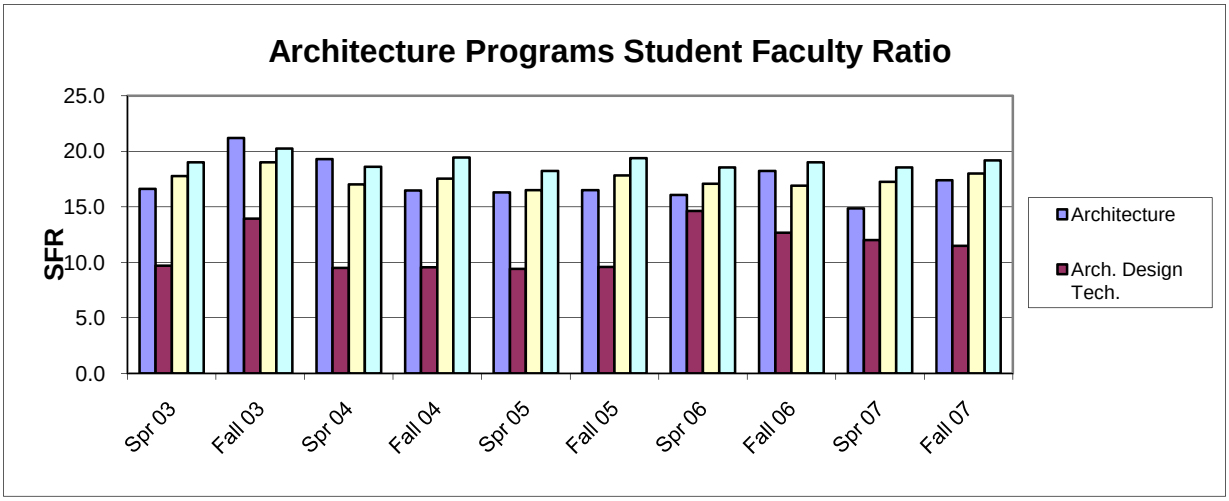
Some decline in ADT courses may be attributed to the increased use of computer-aided drafting in industry which has decreased the number of drafters necessary in architectural firms. The program has also experienced difficulty attracting adequate numbers of students to advanced courses in the golf course management program, resulting in cancellations and an overall reduction of enrollment. We anticipate that the newly introduced AS degree in Horticulture will substantially increase student interest in these courses.

What initiatives have been used to increase the FTE?
Besides the introduction of new degrees and emphases in response to industry demand, the Architecture programs have also initiated a comprehensive review of prerequisites in its degrees and certificates. An initial review revealed that common course numbering and previous program modifications resulted in several errors in prerequisites for many of our courses. In some instances, courses listed prerequisites that no longer existed. In others, multiple levels of prerequisites and redundancy made it nearly impossible for students to register for advanced courses. In the past two years, faculty members have revised the courses to correct these errors. Another effort is underway to eliminate hidden prerequisites from existing degrees and certificates (as discussed in section IV.B.).

C. Analyze trends in the relationship between credit hours offered and student FTE (student to faculty ratio)

Semester SFR ratios
Student-faculty ratios in Architecture courses average 17 SFR during the study period, while Architectural Design Technologies courses averaged 11 SFR. These are consistent with comparable programs regionally and nationwide. According to LAAB accreditation standards and the 2006 NAAB Statistical Report, accredited schools had ratios that ranged from 12 to 16 students per instructor in the western region, while the national average ratio is around 13 students.

How do they compare to programs within your department and the college's overall SFR?
Student faculty ratios in the Architecture AA program are consistent with those of the MSET division and about 10% below the college. The ADT AAS and certificate programs are approximately 35% below the MSET division and 39% below the college.



Discuss reasons for low or declining SFR

Some of the low ratios in architectural design technologies can be attributed to low numbers in the newly created golf course management, turf, and tree care classes. We attribute the low numbers to a lack of awareness in the community of the career opportunities in these programs or a misunderstanding of the offering of these classes in these fields.

We anticipate increased ADT SFR with the implementation of new Horticulture degree which will transfer to the recently introduced UNR and UNLV Horticulture degrees. As more and more people are turning to alternative energy and sustainable jobs, the "green industry" will see an increase in the number of people entering into the professions of golf course management and horticulture. The technology being introduced into these fields will require the knowledge gained from a baccalaureate or graduate degree program. TMCC will be the first step toward that goal as people gain confidence in their ability to advance their knowledge in a community college setting with smaller class sizes and industry professionals that impart their knowledge through instruction.

III. CURRICULUM

A. What are the program's/discipline's methods for evaluating the contents of course offerings (i.e. is curriculum current, appropriate, and effective? Are prerequisites valid/verified?)?

The main focus of the program development is the articulation agreement with the School of Architecture at the University of Nevada, Las Vegas (UNLV), Nevada's only accredited school of architecture. The majority of the courses reflect UNLV's program through accreditation standards, common course numbering, and the desire to create a "seamless" transfer process. It is the goal of the Associate of Arts degrees in Architecture and Landscape Architecture to satisfy the first two years of UNLV's program allowing students to transfer with third year status. Through our articulation agreements, TMCC's classes comply with standards set by the National Architectural Accreditation Board (NAAB) and Landscape Architecture Accreditation Board (LAAB).

The other TMCC Architecture programs which do not directly articulate to UNLV still utilize the structure developed for the Architecture and Landscape Architecture AA degrees. These programs are further evaluated by program advisory committees and modified per their recommendations in response to current industry trends and needs. Although many of the prerequisites have been determined by UNLV and NSHE requirements, the course sequencing is consistent with learning objectives and outcomes necessary for success in the given disciplines.

The Landscape Management, Golf Course Management and Architectural Design Technology programs are consistent with similar programs offered at peer institutions such as College of the Desert in Palm Desert, CA, and Cuesta Community College in San Luis Obispo, CA.

The Golf Course Management program prepares students to enter employment on golf courses at middle management positions, such as foreman or assistant superintendent. The newly developed Horticulture program leads to an Associate of Science (AS) degree and is transferable to both Nevada universities, fulfilling the first two years of the Bachelor of Science degree. The subjects covered in this degree are basic horticulture principles, along with botany, biology and other sciences.

B. In general, what evidence suggests a need for the program/discipline?

With respect to the Architecture and Landscape programs, TMCC has provided regional data that supports a "fair" level of employment opportunity in northern Nevada. However, given the versatility of employment options and further educational opportunities for these disciplines that extend beyond the immediate regional area, anecdotal evidence supports a more robust outlook.

National trends based on information provided by the AIA, the National Council of Architectural Registration Boards (NCARB), the American Society of Landscape Architects (ASLA), and the Council of Landscape Architectural Registration Boards (CLARB) suggest a growing demand for registered design professionals. An employment shortage is developing in the western United States caused by the impending retirement of baby boomers with inadequate numbers of new employees in training to fill the vacancies.

For vocational programs, is there labor market data to support program need?
As indicated in Table 3 below, the state of Nevada anticipates steady growth in new positions for the next eight years in the architecture industry. Coupled with accelerating retirements of existing workers, adequate employment opportunities will exist for the foreseeable future.

Table 3: Nevada Occupational Employment & Projections 2006 – 2016 data

Type	2006	2016	Change	% Change	Annual Avg. Openings
Architectural and Civil Design	978	1,161	183	18.7%	46

(Source: http://www.nevadaworkforce.com/)

What is the student completion rate?
Please see section IV.B.¶

What is the student employment rate?
The college does not track student employment rates; therefore, official figures are not available. Anecdotal evidence suggests that about one-third of our two-year graduates are currently or have been employed in the industry. The majority of the other students advance to university programs to pursue professional degrees.

What is the student transfer rate?
As career programs, students enrolled in the AAS degrees (Architectural Design Technology, Golf Course Management, and Landscape Management) do not have a direct transfer path to baccalaureate programs. Students in the Architecture and Landscape Architecture AA degrees may transfer directly into accredited professional degree programs. Approximately 60-65% of our students pursue additional studies at institutions such as UNLV, Cal Poly, San Luis Obispo, University of Arizona, Arizona State University, New School of Architecture, Southern California Institute of Architecture, and University of Idaho. The college does not provide official transfer statistics.

C. What procedures are being used to ensure that current curriculum is adequately meeting the needs of students?
At the present time, the program is comprised of two full-time faculty members and several part-time instructors who are practicing professionals. Through articulation agreements with UNLV, the curriculum meets the standards established by NAAB and LAAB for professional licensure.

What role have advisory committees played in curriculum review?
The Architecture programs maintain two advisory committees, one for Architecture, Architectural Design Technologies, and Landscape Architecture, and another for Golf Course Management and Horticulture. The committees are comprised of individuals recruited directly from local businesses and agencies and meet two to three times annually to review the programs. Members are chosen for their proven success in the industry and their willingness to commit the time and effort to assist and advise the Architecture programs in employment needs and curriculum development. A list of advisory committee members is provided in the Appendix C.

The newly-developed Residential Design emphasis is a good example of the advisory committee's influence on our programs. Following consultation with the advisory committees, the new emphasis was developed to make it possible to offer an architecture-based AAS degree that allow students who cannot transfer to stay in Northern Nevada and become a design professional. The new degree required the creation of no new courses. Instead, existing courses from this and other disciplines were updated and combined to create this new offering.

When was the last time the curriculum was reviewed?
As a transfer program to accredited schools of architecture and landscape architecture, the courses are subject to review every five to ten years. This process requires a comprehensive review of all courses to ensure they meet nationally established standards by NAAB and LAAB. The curriculum was reviewed and approved during the formal program review process in May 2001.

The Landscape Architecture program at UNLV was reviewed by LAAB in May 2008 and was granted a two year provisional accreditation. Currently, TMCC faculty members are working with their UNLV colleagues implement the changes suggested by the visiting team from LAAB. This will also provide a review of the Landscape Architecture program at TMCC and may require a change to mirror those at UNLV

As part of the continuing review process faculty members discovered that the core classes shared in the various degrees and certificates offered by the Architecture programs had conflicting prerequisites. All changes and updates to course prerequisites are now in process and degree requirements are under review to resolve prerequisite conflicts.

D. Have courses within the program or discipline been articulated with universities or the local school district (tech prep)?
The Architecture and Landscape Architecture programs currently have a formal articulation agreement with the UNLV School of Architecture as well as common course numbering which ensures similar courses share numbers, names, and credits.

What efforts have been undertaken to increase articulation agreements?
Architecture faculty members are currently negotiating with the NewSchool of Architecture and Design in San Diego, California. At this time, we are optimistic an agreement will be in place in Fall 2008. Although no formal articulation agreements exist, TMCC Architecture students generally experience seamless transfer to out of state institutions such as Cal Poly at San Luis Obispo, and the University of Idaho.

Courses in the newly-approved Associate of Science in Horticulture have been fully articulated with UNR and UNLV. Graduates of TMCC's program will enter the universities with third-year status.

Besides traditional articulation agreements, the Architecture programs are also part of an informal "reverse" articulation with UNR's Interior Design program. Interior design students in this baccalaureate program are required to take several TMCC courses including AAD 125, ADT 105, ADT 108, BI 101B, and CADD 100.

E. What has been done to validate the appropriateness of the degree and certificate requirements offered by the program/discipline?

As indicated above, articulation agreements with UNLV's accredited degree programs mandate compliance with accrediting agency standards. Furthermore, degree and certificate requirements are validated by ongoing dialogue with other institutions that accept our students. Advisory Committee members also provide professional feedback during regularly scheduled meetings and ensure that the requirements meet NAAB and LAAB standards. The faculty members have also reviewed other degree and certificate programs at peer institutions in the western United States that offer Architecture and Landscape Architecture degrees.

F. Describe recent departmental innovation undertaken in the program/discipline.

To keep pace with the industry, the Architecture programs are currently undergoing a shift from computer applications that produce two-dimensional drawings to three-dimensional computer modeling of integrated building design. For example, we are currently incorporating Revit, a building information modeling (BIM) and software system to replace AutoCAD. In the past few years, we have supplemented the curriculum by using a diversity of applications such as SketchUP, Photoshop, Illustrator, and Land Development Civil.

Community service is a primary element of the Architecture programs at TMCC, which has differentiated our program from others locally and nationally. It provides our students a unique perspective for their future professional lives. Student participation in the annual CANstruction community food drive sponsored by AIA encourages civic responsibility and provides thousands of pounds of food for needy families in northern Nevada. Additional community based projects and activities are conducted in the classroom, while professional jury presentations and portfolio reviews innovative mainstays of innovation of our programs.

RECOMMENDATIONS:

The Architecture programs must continually monitor the market and regulatory environments to adapt the curriculum to emerging trends. The need for sustainable designs utilizing new technology and the building codes that regulate them will continue to shape the industry for the foreseeable future. Courses must be regularly updated to reflect these changes. Continued emphasis on community-based projects and the involvement of professionals from the area will ensure that the programs are able to incorporate these trends into the courses.

Faculty members must also respond to changes in national accrediting standards to ensure continued articulation with the University of Nevada, Las Vegas. Adherence to these standards will also improve our ability of establishing additional articulation agreements with other accredited programs in the western region.

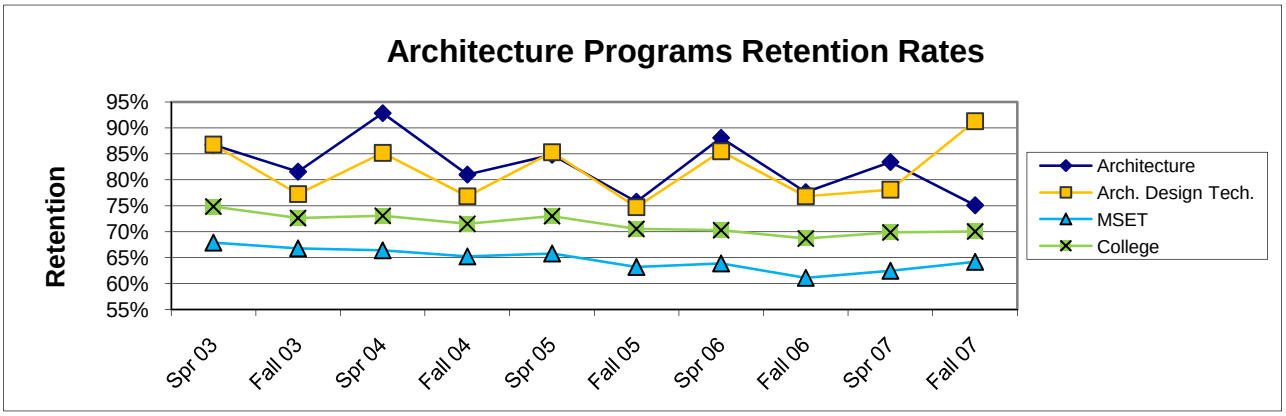
Industry standards for the local region are reinforced by the continued involvement of the two advisory committees. Faculty members must actively work with committee members to evaluate and implement acceptable advisory committee recommendations into the program. It is also recommended that faculty explore pedagogical and technical innovations successfully implemented by peer institutions and modify the curriculum as necessary.

It is also necessary to evaluate the impact of the newly developed degrees in Horticulture and Residential Design for their impact on existing degrees. For example, a pending articulation agreement with UNLV and UNR for Horticulture may impact other degrees, such as Golf Course Management. Degree and program revisions may be necessary to accommodate the articulated degrees and ensure student success.

IV. STUDENT SUCCESS

A. Analyze the program's retention rate and discuss any trends. For disciplines, address student progression rate.

Student retention rates in both the Architecture and Design courses historically exceed both the college and the division. While the college averages around 65% and MSET around 73%, Architecture and Design courses fluctuate between 75% and 90% for an average of about 83%.



Retention rates for both programs tend to be lower during Fall semester than Spring semester of the same academic year. We attribute this to the greater number of students entering Architecture classes for exploratory purposes in the Fall semester. Spring semester students tend to be those who have chosen to continue their Architecture studies and, therefore, are more committed to completing their courses.

What efforts have been made to increase student retention?

The technical courses engage students early in the semester with creative hands-on projects that are frequently displayed to the campus community. These activities reinforce a student's sense of accomplishment and encourage his/her continued success.

The Architecture programs also sponsor an active student chapter of the American Institute of Architects (AIAS). This organization provides a critical link between the students and the professional communities. Its activities not only raise public awareness and goodwill, but also build camaraderie among the participants. This sense of "belonging" contributes significantly to higher retention and persistence rates.

Discuss student retention trends by course.

Table 4 illustrates that most Architecture and Architecture Design courses exceed the averages of the college and the division. Students in most of these classes are pursuing either their degrees or transfer to professional programs. The high retention rates are a reflection of their commitment to their programs.

As a general education course, AAD 201 attracts students from the general population who are not necessarily pursuing training in Architecture or Architecture Design. As a result, its 73% retention rate more closely resembles the overall college rate of 65%. Similarly students in AAD 100 and ADT 168B, are also from the general population and

are exploring the potential for pursuing additional Architecture and Landscape Architecture training. Many of them choose another direction.

Common course numbering has resulted in changes for AAD 105 which was changed to AAD 181, and ADT 211 which is now AAD 265. The newly numbered courses have retention rates comparable to the rest of the Architecture program. ADT 109 has been discontinued in common course numbering.

We anticipate improved retention for ADT 245 with the implementation of the new Residential Design AAS degree and the growth of the construction management emphasis both of which require this course.

Table 4: Retention Rates per Course

Course	Retention	Course	Retention
AAD 100	68%	AAD 236	97%
AAD 101	70%	AAD 257	75%
AAD 105	69%	AAD 262	100%
AAD 106	91%	AAD 265	88%
AAD 107	89%	AAD 280	96%
AAD 114	79%	AAD 282	100%
AAD 125	86%	ADT 105	80%
AAD 126	77%	ADT 108	84%
AAD 127	77%	ADT 109B	63%
AAD 128	90%	ADT 168B	72%
AAD 129	90%	ADT 172B	79%
AAD 180	82%	ADT 173B	86%
AAD 181	82%	ADT 174B	90%
AAD 182	88%	ADT 178B	76%
AAD 183	90%	ADT 211B	70%
AAD 201	73%	ADT 218B	100%
AAD 202	81%	ADT 225B	77%
AAD 223	98%	ADT 245B	71%
AAD 226	96%	ADT 255B	67%
AAD 227	96%	ADT 256B	100%
AAD 228	95%	ADT 268B	90%
AAD 229	95%	ADT 272B	95%
AAD 230	77%	ADT 274B	77%
AAD 235	100%	ADT 290B	100%

B. Analyze graduation trends within the program (not applicable for disciplines).
As illustrated in Table 5, students earning their AA Degree in Architecture may transfer directly to the baccalaureate program at UNLV as juniors. The program reached a peak of eight graduates in 2005 before declining in 2006 and improving again in 2007. No students graduated from Landscape Architecture during the study period.

Golf Course Management typically has one or two students graduate per year, while the Architectural Design Technology AAS and certificates of achievement only periodically graduate one or two students.

Table 5: Architecture Program Graduation Rates

Degree	Emphasis	2003	2004	2005	2006	2007
AA	Architecture	2	5	8	2	4
	Landscape Architecture					
AAS	Architectural Design Technology			3	2	
	Golf Course Management	1	1	1	1	2
CT	Architectural Design Technology			1		
	Landscape Management				1	

If numbers have dropped off or have traditionally been low, provide an explanation.
Graduation rates in the AAS degrees have traditionally been low because students can often secure employment by completing their technical training without the degree. Faculty members, however, continue to encourage students to complete their degrees.

Only a limited number of students pursue the certificates of achievement as reflected in the graduation rates. Students who enter the program pursuing a certificate often discover the expanded benefits of the two-year degrees and continue their studies. Nonetheless, the certificates are valuable in attracting new students to the program.

What efforts have been made to increase program completion?
As indicated earlier, the program has initiated a review of prerequisite errors. Several AAD and ADT courses listed inaccurate, redundant, or non-existent prerequisites and revisions have been submitted to correct these errors. Our next effort will be directed toward correcting hidden prerequisites in our degrees and certificates. Table 6 summarizes a preliminary review which revealed that every degree and certificate includes courses with prerequisites that are not listed within the degree requirements, effectively increasing the credit load for students by as much as 11 credits.

Table 6: Hidden Prerequisites

Degree	Emphasis	Required Course	Hidden Prerequisite	Added Credits
AA	Architecture	AAD 265	AAD 223	3
		ADT 245B	ADT 255B	3
	Landscape Architecture	AAD 262	AAD 223	3
AAS	Architectural Design Tech.	AAD 262	AAD 223	3
		AAD 265 (elective)	AAD 280, 282	6

Degree	Emphasis	Required Course	Hidden Prerequisite	Added Credits
	Golf Course Management	ADT 218B	ADT 105B, 108B	8
		IS 201	IS 101	3
CT	Architectural Design Tech.	ADT 218B (elective)	ADT 108 (elective)	(3)
	Landscape Management	ADT 170B	CHEM 100	3
		ADT 218B	ADT 105B	5

Improved articulation agreements with UNLV as well as other institutions in California should encourage increased graduation rates in the AA degree.

C. What has the program/discipline done to measure and assess student-learning outcomes (i.e. skills and knowledge acquired)? Use the data from the program's/discipline's Assessment Plan and Assessment Report to address this section and include copies of these documents in the Appendix.

The Architecture programs maintain an assessment plan found in Appendix D. One goal is measured each year. In previous years, the programs evaluated student performance on a community-based project and presentation, as well as successful transfer to baccalaureate programs.

The most recent assessment involved a survey of local employers to evaluate the preparedness of TMCC graduates. As described below, the employer response was generally favorable.

- ☐ A majority agreed that TMCC students conduct themselves in a professional manner and possessed the skills expected from a two-year academic program.
- ☐ A majority indicated that students need better communication skills, both verbal and graphic.
- ☐ All respondents agreed or strongly agreed with the statement, "I would recommend a TMCC student to my fellow professionals."

Survey respondents were also given the opportunity to make recommendations for improvement. Some of the responses are listed below:

- ☐ Employers recommended that the program incorporate additional training in computer applications such as code and cost estimating.
- ☐ One respondent preferred students who had worked on real-world projects, not just abstract concepts.

The employers also identified the type of tasks typically assigned to new hires as entry level computer drafting, hand graphic skills, some material research and sample boards, filing and document management, and area takeoffs. They also prefer students with good phone skills, flexibility, and a willingness to take on new tasks.

Most firms stated they would hire our students "under the right circumstances" and based on the individual's abilities. All firms surveyed said they would like to be contacted in the future by students looking to satisfy their internships.

The surveys in total will be shared with the Architecture and Landscape Architecture Advisory Committee for their review and comment. Further recommendations from that committee will be solicited for our instructors and Administration to consider.

RECOMMENDATIONS

The Architecture programs should continue to emphasize creative hands-on projects that involve the professional community as well as community involvement as a means to enhance the student's educational experience and maintain its strong retention rates. Continued support of the AIAS chapter will also contribute significantly to on-going student success.

The programs should pursue increased completion rates by reviewing all degree and certificate requirements and making the necessary revisions to ensure that all courses are appropriate. Degree revisions should also eliminate hidden prerequisites, either by listing all prerequisites in the requirements or making the necessary course modifications to drop the prerequisite.

It is also necessary to review the viability of each degree. For example, the Associate of Arts in Landscape Architecture is nearly identical to the AA in Architecture, with the exception of two courses. No students have graduated in Landscape Architecture, however, since 2001. It may be possible to revise the AA in Architecture to include two tracks—one for Design and the other for Landscape Architecture. Articulation and transfer agreements, however, may limit the number of available options for these revisions.

Faculty members should also continue to improve the programs through assessment of student learning outcomes.

V. RESOURCES AND DEVELOPMENT

A. How many full-time faculty members teach within this program/discipline?
During the study period, the programs were staffed by two full-time faculty members, Ellis Antunez, and Ric Licata.

What percent of the program's/discipline's courses (credit hours) does full-time faculty teach?
As illustrated in Table 7, the percentage of credits taught by full-time faculty members has decreased as the programs have grown. The number of credits being taught by part-time instructors has increased as a greater number of qualified professionals has become available to teach our courses.

Table 7: FT:PT Ratios by Program

Prefix	Type	Spr 03	Fall 03	Spr 04	Fall 04	Spr 05	Fall 05	Spr 06	Fall 06	Spr 07	Fall 07
AAD	FT	28	22	25	31	34	30	33	27	33	30
		90%	88%	81%	91%	85%	71%	92%	69%	73%	67%
	PT	3	3	6	3	6	12	3	12	12	15
		10%	12%	19%	9%	15%	29%	8%	31%	27%	33%
ADT	FT	11	16	12	17	6	9	3	0	0	3
		61%	57%	41%	38%	23%	29%	14%	0%	0%	12%
	PT	7	12	17	28	20	22	19	22	13	22
		39%	43%	59%	62%	77%	71%	86%	100%	100%	88%
All Courses	FT	39	38	37	48	40	39	36	27	33	33
		80%	72%	62%	61%	61%	53%	62%	44%	57%	47%
	PT	10	15	23	31	26	34	22	34	25	37
		20%	28%	38%	39%	39%	47%	38%	56%	43%	53%

What effect has the program's/discipline's full-time/part-time teaching ratio had upon quality provided to students?
With only two full-time faculty members, it is necessary for each of them to regularly teach overload credits to accommodate students' completion of their studies. Several credits taught by full-time faculty members in Table 7 represent independent study and internship courses. Nonetheless, the trend clearly shows an increasing dependence upon part-time instructors, primarily in ADT courses.

While the college recommends that full-time faculty members teach 60% of classes, the Architecture programs have declined from a high of 80% to around 50% in recent years. As transfer courses which require instructors with graduate degrees, the vast majority of AAD credits are taught by full-time faculty members. Most ADT courses, on the other hand, fulfill requirements in the non-transfer AAS degrees and are mostly taught by part-time instructors who are working professionals. They bring valuable insight to the classes they teach.

Continued program growth, however, will require a greater reliance on part-time instructors and decrease the full-time/part-time ratio until a new full-time faculty position is funded. It is also necessary to recognize that the current faculty members will be approaching retirement in the coming decade.

B. Are the staffing, facilities and resources (including equipment, location and budget) adequate to meet the needs of all courses offered within the program/discipline?

Generally, the facilities and resources are satisfactory, but not optimal. They do not meet the LAAB and NAAB standards for teaching ratios, studio needs, computer and library resources. Computer lab does not allow for all students to take design and computer classes concurrently as listed in catalog and at UNLV. The studio accommodates 24 students but only 17 computer stations are available for the concurrent computer class. An expanded computer classroom would resolve this issue. Inadequate space also limits some class sizes and inhibits the amount and types of materials that can be accepted through donations or purchases. Additional storage would also improve our ability to require more complex student projects.

Table 8: Classrooms & labs

Room	Square Feet	Capacity	Description
EDSN 122	1,235	40	General Classroom
EDSN 210	862	19	Manual Drafting Classroom
EDSN 214	874	20	CAD/Computer Lab
EDSN 221	839	24	General Classroom
SIER 209	763	24	General Classroom
SIER 210	820	19	CAD/Computer Lab
SIER 211*	1,188	24	Manual Drafting Classroom
SIER 212	820	17	CAD/Computer Lab
SIER 213*	656	30	General Classroom
SIER 215*	656	28	General Classroom
SIER 216*	820	213	Photo Computer Room

**SIER 215 and 216 are also used extensively by GRC and ART. SIER 211 is shared with DFT, GRC and ART, while SIER 213 is used by TMCC High School until 7:00PM*

The programs are supported by one classified administrative assistant in the Construction Technologies unit of the Applied Industrial Technologies department at Edison. The physical separation does create special obstacles, but issues that require immediate attention can be handled by the support staff in the MSET dean's office.

C. What evidence is there that faculty are staying current in their respective disciplines and instructional methodologies (i.e. workshops, conferences)?

All full and part-time faculty members are practicing professionals and are required by license to maintain current continuing education credits by attending workshops, seminars, and conferences

The faculty members teaching in these programs provide a distinct strength. The professional qualifications of the primary instructors demonstrate clear mastery of their respective disciplines. Faculty members hold appropriate professional licenses and advanced degrees and are active in their respective professional organizations including

the American Institute of Architects (AIA), Council of Landscape Architectural Registration Boards (CLARB), and the American Society of Landscape Architects (ASLA). They are also active in the national registration testing and accreditation of other accredited institutions. Program Coordinator Ellis Antuñez has been singled out for his national leadership role with CLARB and his election to the ASLA Council of Fellows in recognition of his exemplary professional contributions. Ric Licata is the state president for AIA and provides a professional and in depth connection to the industry and professionals.

The part-time instructors teaching in the programs are also highly trained professionals and add significantly to the effectiveness of the overall delivery of instruction. All part-time instructors are active in the practice and provide critical industry experience. They each hold the appropriate licensure and registration in the profession. Given the limited number of full-time faculty members, the addition of part-time instructors serves an essential function in providing a wider variety of perspectives for the students.

Table 9: Faculty Credentials

Instructor	Yrs in Industry	Degrees/Certificates	Maintaining Currency
Ellis Antunez, FASLA	35	MS Regional Planning, 1997, University of Nevada, Reno BS Landscape Architecture, 1974, California State Polytechnic University, Pomona AA Horticulture 1968, College of the Desert, Palm Desert Registered Landscape Architect, Nevada, California, Arizona (First Registered in 1981)	Attend annual ASLA conference, Nevada Landscape Association Conference, other seminars and conferences pertaining to profession.
Ric Licata, AIA	32	MA, NewSchool of Architecture and Design, 2003, San Diego BS Architecture, 1976, Lawrence Institute of Technology, Detroit	AIA Nevada Silver Medal, 2008 Speaker at AIA Grassroots National Leadership Conference 2008 and 2009 Attend AIA National Conference 2008 and 2009 Attend AIA Western Mountain Region Conference Regional Director 2009-2011, AIA Western Mountain Region; President AIA Nevada; AIA National Board Member, 2009-2011.

D. What self-supported efforts has the program/discipline engaged in to increase available resources?

Contributions to the Architecture programs from the professional design community have been extremely helpful. Besides material donations, such as library materials, these individuals and companies have contributed to the program in a variety of ways, including guest lectures in our classes and hosting class visits to their firms and operations. In the past five years the program has conducted a small number of workshops, but has not charged for them.

Resources or services acquired from donations, grants or volunteers

Local industry partners contribute regularly in terms of their time spent participating in juries for projects of the design students, donating materials such as Mylar drafting media, other drafting equipment, reference books and supplies for the model building projects. The programs also regularly pursue grants from the TMCC Foundation and recently received funding for a large-format copier used to duplicate drawings.

Resources generated from workshops, fund raisers, etc.

Due to the load of the faculty and keeping current with their profession, faculty members do not have sufficient time to generate extra revenues. Faculty members have helped organize the student chapter of the American Institute of Architecture Students (AIAS) which holds regular fundraisers such as t-shirt sales that support student travel, speakers, and campus activities. Currently, the faculty is assisting the students to initiate an American Society of Landscape Architecture student chapter.

RECOMMENDATIONS:

The two full-time instructors are regional and national leaders in their professional organizations. They have done an outstanding job managing the growing programs at TMCC while continuing to be active in the profession. The full-time/part-time ratio will continue to deteriorate as the Architecture programs grow and our dependence on part-time instructors increases. Existing full-time instructors will also approach retirement age in the next decade. It will not only be necessary to add a new instructor to accommodate increased demand, but also prepare for faculty retirements.

The growing programs are also encountering space limitations. To fully meet recommendations by the NAAB and LAAB, dedicated studio space and an expanded computer lab will be necessary. Additional storage space would alleviate issues related to equipment security, material storage, and student projects.

Continued work with the professional community not only will allow the program to enhance the learning objectives through contact with professionals in the field. This contact will also benefit the program through on-going donations of materials, supplies, and equipment.

VI. CONCLUSION

In keeping with the mission of the college, the Architecture unit has viable and growing programs that comply with national accreditation standards and fill a critical need in the community, especially as the building industry adapts to decreased reliance on fossil fuels in favor of sustainable designs. Students learn highly marketable skills for entry into the industry or continuation to a professional degree. The faculty members are also highly committed to incorporating civic responsibility and community service into the curriculum.

Continued progress will depend upon the ability of the college to maintain a highly professional staff. The current faculty members, through their participation in community, regional, and national affiliations, bring an exceptional level of expertise to the programs. Their respected standing in the professional community has attracted significant industry involvement in classroom projects and internships. It is necessary, however, to anticipate the impact on the programs as these individuals approach retirement age in the coming decade. Maintaining the high level of quality they have established will require an extraordinary recruitment effort to attract equally qualified professionals. Additionally, while increasing numbers of capable part-time instructors have bolstered the program in recent years, the full-time/part-time ratio has now fallen below preferred levels. It will become difficult to accommodate additional growth in the next five to ten years and maintain the high level of quality without a new full-time faculty position.

While enrollment in AAD courses has steadily increased, and ADT courses have remained static, recent program revisions should and the coming introduction of new degrees should accelerate enrollment growth. The faculty members and student organization should continue recruitment efforts, especially those that target under-represented populations. Current students will be particularly effective in communicating the program's benefits to prospective students.

With new curriculum in place and enrollment growing, the next priority for the Architecture programs is improving student graduation rates. The programs must make revisions to its degrees and certificates to ensure that all required courses are listed and appropriate. The faculty members should also pursue additional articulation agreements with other accredited baccalaureate and professional programs in the western United States. These additional agreements would have a positive effect on graduation rates by giving our students a greater variety of choices and the option to continue in a program that features specialized training. The programs must also continue efforts to improve graduation rates in the AAS degrees by incorporating acceptable recommendations from the advisory committees that enhance career options of the graduates. Faculty members will also actively advise students to pursue graduation from these degrees to improve their employability and opportunities for continuing education.

APPENDIX A: ARCHITECTURE PROGRAMS AA, AAS DEGREES AND CERTIFICATES

Architecture

Associate of Arts

This is a two-year transferable program leading to an associate of arts in architecture. The architecture field encompasses the design philosophies, methodologies, theories and techniques necessary to provide a basis of understanding of what it takes to become an architect or work in the field. All courses recommended will partially satisfy the bachelor of science in architecture and/or master of architecture at the University of Nevada, Las Vegas. Students have also applied these courses to other accredited schools of architecture throughout the Western United States, thus fulfilling the requirements for entrance into third-year status.

General Education Requirements

Courses with a 'B' designator do not usually transfer toward baccalaureate degrees.

Diversity **(3 credits)**

See the diversity section of the general education descriptions for a complete list of courses.

English **6 credits**

ENG 101 and 102 or ENG 113 and 114

Fine Arts **3 credits**

Required: ART 101

Humanities **6 credits**

Required: AAD 201/HUM 201, PHIL 102

Mathematics **3 credits**

Choose from: MATH 126*, 127 or 181

* Required by UNLV

Science **4 credits**

Required: PHYS 151

Social Sciences/Constitution **12 credits**

Must include U.S. and Nevada Constitutions.

Choose from the following recommended courses: PSC 103, GEOG 106, ECON 103, PSY 101, ANTH 101 or SOC 101

Total General Education Requirements 34 Credits

Core Requirements

AAD 100 Introduction to Architectural Design 3
AAD 101 Design with Nature 3
AAD 125 Construction Drawings and Detailing 3
AAD 180 Fundamentals of Design I 3
AAD 181 Fundamentals of Design I Discussion 3
AAD 182 Fundamentals of Design II 3
AAD 183 Fundamentals of Design II Discussion 3
AAD 202 Analysis of the Built Environment 3
AAD 230 Design with Climate 3
AAD 265 Computer Applications in Architecture I 3
AAD 280 Fundamentals of Architecture Design I 3
AAD 282 Fundamentals of Architecture Design II 3
ADT 245B Static and Strength of Materials 3

Total Core Requirements 39 Credits

Total Degree Requirements 73 Credits

Suggested Course Sequence

First Year	Course #	Title	Credits
		1st Semester	
Core	AAD 100	Introduction to Architectural Design	3
Core	AAD 101	Design with Nature	3
Core	AAD 180	Fundamentals of Design I	3
Core	AAD 181	Fundamentals of Design I Discussion	3
English	ENG 101	Composition I	3
Mathematics	MATH 126	Pre-Calculus I	3
		Total	18
		2nd Semester	
Core	AAD 125	Construction Drawing and Detailing	3
Core	AAD 182	Fundamentals of Design II	3
Core	AAD 183	Fundamentals of Design II Discussion	3
Core	AAD 202	Analysis of the Built Environment	3
English	ENG 102	Composition II	3
Science	PHYS 151	General Physics	4
		Total	19
Second Year	**Course #**	**Title**	**Credits**
		1st Semester	
Humanities/ Diversity	AAD 201	History of the Built Environment	3
Core	AAD 280	Fundamentals of Architectural Design I	3
Fine Arts	ART 101	Drawing I	3
Humanities	PHIL 102	Critical Thinking and Reasoning	3
Social Sciences	Elective	Choose from recommended courses	6
		Total	18
		2nd Semester	
Core	AAD 230	Design with Climate	3
Core	AAD 265	Computer Applications in Architecture I	3
Core	AAD 282	Fundamentals of Architectural Design II	3
Core	ADT 245B	Static and Strength of Materials	3
Constitution	Elective	Choose from recommended courses	3
Social Sciences	Elective	Choose from recommended courses	3
		Total	18
		Degree Total	73

Landscape Architecture

Associate of Arts

The student will gain the needed skills to continue education in a professional program of landscape architecture at the university level. Also, provide for entry-level positions in landscape architectural, architectural, multidisciplinary, construction and design/build firms. This degree satisfies the educational requirement of the Nevada State Board of Landscape Architecture to sit for the national examination, after completing the internship and experience requirement.

General Education Requirements

Courses with a 'B' designator do not usually transfer toward baccalaureate degrees.

Diversity **(3 credits)**

See the diversity section of the general education descriptions for a complete list of courses.

English **6 credits**

Required: ENG 101 and 102 or ENG 113 and 114

Fine Arts **3 credits**

Required: ART 101

Humanities **6 credits**

Choose from: AAD/HUM 201, AAD/HUM 202, PHIL 102

Mathematics **3 credits**

Choose from: MATH 126*, 127 or 181

* Required by UNLV

Science **3 credits**

Choose from: BIOL 100 or GEOG 103

Social Sciences/Constitution **12 credits**

Must include both U.S. and Nevada Constitutions.

Choose from the following recommended courses: PSC 103, GEOG 106, ECON 103, PSY 101, ANTH 101 or SOC 101

Total General Education Requirements 33 Credits

Core Requirements

AAD 100 Introduction to Architectural Design 3
AAD 101 Design with Nature 3
AAD 125 Construction Drawings and Detailing 3
AAD 180 Fundamentals of Design I 3
AAD 181 Fundamentals of Design I Discussion 3
AAD 182 Fundamentals of Design II 3
AAD 183 Fundamentals of Design II Discussion 3
AAD 202 Analysis of the Built Environment 3
AAD 230 Design with Climate 3
AAD 257 Plant Materials 3
AAD 262 CAD for Landscape Architecture 3
AAD 280 Fundamentals of Architecture Design I 3
AAD 282 Fundamentals of Architecture Design II 3

Total Core Requirements 39 Credits

Total Degree Requirements 72 Credits

Suggested Course Sequence

First Year	Course #	Title	Credits
		1st Semester	
Core	AAD 100	Introduction to Architectural Design	3
Core	AAD 101	Design with Nature	3
Core	AAD 180	Fundamentals of Design I	3
Core	AAD 181	Fundamentals of Design I Discussion	3
English	ENG 101	Composition I	3
Mathematics	MATH 126	Pre-Calculus I	3
		Total	18
		2nd Semester	
Core	AAD 182	Fundamentals Design II	3
Core	AAD 183	Fundamentals of Design II Discussion	3
Core	AAD 257	Plant Materials	3
Core	AAD 262	CAD for Landscape Architecture	3
English	ENG 102	Composition II	3
Science	BIOL 100	General Biology for Non-Majors	3
		Total	18
Second Year	**Course #**	**Title**	**Credits**
		1st Semester	
Core	AAD 125	Construction Drawing and Detailing	3
Humanities/ Diversity	AAD 201	History of the Built Environment	3
Core	AAD 280	Fundamentals of Architectural Design I	3
Fine Arts	ART 101	Drawing I	3
Social Sciences	Elective	Choose from recommended list	3
Social Sciences	Elective	Choose from recommended list	3
		Total	18
		2nd Semester	
Core	AAD 202	Analysis of the Built Environment	3
Core	AAD 230	Design with Climate	3
Core	AAD 282	Fundamentals of Architectural Design II	3
Constitution	Elective	Choose from recommended courses	3
Humanities	Elective	Choose from list	3
Social Sciences	Elective	Choose from recommended courses	3
		Total	18
		Degree Total	72

Architectural Design Technology

Associate of Applied Science

This is a two-year program leading to an associate of applied science in architectural design technology. The student who completes this field of study will have the skills, knowledge and abilities to work in the field of architecture as a computer aided draftsperson, construction field representative, residential draftsperson, construction detailer, entry level plans examiner, or entry level planner.

General Education Requirements

Diversity **(3 credits)**
See the diversity section of the general education descriptions for a complete list of courses.

English/Communications **6 credits**
Required: ENG 101 and BUS 107

Human Relations **3 credits**
Required: CPD 124 or MGT 171

Quantitative Reasoning **3 credits**
Required: MATH 106B or 108B

Science **8 credits**
Required: PHYS 100 or CHEM 104
Required: GEOG 103 or GEOL 101

Social Sciences/Humanities **3 credits**
Recommended: AAD 201

U.S. and Nevada Constitutions **3 credits**
Required: U.S. and Nevada Constitutions

Total General Education Requirements 26 Credits

Core Requirements

AAD 100 Introduction to Architectural Design 3
AAD 125 Construction Drawings and Detailing 3
ADT 105 Architectural Drafting I 5
ADT 256B Introduction to Land Use Planning 3
ADT 290B Intern in Arch Design Technology 3
BI 101B Introduction to Building Codes 3
CADD 100 Introduction to Computer-Aided Drafting 3
SOL 100B Introduction to Solar Energy 3
SUR 161 Elementary Surveying 4

Choose 3 credits from the following

AAD 262 CAD for Landscape Architecture or ..... (3)
AAD 265 Computer Applications in Architecture I ..... (3)

Electives–Choose 3 credits from the following

ADT 225B Independent Study .....(1-4)
ADT 255B Properties of Materials ..... (3)
Extra Credits from science general education requirement..... (2)

Total Core Requirements 36 Credits

Total Degree Requirements 62 Credits

Suggested Course Sequence

First Year	Course #	Title	Credits
		1st Semester	
Core	AAD 100	Introduction to Architectural Design	3
Core	ADT 105	Architectural Drafting I	5
English	ENG 101	Composition I	3
Quantitative Reasoning	MATH 108B	Math for Technicians	3
		Total	14
		2nd Semester	
Core	AAD 125	Construction Drawing and Detailing	3
Core	BI 101B	Introduction to Building Codes	3
Communications	BUS 107	Business Speech Communications	3
Core	CADD 100	Introduction to Computer-Aided Drafting	3
Science	PHYS 151	General Physics	4
		Total	16
Second Year	**Course #**	**Title**	**Credits**
		1st Semester	
Social Science/ Humanities/ Diversity	AAD 201	History of the Built Environment	3
Core	SUR 161	Elementary Surveying	4
Core	SOL 100B	Introduction to Solar Energy	3
Core	Elective	Choose from ADT 225B or ADT 255B	3
Science	Elective		4
		Total	17
		2nd Semester	
Core	ADT 256B	Introduction to Land Use Planning	3
Core	ADT 290B	Internship in ADT	3
Core	Elective	Choose from AAD 262 or AAD 265	3
Human Relations	MGT 171	Supervision	3
U.S. and Nevada Constitutions	PSC 103	Principles American Constitutional Government	3
		Total	15
		Degree Total	62

Golf Course Management

Associate of Applied Science

This program of study will prepare the student who is interested in the management of golf course greens, tees and other landscape areas. Courses that are taken in this program prepare a student to become an assistant superintendent on a golf course, in the landscape maintenance field, turfgrass farm or other horticulture endeavors. The emphasis within this curriculum is on plants, how they grow, their maintenance, disease prevention and mitigation, along with personnel management skills and techniques.

General Education Requirements

Diversity **(3 credits)**
See the diversity section of the general education descriptions for a complete list of courses.

English/Communications **6 credits**
Recommended: BUS 106, 107

Human Relations **3 credits**
Recommended: MGT 171

Quantitative Reasoning **3 credits**
Recommended: BUS 117B

Science **6 credits**
Recommended: BIOL 100 and CHEM 100

Social Sciences/Humanities **3 credits**
Recommended: SPAN 101B

U.S. and Nevada Constitutions **3 credits**
Recommended: PSC 103

Total General Education Requirements 24 Credits

Golf Course Management Emphasis

Must complete minimum of 41 credits from following

AAD 257	Plant Materials	3
ADT 168B	Landscape Management I	3
ADT 170B	Soil Management	3
ADT 172B	Turfgrass Management I	3
ADT 173B	Turfgrass Management II	3
ADT 174B	Urban Tree Care I	3
ADT 178B	Fundamentals of Horticulture	3
ADT 218B	Landscape Irrigation Design	3-6
ADT 268B	Landscape Management II	3
ADT 272B	Turfgrass Management III	3
ADT 290B	Intern in Arch Design Technology	4-8
IS 201	Computer Applications	3

Total Core Requirements 41-44 Credits

Total Degree Requirements 65-68 Credits

Suggested Course Sequence

First Year	Course #	Title	Credits
		1st Semester	
Emphasis	ADT 168B	Landscape Management I	3
Emphasis	ADT 178B	Fundamentals of Horticulture	3
Science	BIOL 100	General Biology for Non-Majors	3
English	BUS 106	Business English	3
Quantitative Reasoning	BUS 117B	Applied Business Math	3
Prerequisite	IS 101	Introduction to Information Systems	3
		Total	18
		2nd Semester	
Emphasis	ADT 268B	Landscape Management II	3
Communications	BUS 107	Business Speech Communications	3
Science	CHEM 100	Molecules and Life in the Modern World	3
Emphasis	IS 201	Computer Applications	3
Human Relations	MGT 171	Supervision	3
Diversity	AAD 201	History of the Built Environment	3
		Total	18
		Summer-3rd Semester	
Emphasis	ADT 290B	Internship in ADT	4
		Total	4
Second Year	**Course #**	**Title**	**Credits**
		1st Semester	
Emphasis	AAD 257	Plant Materials	3
Emphasis	ADT 170B	Soil Management	3
Emphasis	ADT 172B	Turfgrass Management I	3
Emphasis	ADT 174B	Urban Tree Care I	3
Social Sciences/ Humanities	SPAN 101B	Spanish Conversations I	3
		Total	15
		2nd Semester	
Emphasis	ADT 173B	Turfgrass Management II	3
Emphasis	ADT 218B	Landscape Irrigation Design	6
Emphasis	ADT 272B	Turfgrass Management III	3
U.S. and Nevada Constitutions	PSC 103	Principles of American Constitutional Government	3
		Total	15
		Summer-3rd Semester	
Emphasis	ADT 290B	Internship in ADT	4
		Total	4
		Degree Total	74

Architectural Design Technology

Certificate of Achievement

This is a one and one-half year program leading to a certificate in architectural design technology. This program is designed for those already in the field, who want to hone their knowledge and skills. Also, the students that complete this certificate will have the skills, knowledge and abilities to work in the field of architecture as a draftsperson, entry level plans examiner, or entry level planner.

General Education Requirements

Communications	**3 credits**
Human Relations	**3 credits**
Quantitative Reasoning	**3 credits**
Total General Education Requirements	**9 Credits**

Architectural Design Technology Core Requirements

AAD 100 Introduction to Architectural Design 3
AAD 180 Fundamentals of Design I.....3
AAD 181 Fundamentals of Design I Discussion.....3
ADT 105 Architectural Drafting I.....5
ADT 106B Architectural Drafting II.....5
BI 101B Introduction to Building Codes.....3

Choose one of the following

ADT 230B Mechanical and Electrical Equipment for Buildings or..... (3)
ADT 218B Landscape Irrigation Design..... (3)

Total Core Requirements	**25 Credits**

Architectural Design Technology Emphasis Requirements

AAD 125 Construction Drawings and Detailing 3
CONS 120B Blueprint Reading and Specification 3

Choose one of the following

AAD 235 Architectural Design & Delineation 3
AAD 257 Plant Materials.....3
ADT 108 Architectural Landscaping I.....3
ADT 168B Landscape Management I.....3
ADT 255B Properties of Materials 3
ADT 256B Introduction to Land Use Planning.....3
SOL 100B Introduction to Solar Energy.....3
SOL 200B* Passive Solar Energy.....3
SOL 202B* Active Solar Energy.....3
SOL 205B* Climactic and Solar Design 3
SUR 161 Elementary Surveying.....4

* Contact department for alternative course options for SOL 200B, SOL 202B and SOL 205B

Total Emphasis Requirements	**9 Credits**
Total Certificate Requirements	**43 Credits**

Suggested Course Sequence

First Year	Course #	Title	Credits
		1st Semester	
Core	AAD 100	Introduction to Architectural Design	3
Core	AAD 180	Fundamentals of Design I	3
Core	AAD 181	Fundamentals of Design I Discussion	3
Core	BI 101B	Introduction to Building Codes	3
Emphasis	CONS 120B	Blueprint Reading and Specification	3
Quantitative Reasoning	MATH 108B	Math for Technicians	3
		Total	18
		2nd Semester	
Emphasis	AAD 125	Construction Drawing and Detailing	3
Core	ADT 105	Architectural Drafting I	5
Human Relations	CE 201B	Workplace Readiness	3
Core	Elective	ADT 218B or ADT 230B	3
Communications	ENG 107	Technical Communications I	3
		Total	17
Second Year		1st Semester	
Core	ADT 106B	Architectural Drafting II	5
Emphasis	Elective	Choose from list	3
		Total	8
		Certificate Total	43

Landscape Management

Certificate of Achievement

The two-year course of study for the certificate of achievement with a landscape management emphasis presents the practical field knowledge need to work within the landscape industry. The knowledge gained will prepare the students to attain certification in a variety of specialties including the International Arboriculture Society certified arborist examination and the American Nurseryman's Association certification.

General Education Requirements

Communications **6 credits**
Required: BUS 106 and 107

Human Relations **3 credits**
Required: MGT 212

Quantitative Reasoning **3 credits**
Required: BUS 117B

Total General Education Requirements 12 Credits

Landscape Management Core Requirements

ADT 108 Architectural Landscaping I 3
ADT 168B Landscape Management I 3
ADT 170B Soil Management 3
ADT 172B Turfgrass Management I 3
ADT 174B Urban Tree Care I 3
ADT 178B Fundamentals or Horticulture 3
ADT 218B Landscape Irrigation Design 3
ADT 268B Landscape Management II 3
ADT 274B Urban Tree Care II 3

Total Core Requirements 27 Credits

Emphasis Requirements

Choose 6 credits from the following

ADT 270B Greenhouse Management 3
SUR 161 Surveying I 4
CONS 120B Blueprint Reading and Specification 3

Total Emphasis Requirements 6 Credits

Total Certificate Requirements 45 Credits

Suggested Course Sequence

First Year	Course #	Title	Credits
		1st Semester	
Core	ADT 168B	Landscape Management I	3
Core	ADT 172B	Turfgrass Management I	3
Core	ADT 178B	Fundamentals of Horticulture	3
Quantitative Reasoning	BUS 117B	Applied Business Math	3
Communications	BUS 106	Business English	3
Emphasis	Elective	Choose from list	3
		Total	18
		2nd Semester	
Core	ADT 174B	Urban Tree Care I	3
Core	ADT 218B	Landscape Irrigation Design	3
Core	ADT 268B	Landscape Management II	3
Communications	BUS 107	Business Speech Communications	3
Emphasis	Elective	Choose from list	3
Human Relations	MGT 212	Human Relations	3
		Total	18
Second Year		1st Semester	
Core	ADT 108	Architectural Landscaping I	3
Core	ADT 170B	Soil Management	3
Core	ADT 274B	Urban Tree Care II	3
		Total	9
		Certificate Total	45

APPENDIX C: ADVISORY COMMITTEES

Program	Name	Company
Architecture	Mark Johnson, AIA	Hershnow, Klippenstein Architects
	Larry Macias, AIA	Larry Macias, AIA Architect
	Ron Blakemore, ASLA	Ron Blakemore, ASLA Landscape Architect
	Gordon Aloiau, AIA	Aloiau Architects
	Nate Hudson	TMCC Student
Golf Course Management	Cal Swanson	Dayton Valley Turf
	Dale Carlon, ISA	Rail City Nursery
	Fred Elliot, PGA	Brookside Golf Course
	Tom Neadaeu	Northstar at Truckee G.C.
	Joel Blaker, GCSA	Old Greenwood G.C.
	Mark Callahan	Plumas Pines G.C.
	Debra Robinson	Places Consulting
	Jason Perry	Western Turf
	Kathleen Andrus	TMCC Student

APPENDIX D: ASSESSMENT PLANS

APPLIED INDUSTRIAL TECHNOLOGIES - GOLF COURSE MANAGEMENT PROGRAM

Assessment Plan: 2006 - 07

Program: Golf Course Management ***Division:*** Math, Science, Engineering and Technology ***Year:*** 2006 ***Author:*** Ellis Antunez and Ric Licata **Program Mission** Provide a high quality entry level workforce in the golf course industry for the local community.	**Program Goals**	**Program Outcomes**	**Assessment Measures and Criteria**
	Goal 1: Adequately prepare graduates for entry level manager/superintendent positions in the golf course field.	1a. Students will master Golf Course Management concepts, techniques and terminology. 1b. Students will develop the management skills for day-to-day Golf Course operations.	1a. Students will demonstrate their mastery of Golf Course Management through their personal portfolio/projects. Students will be evaluated yearly. Students will complete a management internship with a local golf course.
	Goal 2. Meet the needs of local employers for entry level Golf Course Management positions.	2. 70% of employer respndents will be satisfied or highly satisfied with TMCC Golf Course Management students.	2. Every three years, a survey will be conducted in April to determine the satisfaction of community Golf Course Management employers.
	Goal 3. Meet the needs of students entering the Golf Course Management industry.	70% of graduate respondents will be satisfied or highly satisfied with the TMCC Golf Course Management program.	3. Every three years, a sufvey will be conducted in April to determine the satisfaction of graduates of the TMCC Golf Course Management program.

APPLIED INDUSTRIAL TECHNOLOGIES - ARCHITECTURE, ARCHITECTURAL DESIGN TECHNOLOGIES AND LANSCAPE ARCHITECTURE PROGRAM

Assessment Plan: **2006 - 07**

Program: Architecture ***Division:*** Math, Science, Engineering and Technology ***Year:*** 2006 ***Author:*** Ellis Antunez and Ric Licata **Program Mission** Provide high-quality training to prepare students entry level work in the field of architecture for the local community.	**Program Goals**	**Program Outcomes**	**Assessment Measures and Criteria**
	Goal 1: Adequately prepare graduates for entry level positions in the architectural field.	1a. Students will master architectural concepts, techniques and terminology. 1b. Students will develop Architectural manual and CAD skills 1c. Students will develop basic design fundamentals and skills.	1a. Students will demonstrate their mastery of architecture through personal portfolio/projects which will be evaluated annually. 1b. Students will demonstrate their basic design fundamentals through jurries of community architects conducted at the end of their studies. 1c. Successful placement of a student in the top 20% of the state SkillsUSA competition and if a student qualifies, placement in the top 30% at the national SkillsUSA competition.
	Goal 2: Adequately prepare graduates for junior standing at UNLV.	Students who graduate from the AA degree in Architecture and matriculate to UNLV will receive junior status.	2. Every three years, a survey will be conducted to determine the status of students who matriculate to UNLV. This survey will be completed in April of each survey year.
	Goal 3. Meet the needs of local employers for entry-level architectural positions.	70% of employer respondents will be satisfied or highly satisfied with TMCC Architectural students.	3. Every three years, a survey will be conducted to determine the satisfaction of community architectural employers. This survey will be conducted in April.