

**PROGRAM REVIEW
CONSTRUCTION TECHNOLOGY
ACADEMIC YEAR
SPRING 2003- SPRING 2004**

Topic I. Where are we now?

A. Purpose & Goals

In adherence to the mission statement of Riverside Community College District, the Construction Technology program seeks to provide accessible, affordable, post-secondary education in the technical area of construction technology. This program seeks to provide career preparation and training that will prepare students for the variety of jobs which are available in this industry. Specifically the program seeks to:

- Enhance the knowledge base of construction forepersons and job superintendents.
- Provide additional training for those preparing for jobs in construction management.
- Provide the technical preparation for those persons preparing for the ICC (International Code Council formerly the International Conference of Building Officials) examinations.
- Provide those preparing for Contractor's license exam the technical information in the major trades.
- Provide updated information of the recent changes in the construction field for those desiring to be current in their knowledge in this field.

The Construction Technology department works in partnership with our industry partners, such as MITA (Masonry Industry Training Association), Inland Empire Roofing Contractor's Association, Citrus Belt Chapter of ICC (International Code Council, formerly International Conference of Building Officials), Cal Poly Pomona's Construction Management Program, Cal Baptist University's Construction Management program, Norte Vista High School, Moreno Valley School District, and Canyon Springs Construction Academy. The program also has sponsored Careers in Construction programs with the Riverside School District on an annual basis.

B. History

Prior to 1994 the Construction Technology classes were offered at all three of the campuses. Low enrollment caused the classes at the Moreno Valley campus to cancel their sections for several years. The result was that the Norco campus absorbed these students with sections also being offered at the Riverside campus. In the late 90's the Construction Program was moved from offering classes at both the Riverside and the Norco campuses, to just offering classes on the Riverside campus. Shortly after this, due to space concerns at the Riverside campus, a facility was obtained at the March Air Force Base. The March Education Center began being used by the Construction classes during the summer of 2000 and today is the home of the Construction Technology program. The facility is currently being shared by the EMT/Paramedic program and the Construction

Technology program. This has been a very compatible relationship. The EMT/Paramedic uses the facility during the day and the Construction Technology program uses it during the evenings.

C. Programs & Curriculum

When the core program of the Construction Technology department is completed it culminates in a certificate in "Construction Technology." When a student has further completed their general education requirements, an Associate in Science Degree in "Construction Technology" is awarded.

This program consists of the following required courses:

- Construction 63 Uniform Building Code
- Construction 64 Office Procedures and Field Inspection
- Construction 65 Uniform Plumbing Code
- Construction 66 National Electric Code
- Construction 67 Uniform Mechanical Code
- Construction 68 Simplified Engineering for Building Inspectors
- Construction 70 Fundamentals of Soil Technology
- Construction 71 Energy Conservation Standards
- Construction 72 California State Accessibility Standards

Only two of the following electives are required for the certificate and/or the A.S. degree:

- Construction 60 Introduction to Construction
- Construction 61 Materials of Construction
- Construction 62 Blueprint Reading
- Construction 73 Project Planning for Site Construction

These classes are offered at least once each year. Several classes, because of the demand in the industry, are offered more frequently. The Uniform Building Code is the primary code of the construction industry. Because of this it has become necessary to offer this class twice a year, once in the fall and once in the spring semester. Also due to a recent state assembly bill, all electricians in the State of California are being required to pass a certification exam 60% of which encompasses the National Electric Code. As a result these classes began filling beyond capacity. Therefore, to meet this demand, the college has been offering the National Electric Code course in both the fall and spring semesters. The Blueprint Reading class has been popular with several groups in the community. Those in the certificate/degree pattern need to acquire two electives and this one is the most popular. In addition to this, the Heating/Air Conditioning program at RCC also utilizes this course for the certificate/degree pattern. The result is that this class is offered four times each year usually with beyond capacity attendance. The construction department therefore seeks to be sensitive to the demands and needs of their industry partners and adjusts its course offerings accordingly.

During the 2003-2004 year, the Construction Technology outlines were revised to reflect appropriate learner oriented student objectives. The most current editions of the texts

used in these courses were also updated. A major change needing Curriculum Committee approval this year was the deletion of the “cost estimating” portion of Construction 62. This course has not included “Cost Estimating” in the course topics for at least the last 10 years. In the future, a separate “Cost Estimating” class could be added to the list of electives for the certificate pattern. The balance of the course changes were minor and will be brought before the Curriculum Committee in the Fall of 2004 for final approval (see Appendix A).

During the 2003-2004 year the apprenticeship programs for the AGC (Associated General Contractors) were deleted through the Curriculum Committee, as were the Line Erector apprenticeship for URB construction. The AGC apprenticeship was deleted because the AGC felt it would be in their best interest to align themselves with San Diego City College. Though the AGC has a regional office in Riverside, their main program and sponsors are located in San Diego. This deletion was initiated by the AGC and RCC, as the LEA (Local Education Agency), was obligated to comply. The URB program was housed in south San Diego, and the administration of the classes was not cost effective for the college. Therefore, RCC gave URB notification and information that it should seek a new LEA (San Diego City College was suggested). This program therefore was deleted as well.

Hybrid Apprenticeship Programs

Because of the demand of our local industry partners, two additional programs have recently been added to the courses being offered:

The Roofing Program is offered in cooperation with the Inland Empire Roofing Contractor’s Association. This program is open to the apprentices in the association and is also open to the general public for those wishing to enhance their knowledge in the area of roofing. Those who would be interested would be contractors, inspectors, homeowners, project managers, and construction superintendents. The program consists of:

- Construction 51 Principles of Roofing I
- Construction 52 Principles of Roofing II
- Construction 53 Principles of Roofing III
- Construction 54 Principles of Roofing IV
- Construction 55 Principles of Roofing V
- Construction 56 Principles of Roofing VI
- Construction 57 Special Topics in Roofing

These courses are completed over a 6 semester period with each course covering a different aspect of the roofing trade.

The Masonry Program is offered in cooperation with MITA (Masonry Industry Training Association). This program is open to apprentices in the MITA organization and is also open to the general public for those wishing to enhance their knowledge in the area of

masonry. Those who would be interested would be contractors, inspectors, homeowners, project managers, and construction superintendents. The program consists of:

- Construction 81 Introduction to Masonry I
- Construction 82 Introduction to Masonry II
- Construction 83 Masonry III
- Construction 84 Masonry IV
- Construction 85 Masonry V
- Construction 86 Masonry VI

These courses are completed over a 6 semester period with each course covering a different aspect of the masonry trade.

D. Student Outcomes Assessment

Most of the student outcome objectives are linked to the demands of our industry partners. State law requires many of those in the construction industry to pass nationally recognized certification examinations. These are administered by the International Code Council (formerly the International Conference of Building Officials -ICBO), the International Association of Plumbing and Mechanical Officials (IAPMO), and Council of America Building Officials (CABO). Our four code classes (the UBC, the UPC, the UMC, and the NEC) help prepare students to pass these examinations. Additionally, many of the courses are linked to specific areas of specialized training. The Soils Technology class culminates in a functional understanding of soils classification based on the Unified Soils Classification System, which is the system used to classify soils under the Uniform Building Code. The Energy Conservation Standards class culminates in an understanding of the California Energy Commission's requirements for residential construction. A certification exam is offered in this area for energy consultants, but currently is not mandated by state law. The California State Accessibility class is directed toward preparing students with the requisite knowledge necessary to assure that the disabled community is accommodated by building design. This also has an ICC certification exam, but is not yet a requirement established by state law. It is an important element of the construction industry because the Americans with Disability Act is federal law. Each of the other classes offered are intended to help augment a knowledge base which would support building construction (i.e. inspection techniques, blueprint reading, a basic understanding of building engineering, materials, and site planning information).

Therefore, success in passing the ICC (International Code Council) certification exams is a measurable assessment instrument in determining how well our learning objectives are being met, especially in the four code classes.

Additionally, since the program only offers one section of the Construction 68 (Simplified Engineering) per year, the success ration of one question of the final exam analyzing a simple beam calculation could be used as an appropriate outcome assessment instrument. In the Construction 70 (Soils Technology) a similar approach could be used on the final exam for the classification of a soil sample.

E. Collaboration with Other Units and Outreach

The Construction Technology discipline works in partnership with our industry partners, such as MITA (Masonry Industry Training Association) and the Inland Empire Roofing Contractor's Association. We currently offer the required coursework for these apprenticeship programs. What is unique about this, is that these classes are also available and open to the general student population at RCC. This program is a cooperative effort with our industry partners to encourage students to pursue careers in masonry and roofing.

Many of our students are either employed or become hired by local jurisdictions as building inspectors, plan checkers, and counter technicians. The classes offered in this area provide the necessary training to equip these students to become more proficient at what they do on a daily basis, as well as providing them the tools necessary to pass the ICC certification exams required now in the state of California.

F. Outreach

From an outreach perspective, Riverside Community College's Construction Technology program has had close working relationships with Norte Vista High School Construction Academy, Moreno Valley School District's F.A.T.E. program, and Canyon Springs Construction Academy. RCC's Construction discipline has also sponsored 'Careers in Construction programs' with the Riverside School District on an annual basis. The Construction Technology program has been in discussion with Cal Poly Pomona's Construction Management Program and Cal Baptist University's Construction Management program about establishing a cooperative relationship for those students who wish to have a smooth transition into the 4-year institutions.

G. Resources

The Construction Technology program has one fulltime faculty and currently five adjunct faculty. Two of the five adjunct faculty have teaching assignments directly linked to the two apprenticeship programs (MITA and Roofing). Most of the construction classes are taught at the March Education Center. This facility is shared with the EMT/Paramedic program. The relationship has worked out very well as the EMT/Paramedic program uses the classrooms during the days and on the week-ends and the Construction Program uses the classrooms at night. The facility is equipped with four classrooms, two which can accommodate 50-60 students and two which can accommodate 25-30 students. With good planning the larger classes are arranged for evenings when the larger classrooms are available. The Construction Department has had to order 36 folding chairs to be able to accommodate the peak period of demand for the evening classes. The largest classes are housed in MEC #1 which can accommodate up to 60 students.

The facility, though newly renovated, is being used quite heavily by all the programs and will need to be monitored to keep up with the normal wear and tear. Storage is nearly at

maximum capacity for the numerous supplies necessary for these programs and may need to be augmented later.

Because of the remote location, maintenance issues are a concern. A broken closure on the front door presented a potential problem and danger during the windy season. However, computer repairs have been attended to with remarkable swiftness. Several recent break-ins are causing concern to the staff because of the impact of equipment losses on instruction. For a short period only 2 of the 4 classrooms had overhead video capacities and the amplification system for the videos in the largest classroom did not work. Though only temporary, these inconveniences do bring out the need for a more elaborate security system.

H. Other Comments

Strategic Enrollment Management. The Construction Technology program is very sensitive to industry needs. When the need for additional sections of the NEC class were evident, we responded by offering these classes twice a year. When it came to our attention that the Blueprint Reading classes were used by more than our discipline, we responded by offering this class each semester. We also have been monitoring classes that are low in attendance and either modifying the class time or dropping the section all together. As a result of this concerted effort our average attendance for all of these sections are 34 students per class for both semesters of the 2002-2003 school year. This is the actual student count at the end of the semester.

I. Overall Assessment of Discipline Performance

The Construction Technology Department has matured and is evolving with the environment. Because of the excellent support of the Applied Technology staff and the administration, growth has been steady and consistent. Also, reflecting on the comments of the Advisory Committee, the performance of the Discipline at the present time is very positive.

Topic II. Where do we want to be?

A. Environment Scan

The building industry is always an indicator of the economic health of the area. It is cyclic. A review of the number of permits and an evaluation of construction activity reveals that this is a 9 -10 year cycle. This overall building industry cycle does reflect and impact the types of students enrolled in the program, but with some interesting dynamics. When the industry is booming and construction is at the peak of its cycle, our class size swells. This is in part by newly hired inspectors, plan checkers, and counter technicians, who either on their own or by mandate of their supervisors begin taking classes to increase their knowledge in the codes. Interestingly, during the bottom of the construction cycle our class attendance remains strong because those who are in the construction industry (generally in the trades or contractors) are looking for a more stable

life style, and thus begin taking classes to become trained in the regulatory side of the industry (inspectors, plan checkers, and counter technicians).

Besides these, we also attract construction managers, engineers, general contractors, and job superintendents who recognize the value of knowing and understanding the construction codes and regulations. Much of the interest in our program is a result of several recent state laws which have impacted the construction industry. After the Northridge Earthquake, California passed a state law requiring the certification of all inspectors, plan checkers, and building officials. This was done to try and shore up the construction oversight of newly constructed buildings. Furthermore, a more recent state law requires all electricians to pass a state certification test (60% of the exam is based on the National Electric Code). These certifications involve a working knowledge of the appropriate codes.

The following information gives the enrollment numbers for the past 5 years for the Construction Technology Certification program, excluding the apprenticeship programs for ERBY, AGC, MITA, and Roofing:

	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04
Construction Total Attendance	405	491	523	498	496	520

The interest in the program has remained strong, and due to prudent classroom management, our average attendance figures are high. Attendance in each of the certificate/degree classes has averaged 34 per class for the school year (2002-2003) and 35 per class for the school year (2003-2004).

Trends

The construction industry is in the midst of a major transformation. The regional codes (ICBO – International Conference of Building Officials, BOCA - Building Officials and Code Administrators, and SBCCI – Southern Building Code Council International) are now being consolidated into one national code and code making body. The ICC – International Code Council is that agency and has published a family of International Construction Codes. Many states throughout the nation have now adopted these. California is in the process of considering these codes. When the State of California makes a determination, then all cities and counties will be mandated to adopt these codes. This will likely mean that most of the enforcement agencies, architects, designers, engineers, project managers, construction superintendents, and contractors will want to know the major changes between the current codes and the newly adopted codes. This will impact the Construction Technology program significantly. The only difficulty in forecasting this event is with the State of California. Because of the special interest groups, the decision for the adoption of the ICC codes could and has been delayed.

B. Internal Review

When the decision mentioned in the subsection above is made there will be a ripple effect in the industry. Knowing this, RCC is preparing for a variety of scenarios. The immediate emphasis is keeping our pool of prospective instructors current and continuing to advertise for new instructors by word of mouth. Secondly, to keep current with the changes, regular attendance at the ICC Citrus Belt Chapter is vital. Finally, communication with the student store on the changes in textbooks will be highly important. In the interim time, all the construction industry is designing, plan checking, building, and inspecting using the Uniform Codes as promulgated by ICBO. Because of this, our course offerings must reflect what industry is using.

The Roofing and Masonry programs are into their second and third cycles. It will be important to these industry partners that we continue to work with, support, and promote these classes. Reassigned time has been utilized in the past to help coordinate and communicate with these industry partners. Curriculum development and working to culminate these programs into a certificate pattern will be helpful for the overall health of each program. Administration will need to evaluate if reinstating reassigned time for the development of these two apprenticeship programs would be cost effective for this purpose.

Also, because a segment of the student population of the program is being “retooled”, it is important to have our curriculum set so that if necessary a student can complete the entire program in a 12-month timeframe. The course offerings are such that if students enroll in summer school, they can complete this 30-unit program in a single year. This, however, requires a rigid adherence to a particular curriculum pattern. [Because of the mandatory cut backs in the Spring of 2003, this now takes 1 ½ years].

C. Revised Vision/Summary

The Construction Technology Program has been growing and evolving. The numbers in the classes have steadily been increasing. The class rotation has been refined to provide a 1-year and a 2-year sequence for students wishing to complete the certificate pattern. All 13 of the certificate courses are offered at least once a year, with more sections being offered for those courses which are in high demand (UBC, Blueprint Reading, and the NEC). The response from our industry partners is very favorable regarding those who have completed our program. As a result, we have a very high rate of employment with the industry. According to the RCC Research department, the demand for workers in this field and in this geographic area is increasing (see Appendix B).

Topic III. What do we need to do to get there?

A. Initiatives, strategies, goals, and activities and B. Resources.

Giving consideration to the above projections, staffing and classroom availability are critical. Our current faculty members (both adjunct and fulltime) have been with the

college for a number of years and have done an excellent job of providing training for persons entering the industry. However, we must seek to help support and strengthen these faculty members. Furthermore, we will need to provide additional sections to keep up with the growing demand for our classes.

In the future a class in “Disaster Mitigation” which stems from the results of natural catastrophic hazards, such as fire, wind, or earthquakes appears to be needed. We also have regular questions about State Contractor’s License exams; therefore, perhaps a course in the legal requirements to satisfy the needs of this segment of the construction industry might be warranted. Additionally, we always have homeowners who are interested in a “Do-it-yourself” course. Our Construction 60 class is well suited for this and perhaps could be marketed to satisfy this need in the community.

Formalizing our articulation agreements with Cal Baptist and Cal Poly Pomona regarding the Construction program would be an immediate goal to help ease the transition of those students who wish to continue their educational journey.

Topic IV. What evidence do we need to track our progress?

Survey instruments like those used in the Dental Hygiene program for those students exiting the program and then taking the national certification exams would be helpful. This could be best used for our four core code classes (Construction 63-UBC, Construction 65-UPC, Construction 66-NEC, and Construction 67-UMC). This will need to be developed and implemented.

Since the program only offers one section of the Construction 68 (Simplified Engineering) per year, the success ratio of one question of the final exam analyzing a simple beam calculation could be used as an appropriate outcome assessment instrument. In the Construction 70 (Soils Technology) a similar approach could be used on the final exam for the classification of a soil sample.

With the four core code class national certification results and the two sample questions for the Construction 68 and 70 classes, six of the 13 classes would have measurable student outcomes. The other outcome measures for the other classes could be developed sometime in the future.

Topic V. How can we improve the discipline self-study process?

Disciplines with only one or two fulltime faculty have some special needs regarding the self-study process. Because of the demands of the discipline, adequate time and energy to compile and complete the Program Review Document is a major issue. For some who may not have adequate typing skills, clerical support maybe in order. Establishing realistic timelines with periodic meetings seems to help keep the momentum moving. The idea of a special orientation with all the necessary forms and the other departments

undergoing review is helpful for a variety of reasons (it adds a formal tone to it and helps the discipline to realize the more global aspects of the Program Review process).

Topic VI. Summary of Goals, Activities, and Findings