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Overview – Goals and Philosophy

Our goal as educators in the Architectural Design and Drafting Program is to educate students in the fast changing field of building design. Our specific goals for students fall into four broad categories:

- Providing complete education for students pursuing an Associates Degree, leading directly to work in the Building Design profession.
- Providing an introduction to the profession of Design and Architecture, for students to build basic skills in design, and develop a portfolio of creative work, for admission into a professional Architecture Program (B. Arch. or M. Arch).
- Providing a two year foundation study, for students to transfer to one of several Northwest universities who will place students in the third year of a professional Architecture Program (B. Arch).
- Providing specific courses for practicing professionals generally in the area of computer aided design and drafting (CADD) and building codes.

Our students pursue all of the options above; with about 80% opting for the Associates Degree. Our courses are designed to replicate experience required by employers in the building design field. This lends to courses that are outcome based, and thereby supportive of PCC’s goals.

Our faculty currently work in the field of architecture and building design. Specifically, faculty are engaged in residential and small commercial design, building inspections, and construction. Additionally, all faculty are involved in professional development activities, which include updates in computer aided design and drafting (CADD), evolving construction methods, and sustainable building issues.

The Architectural Design Program has grown noticeably over the last several years. The “Headcount”, as reported by “Enrollment Profile by Program”, has grown 62.6% from 1999/2000 to 2001/2002. It also will increased this year, as we have collaborated with the Interior Design Program to offer two new ARCH classes that are required for both Architecture and Interior Design students. The interaction between students of these two programs has had a positive impact on the evolution of student culture. A new student club (Sustainable Building Alliance) has emerged in response to growing student interest in environmental issues.

Additional future growth is pending in the form of an articulation agreement with Marylhurst University. They have a four year BFA program in Interior Design, with a number of courses similar to ours in architectural content. The Program Director and Co-Chair of the Program is reviewing a draft agreement, whereby Marylhurst students could take 6-8 of our courses, and transfer them to Marylhurst toward the BFA degree.
PORTLAND COMMUNITY COLLEGE
ARCHITECTURAL DESIGN AND DRAFTING
PROGRAM REVIEW – OUTCOMES AND ASSESSMENTS

1. To improve the quality of teaching and learning by asking faculty, staff, and administrators to reflect upon and examine teaching methodologies, learning outcomes, and curriculum.

   a. Evaluate the curriculum using national and/or professional program guidelines where available.

   Professional Architectural programs are accredited by the National Council for Architectural Registration Board (NCARB). Graduates of these programs are eligible to take the Architectural Licensing Exam. Our ARCH program covers the same general areas of study as these five-year programs. Subject areas include:

   • Design
   • Drawing/drafting
   • History + Theory
   • Building systems
   • Professional practices

   In Oregon, as in most states, building designers may design houses and small commercial buildings. A professional architect’s license is not needed for such projects. A building designer may voluntarily seek professional licensure by becoming a Certified Public Building Designer (CPBD). The National Council of Building Designer Certification (NCBDC) provides the licensure process and testing for this credential. (See Appendix A for information on NCBDC).

The NCBDC Objectives are stated as:

- To write, publish, administer and maintain an exam designed to test the applicant’s ability to meet the minimum requirements for professional building designer certification, as established by the Council.

- To delineate the minimum professional qualifications and performance standards for Certification as a Professional Building Designer.

To become a CPBD, one must:

- meet minimum standards for education and employment as a building designer; a total of 6 years (min. 20 hours per week) – with a maximum of two years as a student in college/university
- submit a sample of drawings, which meet established guidelines, for admission to the exam, and pass the exam
In response to this set of criteria, we have evaluated our program, and find our ARCH Program responds to the prerequisites of becoming a CPBD in the following manner:

1. Studios 1, 2, and 3 provide term projects similar to those required for construction document submittals for NCBDC, thereby providing valuable experience to enter the job market and begin the four years of work experience leading to eligibility for the CPBD exam.

2. Our subject matter courses include design, professional practice, drawing and drafting, structures, history, environmental control systems, sustainable building systems and materials, codes, construction, and detailing; thereby covering all of the subject groups covered on the exam.

Another method of evaluating curriculum is to examine the educational and professional goals of students. First year students have been tracked in each of the first year courses, since 2001. We have identified the following categories of goals:

<table>
<thead>
<tr>
<th>Education</th>
<th>Career</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAS degree</td>
<td>Certified Public Building Designer</td>
</tr>
<tr>
<td></td>
<td><em>PCC goal:</em> AAS degree</td>
</tr>
<tr>
<td>B.Arch or M.Arch</td>
<td>Licensed Architect</td>
</tr>
<tr>
<td>Transfer to University Of Oregon (UO)</td>
<td><em>PCC goal:</em> 4-6 ARCH courses to build portfolio</td>
</tr>
<tr>
<td>B.Arch</td>
<td>Licensed Architect</td>
</tr>
<tr>
<td>Transfer to Washington State University or University of Idaho</td>
<td><em>PCC goal:</em> transfer AAS degree to these schools and build portfolio for admission into professional program</td>
</tr>
</tbody>
</table>

We have determined that, while many transfer students express interest in UO due to its proximity to Portland, the UO will transfer only two or three of our courses into their architecture program. Our goal is to provide curriculum that supports creation of student work that can be developed into the required portfolio for admission. Our ARCH courses in design and CADD, along with some of the art classes are quite appropriate for this. During fall, 2002, we had a total of four students who have used our coursework to develop portfolios they have submitted to UO. There are additional students now this spring, or in the second year, who intend to transfer to UO, or another architecture program.

Several of our students have also transferred to the University of Idaho or Washington State University, where approximately 45 of the architecture credits have been accepted by the architecture program.
Another method ARCH faculty use to evaluate the curriculum is the comparison of our curriculum with that of Architecture programs at other community colleges around the country. We have compared our program with six others, and found that our subject areas, duration of program, and types of courses to be quite similar to those examples (see attached, Appendix B).

The ARCH Program also surveyed all students enrolled in any of the ARCH courses, during winter of 2002. The results are attached (see Appendix C). The survey shows that, overall, students are very satisfied with the Program. The two most frequent suggestions for improvement within the program are:
1) provide more evening classes
2) provide classes which transfer to 4 and 5 year architecture programs.

This year (2002/03), the ARCH Program scheduled all of our first year required classes at least once per year in the day, and once per year in the evening. As noted previously, most of our courses do transfer to University of Idaho and Washington State University.

b. Review and revise where necessary learning outcomes for the program and/or for any sequence of courses within the program.

Course sequences have been reviewed, and changes made during 2001-02 academic year. The end result was changes in a few prerequisites, addition of several new introductory and advanced level courses, and some changes in course content related to sequencing of information delivered to students.
Program Competencies for the program have been revised, and are attached; (see Appendix D).

Give evidence that the program learning outcomes are being met by the students.

Evidence that students are meeting the Program Outcomes is being developed:
• Co-op evaluation will be tied to program outcomes; thereby assessing program outcomes as applied to work setting.
• Plans are being developed to have Advisory Board members, or other members of the professional community, review Design Studio projects.

c. Describe how the courses in this program address the College Core Outcomes.

**Critical Thinking and Problem Solving**

Graduates of ADD are expected to be able to think critically and creatively, applying graphic solutions to design problems.

Students can:
• formulate ideas and consider spatial relationships, through graphic inquiry.
• move to a conclusion by using analytical thinking, and weighing options against user needs and site observation.
• develop solutions through evolution of graphic studies, design sketches and drawings.
• identify and define a building program through collection and analysis of information from a site interview along with client interview.

*Professional Competence*

Graduates of ADD are expected to demonstrate professional competence in design of buildings, through the application of industry standard design process, construction documents business practices, and use of technology.

Students can:
• use observational methods and skills to develop a program describing requirements for a specific building, and determining problems to be solved.
• Complete the design process as established by professional practice for building design
• apply appropriate technologies to analyze data relating to building systems; building codes, product literature, and research.
• use CADD for production of presentation and technical drawings, using established industry graphic standards.

*Communication*

Graduates of ADD are expected to be able to establish the purpose of communication, and respond with appropriate graphic and verbal solutions.

Students can:
• analyze technical information, related to building products and processes.
• apply knowledge of a particular building need, and produce written specifications for required products, using standards determined by the Construction Specifications Institute.
• deliver verbal and non-verbal messages that effectively describe the intent of a design solution.
• develop visual images capable of imparting images for design solutions responsive to the client program.

*Cultural Awareness*

Graduates of ADD are expected to be able to identify cultural perspective and values different from their own, as related to expression of cultural varieties in the built environment.

Students can:
• Identify cultural history and symbolism in the built form, and apply knowledge to appropriate responsive designs for living and working environments.
Community and Environmental Responsibility

Graduates of ADD are expected to comprehend the impact that the built environment has on the natural and social world.

Student can:
• identify and evaluate solutions responding to the negative environmental impact of the building process on the natural world.
• identify and evaluate solutions responding to the negative environmental impact of fuels used to operate building systems.
• identify the impact of the built environment on the social world; use knowledge to create positive environments that enhance social interaction.

Self Reflection

Graduates of ADD are expected to be able to evaluate their professional development.

Students can:
• appraise their skills and abilities.
• set well-defined goals and monitor progress.
• be protective of the safety of others, through implementation of life safety in building design.

2. To maintain instructional quality consistent with the academic standards of the Northwest Association of Schools and Colleges.

a. Assess the success of the program in contributing to the College mission.

1. The PCC ARCH program is the only complete two-year architectural program in the State of Oregon. All other community college programs have architecture as part of industrial and/or engineering drafting.

2. The ARCH program is very accessible to all students because all required first year classes are scheduled in both day and evening time slots. This allows students to take ARCH classes full-time and still maintain full-time or part-time employment. The ARCH program also supports part-time students.

3. Architectural Designers with Computer-Aided Design and Drafting (CADD) training are needed in the Portland Metropolitan area. The ARCH program is very affordable, as students are not required to purchase expensive sets of tools. Our CADD classes are also attended by practicing architects and designers, and many of the sections are offered at night and Saturday.
4. The majority of ARCH students are training for a second or third career. The ARCH program is able to combine previous career experience with new ARCH training to produce a very employable graduate. We also work with students to create “course challenges” for those with related work experience.

5. Students and faculty work closely together in the ARCH classes. Students are referred to our many Student Services when needed, to provide information and support related to financial, emotional, and academic concerns.

6. The ARCH program has maintained an active Advisory Committee and close ties to the architectural design community in the Portland metropolitan area for more than 30 years. During the academic year 2002-03, the Committee includes representation from Marylhurst University, Environmental Building Supply, and Neil Kelly Remodeling, along with various Professional Building Designers and Architects.

7. The program recognizes that the student body represents a wide variety of age, race, culture, and economic levels.

b. Report any changes the SACC has made to instructor qualifications and the reasons for the changes.

The ARCH program SACC has not changed program instructor qualifications recently. The SACC still requires all program full-time faculty to have a B. ARCH Degree, with a Masters Degree preferred. Currently, both full time ARCH faculty hold M. Arch degrees. Part-time faculty must have a minimum of an Associates Degree and 5 years experience in the area they are teaching. This requirement may be increased, depending on the needs dictated by the curriculum of the classes.

c. Describe how the students in this program are using the library or other outside the classroom information resources.

The PCC Library is highly recommended by program faculty as an information resource, and provides reserve copies (or "eBooks") of required textbooks. Other resources, such as the Math Tutoring Centers, Writing Labs and Office for Student Disabilities, are also highly recommended and used by ARCH students. As our classrooms now are all equipped with computers, students also use Internet resources extensively.
Other information resources include the following:

- field trips to construction sites, building materials showrooms, kitchen & bath showrooms
- on-site volunteer opportunities (non construction) are available at non-profit organizations such as The ReBuilding Center, and Habitat for Humanity
- field trips to visit architectural sites
- field trips to visit architectural and designer offices
- workshops with field experts, such as Portland Office of Sustainable Development, Lighting Lab at Portland University of Oregon site

3. Describe how the program is responding to the changing needs of students.

a. List the professional development activities of the faculty over the last three years and describe any instructional or curricular changes made as a result of those activities.

1. ARCH faculty have concentrated Professional Development in the following areas:

- Furthering expertise in CADD software, by attending specialty workshops and training sessions. Faculty adjust course curricula every year upon new releases of software.
- Furthering expertise in the architecture field by attending courses, workshops and training sessions, as required for Architect’s Licensure.
- Furthering expertise in energy efficient construction; by attending specialty workshops; resulting in new content in ARCH 124 and 224.
- Furthering expertise in use of environmentally sustainable building materials and systems, by attending lectures and workshops; resulting in new content in ARCH 124, 224, and 102 classes.
- Developing and expanding Service Learning, through collaboration with community partners offering learning opportunities to students, resulting in Service Learning options in ARCH 102, 124, 131, 200, and 224 classes. A Service Learning project in ARCH 131, winter 2002, brought a Service Learning Award to the class and Instructor.
- Creating an articulation program with Marylhurst University, providing for smooth transition for PCC students wishing to pursue a professional program leading to BFA degree in Interior Design, and for Marylhurst Interior Design students wishing to pursue an AAS Architecture degree at PCC. (Note: final agreement pending) (See appendix E)

2. ARCH faculty developed a Certificate program in Environmental Building Studies, to meet expressed interest of students in the program, and to keep current with emerging technology in this area (in process).
3. ARCH faculty developed an application with National Kitchen and Bath Association (NKBA), to establish PCC as a Certified Training Ground for students seeking the professional NKBA Certification (application in process).

b. Describe any significant shift in student demographics within your program and how that has impacted instruction.

Student surveys conducted by the ARCH program in winter 2003 show some changes from the last 5-7 years in student demographics. The program’s ethnicity has remained about the same, but the gender split is now approximately 35% women and 65% men. Some of this change is likely due to the fact that interior design students are now required to take two additional ARCH classes. Another change is in the distribution of student age groups, which is now about equally split between ages 20-25, 26-35, and over 35 years old. Only 9% of the ARCH students are ages 15-20, which is important when planning for student recruitment, as few of our students come directly from high school. Additionally, there are more students with the goal of transferring to a four or five year professional architecture program (30%). The ratio population of our minority and international students is about 20%, unchanged from 5-7 years ago.

c. Give examples of how feedback from students, business and industry, community groups, or institutions our students transfer to, was used to make curriculum or instructional changes.

Feedback from students in 2001, and from recent graduates, provided very useful information, and was used to make program changes (approved by Curriculum Committee February 2002). The ARCH program also relied on its Advisory Committee and employers of program graduates for input and review of proposed program changes. These changes were implemented beginning with the 2002-03 academic year.

A summary of program changes, as related to the needs of students:

- Graphics 1 and 2 was increased from two credits to three credits, and now meets twice weekly instead of once weekly; thereby providing more class time for students to work with instructors.
- Working Drawings 1 and 2 was increased from two credits to three credits, and now meets twice weekly instead of once weekly; thereby providing more class time for students to work with instructors.
- The requirement for Introduction to Drafting (from the Drafting Program) was deleted, and its content blended into Working Drawings 1 and 2, so architectural drafting could be emphasized.
- Introduction to Architecture was implemented as a required course, thereby bringing more design theory into the curriculum.
• Introduction to Building Systems was created as a new required course, which presents basic concepts and vocabulary of construction and building systems, thereby filling a gap for students new to the field.
• Advanced Building Systems was created as a new required course, which blends building systems with structural systems; thereby making appropriate applications between the two, and also providing course content in environmentally sustainable building materials and systems.
• Electives have been expanded to include selected Interior Design and Building Inspection courses.
• ST Room 240 has been remodeled, to include computers with Internet capacity and CADD programs, next to traditional drafting boards, thereby proving additional learning opportunities for first year students.

d. What strategies are used within the program to increase enrollment, improve student retention and student success.

Strategies used to increase enrollment:

1. Faculty visits to high school architecture/drafting classes (particularly those with PAVTEC agreements); attendance at College Career and Women in the Trades Fairs; providing videos and brochures to prospective students and interested groups.

2. Participation in the annual Products Fair, sponsored by the American Institute of Architects and Construction Specifications Institute, to increase public visibility.

3. Development of a student show, representing a variety of students projects from the ARCH program, which can be displayed at the Rock Creek and Cascade campus. This is an effort to attract students from these other campuses who are not familiar with the ARCH program (will begin 9/03).

4. Advertisement of several of our courses in various professional newsletters (such as AIA and NWSID Newsletters), to encourage attendance by practicing designers and architects who might want to enhance their professional information and skills.

5. Development of an articulation agreement with Marylhurst University, Interior Design Program, whereby their students could work concurrently with the ARCH program to either 1) transfer some of the ARCH courses to Marylhurst’s Interior Design Program, or 2) transfer some the Marylhurst courses to PCC to get an ARCH degree. (Articulation proposal has been presented to Marylhurst; decision pending).

7. Development of a Certificate program in Environmental Building Studies, to meet expressed interest of students in program, along with keeping current with emerging technology in this area (in process).

**Strategies to improve student retention & success:**

1. Faculty has increased their emphasis on meeting with all ARCH students for academic advising. Students are encouraged to contact faculty in class or during faculty office hours for counseling, class advising and/or tutoring. A follow-up initiative to contact students who fail to return a following term is needed.

2. Faculty refer students to math and writing center when needed to provide additional information and support, as needed for coursework.

3. Faculty encourage student study groups and peer tutors.

4. New courses provide basics in building concepts and vocabulary, for persons with no construction background; increasing foundation skills.

5. Five of the ARCH courses have been increased from two to three credits, and increased class time from once per week to twice per week to increase more class time to build skills & success.

6. New opportunities were created beginning in 2001 for Service Learning, which creates options for students to work in the community, in “hands-on” situations. This provides additional variety of learning style options.

7. Two new student clubs were created in 2002, to extend the student “learning community”.

**e. Report any changes made in the last three years to increase student access and diversity.**

1. The ARCH program has attempted to increase the number of women students in the program. The Interior Design Program now requires four of the architecture classes (ARCH 101, 102, 124 and 200), thereby increasing the number of women students in our classrooms, and exposed to architectural topics.

2. A primary goal of the proposed student shows at the Cascade and Rock Creek campuses is to attract more diversity to our program.
f. Identify any operational issues faced by the SACC that impact student Learning in your area, (e.g., facilities, availability of part time faculty and other needed resources).

1. Students must have access to current levels of program related software and hardware. Employers rely on PCC to provide training in the most current software programs. Employers also want to hire students with the highest levels of training and experience. Therefore, we need to continue to upgrade our software and hardware on a regular basis, as we have done to date.

2. Part-time faculty are relatively easy to find for evening classes. On the other hand, finding part-time faculty for daytime classes is very difficult, as most part-time faculty work during the day. Creating an additional pool of adjunct faculty, available to teach daytime classes is a priority.

3. Our program’s first year enrollments have been growing over the last few years, and we could fill additional sections; many of the current classes close the first week of registration. First year architecture and interior design students find it difficult to enroll in the ARCH classes they need for their program.

4. To assess that this professional technical program is adequately preparing students to enter into a career field.

   a. Evaluate the impact the advisory committee has on curriculum and instructional methods.

      The Advisory Committee has been very supportive of the program’s new curriculum and helpful with Cooperative Education placements. This year, two of the members have provided special evening tours of their facilities for class field trips. They have made comments on curriculum, which faculty have been able to integrate into the course content. Advisory Board members have also offered to involve themselves in an extensive workshop to evaluate student work, as related to Program Outcomes and industry standards. This workshop is tentatively scheduled for Fall, 2003.

   b. Review job placement statistics of students in your program over the last three years, including salary information where available.

      Specific job placement data are not available; however the ARCH program has identified this as a primary goal. Our plan is to collaborate with support staff and Institutional Research to establish a program to effectively track our graduates in the work force. Over the last 5+ years, students have been quite successful in
finding work in the Building Design industry. Most entry-level salaries appear to be around $25,000 per year with benefits. Many ARCH students are employed, at least part-time, before graduation. Program requirements for Cooperative Education encourage student employment during the student’s second year in the program.

c. Analyze the program learning outcomes, competencies, and skills as compared to the business and industry needs today and in the immediate future.

The ARCH program has recently developed Program Competencies (Appendix D). These competencies were developed to meet industry standards, and align with the National Council of Building Designer Certification’s exam. They have been reviewed and approved by our Advisory Board.

It is anticipated that future needs of the program will be related to ecological use of building materials and resources. In response to this, we have a) included information related to this in our course content, b) identified this as a priority for faculty professional development, and c) created a proposed certificate related to Environmental Building Studies.

d. Forecast future employment opportunities for students in your program.

State Employment data have two categories related to Building Designers – Architects and Drafters. Data are available for each of these, and are described in “Careers 2000” by the Oregon Employment Division, Jan., 2002. An Architect is defined as a person who “plans and designs structures such as private residences, office buildings, theaters, and factories”; requiring a 5 year degree and license. “Drafters” are defined as persons who “prepare working plans and detail drawings from rough or detailed sketches, or notes, for engineering or manufacturing purposes”; requiring some college education. This would include applications in engineering, industrial, and manufacturing settings. It is not clear exactly where building designers fit within these two areas, but are likely to be more closely related to Architects, in terms of employment outlook. In the past years, employment growth has been good for building designers/drafters, and the outlook for drafters is favorable. The publication “Employment Projections by Occupation 2000-2010”, from Oregon Employment Department, projects a 10.1% growth from 2000-2010. (See Appendix E for detailed information form Oregon Labor Market Information System). In terms of salary, an informal survey indicates that the ARCH graduates typically earn approximately $24,000 to $30,000 annually.
e. Analyze any barriers to degree or certificate completion that your students face and describe the main reasons students leave your program before program completion.

Student attrition comes typically in the following areas:
- student financial issues
- family issues, including moving from this geographic area
- child care issues

A few students leave the program after 4-5 terms, when they find full time employment related to the Architectural Design field. These "early-leavers" intend to return later to complete their degrees, and many do return and complete the degree. In fact, the program encourages students to seek and accept part-time employment to enhance their college training and improve their employment opportunities. This can change a full time student into a part time student.

5. To develop recommendations for improvement in the program.

a. Assess the strengths and areas in need of improvement in the program.

Strengths:
- Classroom resources: CADD, computer, drafting, library
- Out-of-the classroom resources
- Introductory courses, for those without construction or architecture background
- Courses that lead to work in the building design field, or transfer to a 5-year professional architecture program, or provide creative work for a portfolio for admission to 5-year programs
- Day and night course offerings
- Student clubs that increase community of learning
- Interior Design and Building Inspections program's collaboration at PCC

Areas in need of improvement:
- tracking of graduates
- Process of evaluating Program Learning Competencies
- Become a certified training ground for design specialties, including NKBA
- Specialization in Sustainable Building Design
- Recruit more minority students
- Build up pool of part time instructors, available during day hours
b. Given the above analysis and other findings of the SACC in this review process, prepare a set of recommendations that cover areas such as curriculum and professional development, recruitment and retention of students, obtaining needed resources, and being responsive to community needs.

The ARCH program areas in need of further work:

1. **Student Recruitment:**
   The program should increase recruitment, especially to attract women and minority students, along with construction workers looking for a career in the building trades.

   **Recommendation:**
   - The program must maintain contact with Vocational Rehabilitation Counselors to have recruitment access to injured construction workers.
   - The program needs to contact and work with local "women's resource groups" to reach women looking for a career change and/or a career in an architectural field.
   - The program must develop a student show for Rock Creek and Cascade Campuses to attract minority students.

2. **Student Retention:**
   The program needs to reduce student attrition. Studies indicate it is less expensive to reduce student attrition than to recruit new students.

   **Recommendation:**
   - Program staff must call students that fail to return following term.
   - Survey card can be used if phone calls fail.
   - Records need to be kept of reasons for students failing to return. Periodically, attrition records need to be reviewed to reduce attrition by eliminating preventable causes.

3. **Training Ground**
   Program would serve students better if we were part of a national certification program, such as those offered by the National Kitchen and Bath Designers, and also had an environmental specialization.

   **Recommendation:**
   - Program will collaborate with the Interior Design Program, to become a Certified Training Ground for Kitchen and Bath Designers with the National Kitchen and Bath Association.
• All faculty needs to initiate a process to save examples of student projects, as required for this Certification.

• Program will develop an Environmental Building Studies Certificate.

4. Develop body of student work for public presentations
There are a number of events which require presentation of student work examples, such as Products Fair, Women in the Trades show, and the upcoming First Thursday Shows “The Next Wave”. We need to have a broad range of student work examples.

Recommendation:
• All faculty begin a process to save examples of student projects.

• Student projects that are saved will also require written descriptions of building program, and summary of related research.

5. Need for more data:
Program assessments require valid data to be available. Data need to be collected from the College’s Institutional Research on students; however some students do not declare a major, and others do not have their current major declared.

Recommendation:
• The program needs to collaborate with the College’s Institutional Research for accurate information on ARCH students, with tracking of all students taking ARCH classes.

• The program needs to maintain the annual Departmental Student Surveys, including information related to: student background information, goals, previous experience, and work schedules. Results will be compared to previous years, and trends identified.

• The program needs to request current employment data from the State Employment Department on current outlooks and forecasts specifically for Building Designers.

• The program needs to request compilations of data from Cooperative Education/Job Placement on internship placements and job placements, with a breakdown on number of part-time and full-time placements.

• The program needs to track students who leave before completing their degree, to determine circumstances that lead to student prompted termination from the ARCH Program.
6. **Need for assessment of Adjunct Faculty:**
While full time faculty are reviewed and evaluated on a regular basis, per college standards, we do not routinely review adjunct faculty.

**Recommendation:**
- Develop an assessment of adjunct faculty, including classroom observation, and student reviews.

In summary, the Architectural Design and Drafting SACC and members of the advisory board were asked to review and provide responses to this document. With continued input from the faculty and advisory board, the ADD program will strive to provide the most effective education possible.
APPENDIX A:

National Council of Building Designer Certification Information
National Council of Building Designer Certification

The only Building Design Certification Program, to be nationally recognized, with a continuous history since the 1950's.

Credentials for the Discerning Professional
We administer the certification exam for Professional Building Designers and are currently contracted with two Professional Design Groups.
AIBD - The American Institute of Building Design - aibd.org
SPBD - The Society of Professional Building Designers - 1-800-284-2204

Certified Professional Building Designer (CPBD)
The certification mark, as used by authorized persons, certifies that, by testing, the person meets minimum requirements for Professional Building Design, and meets the professional qualifications and performance standards as dictated by the National Council of Building Design Certification.

NOCA Member
We are Organizational members of The National Organization for Competency Assurance. NOCA is the leader in setting quality standards for credentialing organizations.
(for more information) noca.org

Rural Housing Certification
The US Rural Housing Authority recognizes NCBDC certification.
Plans may be submitted to the Rural Housing Service bearing the certification seal.

4032 Hyde Park Drive
Chester, VA 23831
Local phone number: (804) 717-5451
Toll free number: (888) 726-7659
E-mail questions and requests to: information@ncbdc.com

Information about our organization is arranged by topic. Please select a topic from the left side of the screen and click.
Minimum Plan Standards

The National Council of Building Designer Certification suggests the following as a minimum standards guide for checking and evaluating plans. The information contained here-in is intended to establish minimum standards for light frame construction. All plans must also meet the requirements of all local building departments, as well as local and national codes that may be required.

PHILOSOPHY

Construction documentation (Plans and Specifications) should be provided so as to graphically convey the appropriate design requirements for a construction project. They should not, however, be interpreted as shop drawings as they do not indicate every consideration in absolute detail. They should sufficiently detail the construction requirements so as to provide information for permitting, contracting and construction. These requirements should not be repeated in both the drawings and specifications, as it could possibly increase the chances for error and/or contradictions.

The designer must assume the responsibility for the accuracy and thoroughness of their construction documentation. The lack of which most assuredly will result in a loss of time and/or money to either their client or the contractor. The quality of the designers work cannot be overemphasized. The drawings and lettering must be neat and accurate. There is absolutely no excuse for poor quality in the work.

The following indicates what documentation should be included in your submissions:

RESIDENTIAL

1. Site plan and details, project title, owner and address
2. Basement or foundation plans and details
3. Floor plans; special notes and room finish schedule
4. Window and door schedules
5. Exterior elevations
6. Sections; wall, footing, roof, etc.
7. Stair details
8. Cabinet details
9. Interior details
10. Floor and roof framing plan
11. HVAC plan and details
12. Electrical and Plumbing schedules

Note: Electrical and plumbing fixtures and switching are on floor plans

OTHER THAN RESIDENTIAL

1. Project title, address, owner, and drawing index
2. Site plan, soils analysis and site details
3. Floor plans, special notes and room finish schedule
4. Reflected ceiling plans
5. Roof plan and details
6. Exterior elevations
7. Sections; wall, roof, footing, etc.
8. Glazing details and schedule
9. Door details and schedule
10. Elevator and/or stair detail
11. Interior elevations and details
12. Millwork and cabinet details
13. Structural details; foundation, floor, wall, etc.
14. Electrical plans and schedule
15. Plumbing plans and schedule
16. HVAC plans and details
CONSTRUCTION DOCUMENTS

These should be accurately drawn to scale not less than as indicated below and should include all shading, cross hatching, and stippling as is considered acceptable by professional standards (Architectural Graphics Standards).

I. SITE PLANS:

Minimum Scale 1" = 20'

1. Show all lot lines, streets and north orientation.
2. Show all building lines, set backs and easements.
3. Locate structure, with dimensions, and show depth of front, rear and side yards.
4. Show all walks, drives, steps, decks, terraces, retaining walls, garages, and/or car ports.
5. Show existing and finish grade elevations at corners of structure with finished floor elevations, as required by code or owner.
6. Show existing grade elevations at all corners of lot, when required.
7. Show invert sewer elevation or septic tank location and layout of absorption field.
8. If private wells are involved, show location, and distance from absorption field, if applicable.
9. Show property drainage, as required by code or owner.

II. FOUNDATION PLAN:

Scale 1/4" = 1'-0" (In the event engineering data requirements have been waived, indicate the assumed conditions the system has been designed to accommodate as a footnote)

A. WOOD FLOOR

1. Provide complete dimensions (verify with floor plan).
2. Show size, direction and spacing of floor and band joists. Indicate where doubling is necessary.
3. Show location and size of all sills and/or girders.
4. Show location and size of all piers or pipe columns as well as footings and size.
5. Show location and size of all structural beams.
6. Show location and size of all foundation vents and access doors.
7. Show size, material and finish of foundation walls.

B. SLAB FLOOR

1. Provide complete dimensions (verify with floor plan)
2. Show slab thickness, type and thickness of fill, membrane vapor-proofing, welded wire mesh (size and gauge) or other appropriate reinforcing.
3. Show all grade beams, location, and size of reinforcing.

III. FLOOR PLANS: Scale 1/4" = 1'-0"

1. Appropriate and sufficient dimensions (verify with foundation plan)
2. Provide designation of all rooms and closets.
3. Show all garages, car ports, porches, decks, terraces, stoops and steps.
4. Show location, size, direction of swing and header requirement of all doors.
5. Show location, size and header requirement of all windows (Window and door sizes may be shown on separate schedule, if on same page as floor plan.)
6. Show location of all plumbing fixtures, to scale.
7. Show layout of all cabinets and vanities, book cases, wet bars and desks, including all appliances and venting.
8. Show all electrical fixtures, receptacles, switches, TV, phone, special purpose outlets, whole house fans, paddle fans, bath fans, and hood fans.
APPENDIX B:

Examples of Community College Architectural Design Programs
# Architecture - Architecture Technology

## Associate in Arts Degree

Associate Degree programs DO NOT necessarily constitute the first two years of a program leading to a bachelor's degree.

This program is designed to prepare students interested in obtaining employment as architectural technicians or transferring to schools of Architecture. The program has been developed through an advisory committee of architects, technicians, contractors, and Pierce College faculty. For General Education Subject Requirements, follow Plan B. If an eventual 4-year degree is considered, be aware of the requirements different from Plan B.

<table>
<thead>
<tr>
<th>FIRST SEMESTER</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arch 1 Introduction to Architecture</td>
<td>1</td>
</tr>
<tr>
<td>Arch 5 Architectural Drawing I</td>
<td>3</td>
</tr>
<tr>
<td>Arch 9 Elements of Architecture</td>
<td>3</td>
</tr>
<tr>
<td>Arch 20 Methods of Construction</td>
<td>2</td>
</tr>
<tr>
<td>Arch 41 Architectural Model Building</td>
<td>2</td>
</tr>
<tr>
<td>Math 145 Technical Mathematics I</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SECOND SEMESTER</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Arch 6 Architectural Drawing II</td>
<td>3</td>
</tr>
<tr>
<td>Arch 21 Materials of Construction</td>
<td>3</td>
</tr>
<tr>
<td>Arch 33 Basic Architectural Design I</td>
<td>3</td>
</tr>
<tr>
<td>Math 146 Technical Mathematics II</td>
<td>3</td>
</tr>
<tr>
<td>General Education</td>
<td>3</td>
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<table>
<thead>
<tr>
<th>THIRD SEMESTER</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Arch 7 Architectural Drawing III</td>
<td>3</td>
</tr>
<tr>
<td>Arch 22 Equipment of Buildings</td>
<td>3</td>
</tr>
<tr>
<td>Arch 34 Basic Architectural Design II</td>
<td>3</td>
</tr>
</tbody>
</table>

http://www.lapc.cc.ca.us/usr/updates/associate/Programs/Architec.html

3/6/2003
<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>English 28</td>
<td>Intermediate Reading and Composition</td>
<td>3</td>
</tr>
<tr>
<td>Or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>English 101</td>
<td>College Reading and Composition I</td>
<td>3</td>
</tr>
<tr>
<td>1</td>
<td>Architectural Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

**FOURTH SEMESTER**

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arch 8</td>
<td>Architectural Drawing IV</td>
<td>3</td>
</tr>
<tr>
<td>Arch 10</td>
<td>Freehand Drawing I</td>
<td>2</td>
</tr>
<tr>
<td>Arch 12</td>
<td>Architectural Rendering</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Art Elective</td>
<td>3</td>
</tr>
<tr>
<td>Health 10</td>
<td>Health Education</td>
<td>2</td>
</tr>
<tr>
<td>Phys Ed</td>
<td>Physical Education Activity</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>General Education</td>
<td>6</td>
</tr>
</tbody>
</table>


2. Math 116 or 115 or Math 125 may be substituted.

3. Math 240 may be substituted.


**Note:** CA State Polytechnic Universities, San Luis Obispo and Pomona offer degrees in Architecture and Planning. See a counselor or department advisor for further information.
Woodbury Transfer Track

Woodbury University is a fully accredited private university with a satellite campus in San Diego. Students who maintain a 3.0 average in all San Diego Mesa College architecture design studies qualify for automatic transfer to Woodbury's third year design studio (Design Studio 5) without portfolio review. Students who successfully complete (2.0 or better) all Woodbury transfer track courses but do not meet the required design studio average of 3.0 will require portfolio review to achieve third year design studio placement. See department chair for more information.

<table>
<thead>
<tr>
<th>Courses</th>
<th>Units</th>
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<tbody>
<tr>
<td>ARCH 101, Computer Aided Drawing and 3D Imaging</td>
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</tr>
<tr>
<td>ARCH 111 Architecture Production Detailing</td>
<td>4</td>
</tr>
<tr>
<td>ARCH 126 History of the Ancient World Architecture</td>
<td>3</td>
</tr>
<tr>
<td>ARCH 127 History of World Architecture: Romanesque through Contemporary</td>
<td>3</td>
</tr>
<tr>
<td>ARCH 130 Materials of Construction</td>
<td>3</td>
</tr>
<tr>
<td>ARCH 170 Architectural Design</td>
<td>4</td>
</tr>
<tr>
<td>ARCH 175 Advanced Architectural Design I</td>
<td>5</td>
</tr>
<tr>
<td>ARCH 180 Advanced Architectural Design II</td>
<td>5</td>
</tr>
<tr>
<td>ARCH 185 Environmental Design I, Creating Exterior Spaces</td>
<td>5</td>
</tr>
<tr>
<td>ARCH 220 Architectural Delineation I</td>
<td>2</td>
</tr>
<tr>
<td>ARCH 226 Architectural Theory</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Units = 40*

*Plus additional Units
# NVCC 2002-2003 Catalog

## Instructional Programs

## ARCHITECTURE TECHNOLOGY

Associate in Applied Science Degree AL, AN

Purpose: The Architecture curriculum is designed to prepare students for employment. The program also prepares students to continue their education at undergraduate and graduate levels at local universities. Students must see their architecture advisor to satisfy individual goals. The graduates will find employment in the field of architecture, construction, and urban design utilizing their construction knowledge, graphic communication, and problem solving skills.

Recommended Preparation: Two years of high school algebra and geometry.

<table>
<thead>
<tr>
<th>First Year</th>
<th>1st Semester</th>
<th>2nd Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARC 121</td>
<td>Architectural Drafting I</td>
<td>3</td>
</tr>
<tr>
<td>ARC 133</td>
<td>Construction Methodology &amp; Procedures I</td>
<td>3</td>
</tr>
<tr>
<td>ARC 200</td>
<td>History of Architecture</td>
<td>4</td>
</tr>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>DRF 201</td>
<td>Computer Aided Drafting and Design I</td>
<td>4</td>
</tr>
<tr>
<td>STD</td>
<td>Elective</td>
<td>1</td>
</tr>
<tr>
<td>ARC 122</td>
<td>Architectural Drafting II</td>
<td>3</td>
</tr>
<tr>
<td>ARC 134</td>
<td>Construction Methodology &amp; Procedures II</td>
<td>3</td>
</tr>
<tr>
<td>ARC 138</td>
<td>Structures for Architects</td>
<td>3</td>
</tr>
<tr>
<td>ARC 201</td>
<td>Modern Architecture</td>
<td>2</td>
</tr>
<tr>
<td>ARC 225</td>
<td>Site Planning</td>
<td>3</td>
</tr>
<tr>
<td>MTH 115</td>
<td>Technical Math I</td>
<td>3</td>
</tr>
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</table>

| Total Credits/Semester | 18 | 17 |

<table>
<thead>
<tr>
<th>Second Year</th>
<th>1st Semester</th>
<th>2nd Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARC 231</td>
<td>Adv. Arch. Design &amp; Drafting I</td>
<td>4</td>
</tr>
<tr>
<td>ARC 243</td>
<td>Environmental Systems</td>
<td>4</td>
</tr>
<tr>
<td>DRF 202</td>
<td>Computer Aided Drafting &amp; Design II</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Technical Elective</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>Social Science Elective</td>
<td>3</td>
</tr>
<tr>
<td>PED 116</td>
<td>Lifetime Fitness and Wellness</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Elective</td>
<td>1</td>
</tr>
<tr>
<td>PED 116</td>
<td>Social Science Elective</td>
<td>3</td>
</tr>
<tr>
<td>SPD 110</td>
<td>Intro. to Speech Communications</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>Technical Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

| Total Credits/Semester | 18 | 15 |

Total credits for the A.A.S. Degree in Architecture Technology = 68.

http://www.nvcc.edu/catalog/cat2002/programs/arctec.htm

3/6/2003
### 4-term Suggested Course Sequence for Carol Davis

Date: March 06, 2003

Shown Below is a 3-term course sequence within Architectural Design and Drafting that has been provided for Carol Davis. Individuals who participate in this schedule of course offerings, and successfully pass each class in this distribution ("C" letter grade or better), are considered candidates for placement within residential drafting occupations.

#### Spring Term 2003
- Arch 111  Working Drawings 1  
- Arch 137  AutoCAD Arch. Desktop  
- Arch 132  Building Codes  
- Arch 101  Graphics 1  

**Term Total: 12 Credits**

#### Summer Term 2003
- ARCH 124  Intro to Building Systems  
- ARCH 200  Intro to Architecture  
- ARCH 113  Working Drawings 3  
- Math (if needed to meet prerequisites) or Physics 101  

**Term Total: 14 Credits**

#### Fall Term 2003
- ARCH 122  Structural Systems 2  
- ARCH 201  Design Studio 1  
- ARCH 224  Advanced Building Systems  

**Term Total: 16 Credits**

#### Winter Term 2003
- ARCH 280  Co-op Ed. Drafting  
- ARCH 280  Co-op Ed. Job Observation  
- ARCH Elective (From approved list)  
- ARCH 123  Structural Systems 3  
- CG 209  Job Finding Skills  

**Term Total: 14 Credits**

Elizabeth A. Metcalf, Instructor
Architectural Design and Drafting, Portland Community College
(503) 977-4170
etcalf@pcc.edu
2002-2003 CR College Catalog

Course Offerings
Degree and Certificate Programs
Registration Information

Course Listings
Search Class Listings
Addiction Studies
Agriculture
Administration of Justice
Anthropology
Aquaculture
Art
Astronomy
Automotive Technology
Biology
Business
Chemistry
Cinema
Computer and Electronic Technology
Computer Information Systems
Cooperative Education
Court Reporting
Construction Technology
Dance
Dental Assisting
Diesel Heavy Equipment Technology

Career Options
This program is designed to prepare students for an entry level position as an architectural drafter. Employment positions may include detailer, drafting technician, engineering assistant, plan checker, illustrator, designer, CAD technician, animator, and 3-D modeler.

Related Links
Department Homepage
Degrees / Certificates Offered
Associate of Science Degree, Architecture
Eureka
Associate of Science Degree, Civil Design
Eureka
Associate of Science Degree, Mechanical
Eureka
Catalog Class Listing
Schedule of Classes

A.S. DEGREE REQUIREMENTS

Major 56.5

Additional A.S. General Education 3.5

Total Units 60.0

Notes: Students majoring in this field, and those considering transfer to a four-year institution, must contact the occupational advisor in the Applied Technology building for additional information and planning assistance. Call (707) 476-4340.

Drafting Technology
Associate of Science Degree, Architecture

MAJOR REQUIREMENTS: 56.5 Units

REQUIRED COURSES: 56.5 Units

DEPT. & NO. COURSE TITLE UNITS
* ART 17 Drawing 3.0
+ CT 50 Construction Estimating 4.0
+ CT 70 Building Codes and Standards 2.0
+ CT 72 Electrical Codes and Standards 2.0
+ CT 80 Carpentry Theory I 3.0
+ CT 81 Carpentry Theory II 3.0
+ # DT 25 CADD Fundamentals 4.0
Certificate Program

For students who wish to complete two classes (minimum) in one year to prepare for employment. A minimum of 37 units is required. Cannot be completed in one academic year.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arch 1</td>
<td>Introduction to Architecture</td>
<td>1</td>
</tr>
<tr>
<td>Arch 5</td>
<td>Architectural Drawing I</td>
<td>3</td>
</tr>
<tr>
<td>Arch 6</td>
<td>Architectural Drawing II</td>
<td>3</td>
</tr>
<tr>
<td>Arch 7</td>
<td>Architectural Drawing III</td>
<td>3</td>
</tr>
<tr>
<td>Arch 8</td>
<td>Architectural Drawing IV</td>
<td>3</td>
</tr>
<tr>
<td>Arch 10</td>
<td>Freehand Drawing I</td>
<td>2</td>
</tr>
<tr>
<td>Arch 12</td>
<td>Architectural Rendering</td>
<td>2</td>
</tr>
<tr>
<td>Arch 20</td>
<td>Methods of Construction</td>
<td>2</td>
</tr>
<tr>
<td>Arch 21</td>
<td>Materials of Construction</td>
<td>3</td>
</tr>
<tr>
<td>Arch 22</td>
<td>Equipment of Buildings</td>
<td>3</td>
</tr>
<tr>
<td>Arch 33</td>
<td>Basic Architectural Design I</td>
<td>3</td>
</tr>
<tr>
<td>Arch 34</td>
<td>Basic Architectural Design II</td>
<td>3</td>
</tr>
<tr>
<td>Arch 41</td>
<td>Architectural Model Building</td>
<td>2</td>
</tr>
<tr>
<td>Math 146</td>
<td>Technical Mathematics II</td>
<td>3</td>
</tr>
</tbody>
</table>
The Vital Signs Project: Architecture and Energy Use

The Vital Signs Curriculum Materials Project examines the physical performance of buildings, their patterns of energy use, and their impact upon occupant well being. The project's goal is to encourage the next generation of architects to build environmentally responsible and energy efficient buildings, by promoting a pedagogic approach that provides opportunities for experiential learning. The project has produced background material, procedures and guidelines to support student investigation using existing buildings as study sites. Vital Signs has also begun an internet site that serves as a center for the electronic distribution of Vital Signs materials and student case studies of existing buildings. The project receives general support from The Energy Foundation and Pacific Gas & Electric. Specific project activities have been supported The National Science Foundation, The Nathan Cummings Foundation, The Educational Foundation of America, and the US Department of Energy. The project's primary audience is architecture students and faculty. However, dissemination of information about well-known buildings, gathered in the course of student investigations, has the potential to influence a larger audience throughout the building professions.

Targeting architects for education about energy and the environment is especially important because, whether aware of it or not, they play a central role in shaping the nation's future in these areas. With lifespans of decades or even centuries, buildings are among the most lasting objects we produce. They account for more than one-third of national energy use and over sixty percent of national electricity consumption. Buildings in the United States alone account for almost 10% of global energy use. They also serve as models for much of the new construction in the developing world. A quick sketch or clay model made by an architect in the earliest stages of design can affect building energy consumption well into the future. A thoughtless decision about building orientation may create a cooling load that lasts as much as a century. Decisions about the extent and type of glazing in a commercial or institutional building will affect power use for thousands of business days.

The link between poor design decisions and global environmental problems is a strong one. Coal-fired electric power production is a primary source of acid rain. The carbon dioxide that results from the burning of fossil fuels is a major factor in global warming. The demand for more power, and the accompanying need for new power plants, new large scale dams, and new oil exploration and mining sites, all contribute to habitat destruction.

In design scheming a number of goals must be considered and balanced. These usually include economics, aesthetics, and spatial quality. All too often, however, energy issues and occupant health and well-being are not among the primary concerns. Many architects see energy considerations as something to be handed off and

http://arch.ced.berkeley.edu/vitalsigns/brief/vs1.html
The protocols included in each Resource Package enable students to learn through observation, survey, interviews and direct measurement. As with the rest of the Resource Package, these protocols are intended to be adaptable to a number of student and faculty needs. For this reason, exercises and measurement techniques are typically organized at three different levels. The first level presumes a single building visit and involves observations, interviews, and survey techniques. Limited instrumentation, or none at all, is employed. This might be appropriate as a studio programming exercise or as part of a survey course. The second level usually involves more than one visit and may require simple instrumentation. The data gathered can be compared to relatively simple simulation techniques assisting students in understanding the strengths and weaknesses of abstract building performance prediction methods. This would be appropriate to a seminar setting or as a lab assignment in a lecture class. The third level involves study over longer periods of time and may employ more complex data acquisition systems. Level three exercises typically add time series data collection to the procedures in the previous levels. This would be appropriate as an independent project or graduate level work.

The protocols included in the Resource Packages are not intended to be all inclusive. Architectural educators and interested students are encouraged to develop their own exercises on the topics covered in the Vital Signs Resource Packages or on others of their own choosing.
Architecture Certificate

The Architecture Certificate Program is designed for students who wish to concentrate solely on technically-related courses. Graduates are prepared for entry-level positions with architectural or construction companies.

<table>
<thead>
<tr>
<th>Semester One</th>
<th>Course Number</th>
<th>Course name</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARC 110</td>
<td>Wood and Masonry Construction Technology (prerequisite: ARC109 or concurrent enrollment or high school drafting)</td>
<td>5</td>
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<tr>
<td>COT101</td>
<td>Introduction to Architecture, Engineering and Construction</td>
<td>1</td>
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<tr>
<td>ARC 187</td>
<td>Fundamentals of Architectural Drawing and Models (prerequisite: ARC109, or concurrent enrollment, or high school drafting)</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>ARC 112</td>
<td>Materials of Construction</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>ARC189</td>
<td>Introduction to Architectural CAD</td>
<td>3</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Semester Two</th>
<th>Course Number</th>
<th>Course name</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARC 120</td>
<td>Steel Construction Technology (prerequisite: ARC109 or concurrent enrollment or high school drafting and ARC110 or concurrent enrollment)</td>
<td>5</td>
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<td>COT258</td>
<td>Construction Cost Estimating</td>
<td>3</td>
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<td>COT142</td>
<td>Contract Documents</td>
<td>3</td>
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<tr>
<td>TEC 143</td>
<td>Technical Mathematics I</td>
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<tr>
<td>MKT200</td>
<td>Developing the Professional Image</td>
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<table>
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<tr>
<td>ARC130</td>
<td>Concrete Construction Technology (prerequisite: ARC109 or concurrent enrollment or high school drafting)</td>
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<td></td>
</tr>
<tr>
<td>Course</td>
<td>Description</td>
<td>Credits</td>
<td></td>
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<tr>
<td>----------</td>
<td>-----------------------------------------------------------------------------</td>
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<tr>
<td>ARC260</td>
<td>Advanced Architectural CAD</td>
<td>3</td>
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<tr>
<td>ARC 199</td>
<td>Internship</td>
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<tr>
<td>ARC 140</td>
<td>MEP Construction Technology (prerequisite: ARC109 or concurrent enrollment or high school drafting and ARC110 or concurrent enrollment)</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

Total credits required for graduation: 49
APPENDIX C:

PCC Student Survey Summary (Winter 2003)
Architectural Design and Drafting
Student Survey

1. What is your primary reason for attending PCC?
   a. Seeking a 2 year Associate degree. 54
   b. Take classes that would transfer to a four year college. 30
   c. Take classes for personal interest. 12
   d. Prepare for a new career. 31
   e. Upgrade skills to keep current job or get a better job. 11
   f. Other, specify 10
      • Need for Degree @ Maryhurst (2)
      • Obtain skills to operate bldg. design gen.contractor co.
      • Find the way of my future studies
      • AutoCAD
      • Knowledge for running my own business
      • I'm wanted by the FBI & either I go to college or the military

2. How did you find out about the ARCH program at PCC?
   a. High school contact. 7
   b. PCC schedule 75
   c. Advertisement, if so, where? 0
   d. Business contact. 1
   e. Other 28
      • Voc. Rehab
      • Friend
      • Walk in
      • Internet
      • Guide @Humbolt State U. Library
      • VA Rep.
      • PCC Advisor
      • Maryhurst University
      • Previous classes at PCC
      • Research & interview School
      • My judge
      • Building Codes Dept.
      • Because of AutoCAD reputation
3. Are you currently working? (Check all that apply.)
   a. full-time 38
   b. part-time 37
   c. days 19
   d. evenings 8
   e. unemployed 24
   f. self-employed 9
   g. flexible hours 11

If employed, what type of work?
   • Delivery (2 days week) Computer Tech
   • Retail Hauling/Landscape Maintenance
   • UPS Work Study
   • CAD drafting Logistics
   • Cabinet Server
   • Counselor advisor/PCC Sales Associate
   • Interior Design Design Consultant @ furniture store
   • Dental Hygienist Sell bags to stores
   • Drug & Alcohol Rehab Architectural Drafter/Intern
   • Building Rehabilitation Micro Electronics (Fab Tech)
   • Admin. Assistant Engineering
   • Buyer/Retail Counter top Installer
   • Internship Waitress
   • Design remodeling Telecom Analyst/Consultant
   • Medical clinic I sell things
   • Deliver Oregonian Technical Support (Xerox)
   • Investor Customer Service
   • FedEx package handler Medical Office
   • Interior Designer Finance/Intel Corp.
   • Ergonomics Consultant (DCBS)

4. Class scheduling / enrollment
   a. attending daytime classes 75
   b. attending evening classes 70
   c. attending weekend classes 8
   a. hours per week 3(x4) 4(x4) 5.5(x3) 6(x5) 7(x2) 8(x2) 9(X7) 10(x4) 11
   b. hours per week 2 3(x4) 4(x18) 5(x2) 6(x7) 7(x8) 8(x2) 10(x2) 13(x2) 14
   15 16(x2) 35(2)
   c. tele-course/distance learning 5
5. Work experience in the architectural/drafting field?
   a. Yes 21
   b. No 83

   (Briefly describe)
   - Residential remodeling plans for self employed architect.
   - Contractor/estimator, owned custom cabinet shop, designed homes & interiors
   - Design own rehab projects
   - Remodel of 1915 house (drew possible designs)
   - Pro-E work related only
   - Architectural/Interior design
   - Father is owner/operator of small general contracting co.
   - Some from my neighbor
   - Work at Tektronix CAD Dept.
   - Short internship at one person architecture/design firm
   - Secretary in Civil Engineering Firm
   - Drafting for the Port of Portland
   - Arch/Drf internship
   - Father is a carpenter and contractor (learned from him)
   - Designed decks
   - I've worked in interior design 12 years, mostly new construction the past 8 years.
   - Construction worker for 4 years.
   - 3 years in offices 198-83 various remodels & independent work.

6. Work experience in the construction field?
   a. Yes 40
   b. No 63

   (Briefly describe)
   - Limited general on 2 projects
   - Helped some with remodel
   - Self employed finish carpenter
   - Worked for small construction/remodeling company
   - Cabinets
   - Union floor mechanic, kit & bath remodel, dry rot repair, handyman repairs
   - Contractor/estimator, cabinet maker, journeyman carpenter
   - Remodeling own homes, rentals
   - Summer job 25 years ago during college
   - Remodeling
• Laborer for independent contractor res. & comm.
• Roofing, some remodeling
• Remodel of 1915 house (tore out old and built new walls, ceilings)
• Construction administration
• Carpentry and concrete casting
• Habitat for Humanity
• Assisted residential appraisal – worked for D.O.T. – City of Oregon City & Clack. County long range planning Homebuilders Assoc.
• Assisted Husband in general contracting new homes and some historic renovations
• Some implied info
• Various home remodel projects.
• Framing
• High School Tech.
• 20 years as a cabinet maker – reading blueprints
• During high school, built bldgs. on our campus
• Worked as intern for the Port of Portland out at the PDX Airport
• My father is a residential contractor, I grew up building houses, garages etc.
• Managed tenant improvement projects
• Built decks
• Foundations, roofs, remodeling, home rebuilding & designing etc.
• Land surveyor 3+ years
• Brief construction job after high school
• Summer jobs
• Construction worker for 4 years
• Wood frame – remodels – landscape

7. Do you have computer experience?
   a. Yes
   b. No

   Do you have a computer at home?
   a. Yes
   b. No

   Do you have a computer at work?
   a. Yes
   b. No
8. Age
   a. 15-20  
   b. 21-25  
   c. 26-30  
   d. 30-35  
   e. 35 & up

9. Your suggestions on how to improve the program?
   - AutoCAD @ Cascade Campus would be very helpful/other ARCH @ Cascade.
   - It's all good
   - Certain classes could be taught more than once a year
   - More classes more lab time, good well educated lab. Assistances
   - Relocate program to central location
   - Open some classes from 8:00 am
   - Upgrade to enable transferring credits to U of O
   - Excellent program, many possibilities for one-on-one with teachers, good emphasis on work experience.
   - More hand drafting, more variety of computer aided drafting software
   - More evening classes for working individuals, extra computer assistance – tutors
   - I think it would be helpful to have classes earlier than 8am & the evening courses should be offered shorter time, but held more often in a week, like the day classes.
   - Nothing
   - More evening classes and more classes w/AutoCAD
   - Schedule the classes closer together so they don’t take so much of the day
   - Haven’t been here long enough to suggest improvements
   - So far so good
   - Include classes on sustainable building, passive/solar design, how to read sun charts & wind data
   - Have credits and associates transfer to more schools
   - More daytime classes, partnership programs w/ local Arch. Firms
   - I would like to see more AutoCAD at PCC
   - Offer more classes that would transfer to the PSU architecture program
   - More transferable Arch. Classes
   - More transfer to 4 year program classes
   - Cheaper access to programs
   - Make the Arch program transferable to a 4 year college
   - Offer scheduled independent questions for Architectural students having problem in an area – such as with math & English (2nd language)
- Have students use Zip disks instead of floppy – more input as to when, who, how much the stuff we learn is actually use in the "real world"
- Possibly more T.As in labs
- Offer more night classes
- Having classes either first thing in the morning (8:00am) or evening (6:00pm) helps working students immensely! The mid-day only classes are near impossible for working students.
- Lower prices
- Expand use & application of computers in class work, beyond just AutoCAD. Example- use of spreadsheets for structural calcs.
- I would like to see an Arch/Drf certificate that a working person could earn in 2 years. I don't need the Gen. Ed. Classes
- More structural engineering
- Make it transferable to local universities
- More night classes available
- More night classes
- More computer
- Provide more classes that are transferable to more 4 year colleges.
- Offer Macintosh & "ArchiCAD" a much simpler application – cross platform (accepts DWG files)
- Revit or ArchiCAD instead of ADT or Chief.
- Everyone needs more practice drawing w/ARCH. Desktop, seems to me AutoCAD can be much better as a skill on a resume.
APPENDIX D:

PCC Architectural Design and Drafting Program Competencies
Program Competencies

- Develop program for a particular client and user, resulting from appropriate research
- Analyze site for physical characteristics & zoning issues
- Design house, and small commercial building, in response to program & site analysis
- Analyze a building for compliance to residential or commercial codes
- Become familiar with, and make application of, basic spatial design concepts
- Apply knowledge of construction and structures to the production of working drawings, using NCBDC standards (see Appendix A), for residential, small commercial, and remodel applications; including plans, elevations, sections, details, and schedules
- Apply knowledge of heating, lighting, and plumbing systems to the design of schematic HVAC, plumbing, and lighting plans for residential, small commercial, and remodel examples.
- Demonstrate understanding of heat loss/gain, daylighting, energy conservation through written and graphic analysis of a building design
- Apply knowledge of passive technologies to design of schematic applications for passive solar heating, natural cooling, and water conservation
- Apply knowledge of construction and industry standards, to set of construction documents, so as to graphically convey appropriate design requirements for construction project
- Demonstrate understanding and application of ethics practices, as related to building industry standards, and NCBDC Code of Ethics and Bylaws.
- Demonstrate understanding of materials used in construction, including their sizes, composition, advantages/disadvantages, and appropriate applications
- Demonstrate ability to identify major styles of architecture in American residential design, along with some internationally know architectural works.
- Demonstrate an understanding of the terminology and essential principles of structural design
- Ability to size structural members in wood typical light frame construction, using calculation and reference manuals.
- Demonstrate basic understanding of professional building practice, including understanding of Contracts, Change Orders, Addenda.
- Demonstrate understanding of Specifications, through development of written specification, using CSI format
- Demonstrate ability to use sketching and graphic analysis to explore design options.
- Demonstrate ability to make a professional presentation graphically and verbally.
- Demonstrate ability to create architectural drawings using Architectural Desktop, or other CAD program
- Demonstrate skills in developing perspective drawings, and in indicating surface features using shading and/or color
APPENDIX E:

Proposed Articulation: Marylhurst University
## Proposed Articulation: Marylhurst University and Portland Community College

**BA and BFA Interior Design Students**

<table>
<thead>
<tr>
<th>PCC Required course</th>
<th>Marylhurst Equiv. or elective</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCH 111 Working drawings 1 (House)</td>
<td>Construction documents</td>
</tr>
<tr>
<td>ARCH 124 Intro Building Systems</td>
<td>Structures &amp; Bld. Systems</td>
</tr>
<tr>
<td>ARCH 126 Intro to AutoCAD</td>
<td>Intro to CAD</td>
</tr>
<tr>
<td>ARCH 200 Introduction to Architecture</td>
<td>Studio 1</td>
</tr>
<tr>
<td>ARCH 101 Architectural Graphics 1 (House Design)</td>
<td>Studio 3</td>
</tr>
<tr>
<td>ARCH 136 Intermediate AutoCAD</td>
<td>Intermediate AutoCAD</td>
</tr>
<tr>
<td>ARCH 224 Adv. Building Systems</td>
<td>Elective</td>
</tr>
<tr>
<td>ARCH 203 Design Studio 3</td>
<td>Elective (6 cr)</td>
</tr>
<tr>
<td>ARCH 132 Building Codes</td>
<td>elective</td>
</tr>
</tbody>
</table>
### Proposed Associate of Applied Science Degree

**Architectural Design & Drafting**

Articulation for BA and BFA Interior Design Students

<table>
<thead>
<tr>
<th>PCC Required course</th>
<th>Marylhurst Equiv. or waiver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working drawings 1 (House)</td>
<td>Construction documents</td>
</tr>
<tr>
<td>Intro Building Systems</td>
<td>Structures &amp; Bld. Systems</td>
</tr>
<tr>
<td>Intro to AutoCAD</td>
<td>Intro to CAD</td>
</tr>
<tr>
<td>Introduction to Architecture</td>
<td>Studio 1</td>
</tr>
<tr>
<td>Architectural Graphics 1 (House Design)</td>
<td>Studio 3</td>
</tr>
<tr>
<td>Working Drawings 2 (Commercial)</td>
<td>Construction documents (for comm. ID)</td>
</tr>
<tr>
<td>Building Codes</td>
<td>Need to take (3 cr)</td>
</tr>
<tr>
<td>Intermediate AutoCAD</td>
<td>Intermediate AutoCAD</td>
</tr>
<tr>
<td>Physics</td>
<td>Waive (have many credits in science)</td>
</tr>
<tr>
<td>Architectural graphics 2 (Comm. Design)</td>
<td>Studio 7-9 (comm.. tenant plan; 9 cr.)</td>
</tr>
<tr>
<td>Working Drawings 3</td>
<td>Waive</td>
</tr>
<tr>
<td>Structural Systems 2</td>
<td>Need to take (4 cr)</td>
</tr>
<tr>
<td>Adv. Architectural AutoCAD</td>
<td>??</td>
</tr>
<tr>
<td>Adv. Building Systems</td>
<td>Need to take (4)</td>
</tr>
<tr>
<td>Structural Systems 3</td>
<td>??</td>
</tr>
<tr>
<td>Design Studio 1 (House)</td>
<td>Need to take (8)</td>
</tr>
<tr>
<td>Intro Art</td>
<td>Art history</td>
</tr>
<tr>
<td>Design Studio 2</td>
<td>Studios 7-9 ? or customize current for ID?</td>
</tr>
<tr>
<td>CE: Arch. Design &amp; Drafting</td>
<td>Waive</td>
</tr>
<tr>
<td>Design Studio 3</td>
<td>Need to take (6 cr)</td>
</tr>
<tr>
<td>Job Finding Skills</td>
<td>Waive</td>
</tr>
</tbody>
</table>

25 credits (33 w/ studio 2)
APPENDIX F:

Oregon Labor Market Information System
Skill Match Analysis for Drafters and Architects

Skills Common to Both Occupations

- Apply Advanced Technical Math (Trig, Calculus, Statistics Etc.)
- Apply Basic Engineering Principles
- Apply Drafting/Mechanical Drawing Knowledge & Techniques
- Apply Field Notes To Detailed Technical Drawings
- Apply Geometry
- Apply Government Regulations
- Apply Graphic Arts Techniques
- Apply Land Surveying Techniques
- Apply Trigonometry To Architecture
- Draw Prototypes/Plans To Scale
- Interpret Aerial Photographs
- Interpret Engineering Data/Reports From Computer
- Interpret Maps For Architecture, Construction, Civil Engineering, Etc.
- Interpret Property Documents
- Prepare Maps/Charts
- Read Aerial Photographs
- Research Property Records Prior To Design Work Or Surveys
- Use Computer Aided Design Software
- Use Computer Aided Drafting Software
- Use Computer Design/Graphics Technology/Software
- Use Computer Keyboard
- Use Construction Industry Codes And Symbols On Blueprints
- Use Design/Graphics Principles In Civil Technology & Mapmaking
- Use Spreadsheet Software
- Use Word Processing Software
- Visualize Spatial Relationships In Construction & Mapping

Skills for Drafters Only

- Apply Electronic Principles
- Operate/Adjust Blueprinting Equipment
- Read Schematics
- Read Technical Drawings & Specifications
- Read/Understand Operating Manuals
- Understand Manufacturing Methods & Techniques

Skills for Architects Only

- Apply Design Engineering Theory
- Apply Regulations To Surveying & Construction Activities
- Apply Ship Structure Principles
- Apply Structural/Safety Principles To Buildings & Other Construction Projects
- Apply Technical Regulations To Engineering Problems
- Apply Time Management Theory
- Apply Urban Design Theory
- Bid Engineering, Construction Or Extraction Projects
- Conduct Plant Location Surveys
- Coordinate Personnel In Support Of Engineering Activities
- Delegate Authority For Engineering Activities
- Design Civil Engineering Projects
- Design Construction Projects
Design/Supervise Civil Construction
Estimate Time Needed For Project
Evaluate Costs Of Engineering Projects
Explain Complex Mathematical Information
Judge Distances
Judge Soil Conditions
Lead Teams In Engineering Projects
Manage Civil/Surveying Projects
Manage Engineering Projects
Organize/Prioritize Work For Cost Estimation
Prepare Cost Estimates For Construction & Other Projects
Read Blueprints/Technical Drawings
Read Maps
Read Tape Measure
Research/Apply Building & Land Use Regulations
Supervise Engineering Managers & Staff
Translate Design Specifications To Cost Estimates
Understand Government Construction Contracting Regulations
Use Correct Grammar, Punctuation & Spelling
Use Creativity In Designing Interior Spaces
Use Creativity In Graphic Design
Use Trigonometry
Work As A Team Member

Oregon Employment Department © 2002 - 2003
Occupational Summary for Drafters
Oregon Statewide

Description: Prepare working plans and detail drawings from rough or detailed sketches and notes for engineering or manufacturing purposes according to specified dimensions. Utilize knowledge of various machines, engineering practices, mathematics, building materials, and other physical sciences to complete drawings. May use computer-assisted drafting (CAD) equipment and software.

Employment Projections

<table>
<thead>
<tr>
<th>Region</th>
<th>Employment</th>
<th>Percent Change</th>
<th>Annual Openings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oregon</td>
<td>3,837</td>
<td>94</td>
<td>118</td>
</tr>
<tr>
<td>Statewide</td>
<td>3,031</td>
<td>2.4%</td>
<td></td>
</tr>
</tbody>
</table>

Wages

<table>
<thead>
<tr>
<th>Region</th>
<th>Median Hourly</th>
<th>Avg Annual</th>
<th>Middle Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oregon</td>
<td>$17.08</td>
<td>$36,909</td>
<td>$14.16 - 20.37</td>
</tr>
<tr>
<td>Statewide</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Current Job Openings

<table>
<thead>
<tr>
<th>Job Title</th>
<th>Location</th>
<th>Order Number</th>
<th>Wage Offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Designer/Drafter</td>
<td>Medford</td>
<td>4107672</td>
<td>N/A</td>
</tr>
<tr>
<td>Autocad</td>
<td>Portland Metro</td>
<td>1810017</td>
<td>N/A</td>
</tr>
<tr>
<td>Engineering (Si)</td>
<td>Portland</td>
<td>1070309</td>
<td>$12.12/hr</td>
</tr>
<tr>
<td>Draft Spec Writer</td>
<td>Baker City Or</td>
<td>9208252</td>
<td>$12.00/hr</td>
</tr>
<tr>
<td>Technical Illustrator</td>
<td>Eugene</td>
<td>3110440</td>
<td>$13.42/hr</td>
</tr>
<tr>
<td>Designer/Draftsman</td>
<td>Hillsboro</td>
<td>2806777</td>
<td>$13.00/hr</td>
</tr>
<tr>
<td>Engineer III</td>
<td>Kelo</td>
<td>2816486</td>
<td>$58,236/yr</td>
</tr>
<tr>
<td>Cad/CAD Designer</td>
<td>Forest Grove</td>
<td>2806557</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Industries of Employment

<table>
<thead>
<tr>
<th>Industry</th>
<th>Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Industries</td>
<td>3,837</td>
</tr>
<tr>
<td>Engineering &amp; Management Services</td>
<td>1,663</td>
</tr>
<tr>
<td>Electronic &amp; Other Electric Equipment</td>
<td>418</td>
</tr>
<tr>
<td>Industrial Machinery And Equipment</td>
<td>338</td>
</tr>
<tr>
<td>Business Services</td>
<td>188</td>
</tr>
<tr>
<td>Special Trade Contractors</td>
<td>151</td>
</tr>
</tbody>
</table>

Occupations with Similar Skills

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Skill Overlap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utilities Estimators &amp; Drafters</td>
<td>52%</td>
</tr>
<tr>
<td>Landscape Architects</td>
<td>45%</td>
</tr>
<tr>
<td>Architects</td>
<td>38%</td>
</tr>
<tr>
<td>Surveying &amp; Mapping Technicians</td>
<td>32%</td>
</tr>
<tr>
<td>Civil Engineering Technicians</td>
<td>91%</td>
</tr>
</tbody>
</table>

Statewide Employment Analysis:
2000 employment in this occupation is estimated to be much larger than average. Growth is projected to be slower than average. Annual new openings are expected to be much higher than average.

Statewide Outlook:
Outlook can vary by industry. Employment opportunities for architectural and civil drafters are primarily affected by construction industry activity levels. These levels are short term in nature, and are not directly reflected in the above projections, which are long term. Mechanical and electronic drafters can also be affected by short term business cycle fluctuations. Overall, if employment in these industries is growing, reasonable opportunities would exist. In stagnant or recessionary times, competition for drafting positions would be intense.

Educational Requirements:
Workers must have post-secondary training to gain the necessary skills for this occupation. However, those with an associate degree would have a competitive advantage in this labor market.

Oregon Employment Department © 2001 - 2002

http://www.qualityinfo.org/olmisj/OIC?occ=22514&occtype=OES&area=010000000&actio... 5/19/2003
for drafting positions would be intense.

Current Job Openings
for Drafters
Oregon Statewide

There are 8 openings for this occupation. Openings 1 to 8 are listed below. Check for more job openings on America's Job Bank.

<table>
<thead>
<tr>
<th>Job Title</th>
<th>Date Posted</th>
<th>Location</th>
<th>Wage Offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Designer/Drafter</td>
<td>5/12/03</td>
<td>Medford</td>
<td>N/A</td>
</tr>
<tr>
<td>Autocad</td>
<td>5/9/03</td>
<td>Portland Metro</td>
<td>N/A</td>
</tr>
<tr>
<td>Engineering (Sj)</td>
<td>5/5/03</td>
<td>Portland</td>
<td>$12.12/hr</td>
</tr>
<tr>
<td>Draft Spec Writer</td>
<td>4/29/03</td>
<td>Baker City Or</td>
<td>$12.00/hr</td>
</tr>
<tr>
<td>Technical Illustrator</td>
<td>4/18/03</td>
<td>Eugene</td>
<td>$13.42/hr</td>
</tr>
<tr>
<td>Designer/Draftsman</td>
<td>4/11/03</td>
<td>Hillsboro</td>
<td>$13.00/hr</td>
</tr>
<tr>
<td>Engineer Iii</td>
<td>4/11/03</td>
<td>Kelso</td>
<td>$58,236/yr</td>
</tr>
<tr>
<td>Cad/Pcb Designer</td>
<td>2/19/03</td>
<td>Forest Grove</td>
<td>N/A</td>
</tr>
</tbody>
</table>

For questions about the job listings and how to register or enroll for Employment Services, write to job_search@emp.state.or.us.

Oregon License Information
for Drafters

No state license information was found for this occupation.

Wages for Drafters

<table>
<thead>
<tr>
<th>Region</th>
<th>2002 Wages</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Avg Hourly ($/hr)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Oregon Statewide</td>
<td>$17.75</td>
</tr>
<tr>
<td>Multnomah / Tillamook / Washington</td>
<td>18.62</td>
</tr>
<tr>
<td>Marion / Polk / Yamhill</td>
<td>17.73</td>
</tr>
<tr>
<td>Benton / Lincoln / Linn</td>
<td>17.08</td>
</tr>
<tr>
<td>Lane</td>
<td>16.38</td>
</tr>
<tr>
<td>Douglas</td>
<td>15.13</td>
</tr>
<tr>
<td>Jackson / Josephine</td>
<td>15.76</td>
</tr>
<tr>
<td>Crook / Deschutes /</td>
<td>16.34</td>
</tr>
</tbody>
</table>

http://www.qualityinfo.org/olmisj/OIC?occ=22514&occtype=OES&area=01000000&actio... 5/19/2003
### Jefferson

<table>
<thead>
<tr>
<th>Region</th>
<th>Employment 2000</th>
<th>Employment 2010</th>
<th>Change</th>
<th>% Change</th>
<th>Annual Openings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morrow / Umatilla</td>
<td>17.46</td>
<td>36,323</td>
<td>14.57</td>
<td>18.50</td>
<td>20.25</td>
</tr>
<tr>
<td>Clackamas</td>
<td>17.49</td>
<td>36,370</td>
<td>13.96</td>
<td>16.66</td>
<td>19.30</td>
</tr>
</tbody>
</table>

**Data Sources and Limitations**

### Regional Employment Projections for Drafters

<table>
<thead>
<tr>
<th>Region</th>
<th>Employment 2000</th>
<th>Employment 2010</th>
<th>Change</th>
<th>% Change</th>
<th>Annual Openings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oregon Statewide</td>
<td>3,837</td>
<td>3,931</td>
<td>94</td>
<td>2.4%</td>
<td>118</td>
</tr>
<tr>
<td>Multnomah / Tillamook / Washington</td>
<td>2,031</td>
<td>2,073</td>
<td>42</td>
<td>2.1%</td>
<td>62</td>
</tr>
<tr>
<td>Clackamas</td>
<td>482</td>
<td>557</td>
<td>75</td>
<td>15.6%</td>
<td>22</td>
</tr>
<tr>
<td>Lane</td>
<td>458</td>
<td>474</td>
<td>16</td>
<td>3.5%</td>
<td>15</td>
</tr>
<tr>
<td>Marion / Polk / Yamhill</td>
<td>238</td>
<td>245</td>
<td>7</td>
<td>2.9%</td>
<td>8</td>
</tr>
<tr>
<td>Benton / Lincoln / Linn</td>
<td>217</td>
<td>223</td>
<td>6</td>
<td>2.8%</td>
<td>7</td>
</tr>
<tr>
<td>Jackson / Josephine</td>
<td>141</td>
<td>165</td>
<td>24</td>
<td>17.0%</td>
<td>6</td>
</tr>
<tr>
<td>Crook / Deschutes / Jefferson</td>
<td>70</td>
<td>69</td>
<td>-1</td>
<td>-1.4%</td>
<td>2</td>
</tr>
<tr>
<td>Douglas</td>
<td>42</td>
<td>40</td>
<td>-2</td>
<td>-4.8%</td>
<td>1</td>
</tr>
<tr>
<td>Clatsop / Columbia</td>
<td>37</td>
<td>42</td>
<td>5</td>
<td>13.5%</td>
<td>2</td>
</tr>
<tr>
<td>Gilliam / Hood River / Sherman / Wheeler / Wasco</td>
<td>37</td>
<td>38</td>
<td>1</td>
<td>2.7%</td>
<td>1</td>
</tr>
<tr>
<td>Morrow / Umatilla</td>
<td>16</td>
<td>18</td>
<td>2</td>
<td>12.5%</td>
<td>0</td>
</tr>
<tr>
<td>Coos / Curry</td>
<td>15</td>
<td>19</td>
<td>4</td>
<td>26.7%</td>
<td>0</td>
</tr>
<tr>
<td>Baker / Union / Wallowa</td>
<td>10</td>
<td>10</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>Klamath / Lake</td>
<td>9</td>
<td>10</td>
<td>1</td>
<td>11.1%</td>
<td>0</td>
</tr>
<tr>
<td>Grant / Harney / Malheur</td>
<td>8</td>
<td>9</td>
<td>1</td>
<td>12.5%</td>
<td>0</td>
</tr>
</tbody>
</table>

**Data Sources and Limitations**

### Primary Industries of Employment for Drafters

**Oregon Statewide**

Note: The employment figures below refer to the number of Drafters within each listed industry. The number of firms refers to the total number of firms in the InfoUSA database for the given industry. To view employers for a particular industry, click on the number of firms in the rightmost column.

<table>
<thead>
<tr>
<th>Industry</th>
<th>2000 Employment</th>
<th>Firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL INDUSTRIES</td>
<td>3,837</td>
<td></td>
</tr>
<tr>
<td>AGRICULTURAL SERVICES</td>
<td>41</td>
<td>3,094</td>
</tr>
<tr>
<td>Landscape and Horticultural Services</td>
<td>41</td>
<td>1,622</td>
</tr>
<tr>
<td>GENERAL BUILDING CONTRACTORS</td>
<td>98</td>
<td>5,235</td>
</tr>
<tr>
<td>Residential Building Construction</td>
<td>88</td>
<td>4,387</td>
</tr>
<tr>
<td>SPECIAL TRADE CONTRACTORS</td>
<td>151</td>
<td>8,239</td>
</tr>
<tr>
<td>Plumbing, Heating, Air-Conditioning</td>
<td>79</td>
<td>1,604</td>
</tr>
<tr>
<td>Electrical Work</td>
<td>47</td>
<td>829</td>
</tr>
<tr>
<td>LUMBER AND WOOD PRODUCTS, EXCEPT FURNITURE &amp; FIXTURES</td>
<td>106</td>
<td>1,208</td>
</tr>
<tr>
<td>PRIMARY METAL INDUSTRIES</td>
<td>56</td>
<td>113</td>
</tr>
<tr>
<td>FABRICATED METAL PRODUCTS</td>
<td>43</td>
<td>125</td>
</tr>
<tr>
<td>Fabricated Structural Metal Products</td>
<td>132</td>
<td>624</td>
</tr>
<tr>
<td>INDUSTRIAL MACHINERY AND EQUIPMENT</td>
<td>90</td>
<td>272</td>
</tr>
<tr>
<td>Construction and Related Machinery</td>
<td>34</td>
<td>99</td>
</tr>
<tr>
<td>Metalworking Machinery</td>
<td>111</td>
<td>94</td>
</tr>
<tr>
<td>Special Industry Machinery</td>
<td>34</td>
<td>32</td>
</tr>
<tr>
<td>General Industrial Machinery</td>
<td>364</td>
<td>145</td>
</tr>
<tr>
<td>Electronic Components and Accessories</td>
<td>418</td>
<td>276</td>
</tr>
<tr>
<td>TRANSPORTATION EQUIPMENT</td>
<td>78</td>
<td>262</td>
</tr>
<tr>
<td>Motor Vehicles and Equipment</td>
<td>81</td>
<td>205</td>
</tr>
<tr>
<td>INSTRUMENTS AND RELATED PRODUCTS</td>
<td>54</td>
<td>88</td>
</tr>
<tr>
<td>Measuring and Controlling Devices</td>
<td>50</td>
<td>857</td>
</tr>
<tr>
<td>MISCELLANEOUS MANUFACTURING INDUSTRIES</td>
<td>46</td>
<td>198</td>
</tr>
<tr>
<td>RUBBER AND MISCELLANEOUS PLASTICS PRODUCTS</td>
<td>41</td>
<td>157</td>
</tr>
<tr>
<td>Miscellaneous Plastics Products, NEC</td>
<td>33</td>
<td>563</td>
</tr>
<tr>
<td>ELECTRIC, GAS, AND SANITARY SERVICES</td>
<td>87</td>
<td>6,459</td>
</tr>
<tr>
<td>WHOLESALE TRADE-DURABLE GOODS</td>
<td>66</td>
<td>6,501</td>
</tr>
<tr>
<td>REAL ESTATE</td>
<td>59</td>
<td>666</td>
</tr>
<tr>
<td>Subdividers and Developers</td>
<td>188</td>
<td>9,471</td>
</tr>
<tr>
<td>BUSINESS SERVICES</td>
<td>31</td>
<td>573</td>
</tr>
<tr>
<td>Personnel Supply Services</td>
<td>114</td>
<td>1,708</td>
</tr>
<tr>
<td>Computer and Data Processing Services</td>
<td>41</td>
<td>2,918</td>
</tr>
<tr>
<td>ENGINEERING &amp; MANAGEMENT SERVICES</td>
<td>1,663</td>
<td>5,961</td>
</tr>
<tr>
<td>Engineering &amp; Architectural Services</td>
<td>1,604</td>
<td>1,718</td>
</tr>
<tr>
<td>Management and Public Relations</td>
<td>35</td>
<td>1,990</td>
</tr>
<tr>
<td>EXECUTIVE, LEGISLATIVE, AND GENERAL</td>
<td>38</td>
<td>2,404</td>
</tr>
<tr>
<td>Executive and Legislative Combined</td>
<td>38</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Data Sources and Limitations

Oregon Skills for Drafters
Apply Advanced Technical Math (Trig, Calculus, Statistics Etc.)
Apply Basic Engineering Principles
Apply Drafting/Mechanical Drawing Knowledge & Techniques
Apply Electronic Principles
Apply Field Notes To Detailed Technical Drawings
Apply Geometry
Apply Government Regulations
Apply Graphic Arts Techniques
Apply Land Surveying Techniques
Apply Trigonometry To Architecture
Draw Prototypes/Plans To Scale
Interpret Aerial Photographs
Interpret Engineering Data/Reports From Computer
Interpret Maps For Architecture, Construction, Civil Engineering, Etc.
Interpret Property Documents
Operate/Adjust Blueprinting Equipment
Prepare Maps/Charts
Read Aerial Photographs
Read Schematics
Read Technical Drawings & Specifications
Read/Understand Operating Manuals
Research Property Records Prior To Design Work Or Surveys
Understand Manufacturing Methods & Techniques
Use Computer Aided Design Software
Use Computer Aided Drafting Software
Use Computer Design/Graphics Technology/Software
Use Computer Keyboard
Use Construction Industry Codes And Symbols On Blueprints
Use Design/Graphics Principles In Civil Technology & Mapmaking
Use Spreadsheet Software
Use Word Processing Software
Visualize Spatial Relationships In Construction & Mapping

Data Sources and Limitations

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**Occupations with Skills Similar to Drafters**

The scores listed below indicates how closely the skills for Drafters matches the occupation in the list. A score of 100% means the occupations have identical skill sets. A maximum of 10 occupations are displayed below.

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Skill Overlap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utilities Estimators &amp; Drafters</td>
<td>82%</td>
</tr>
<tr>
<td>Landscape Architects</td>
<td>45%</td>
</tr>
<tr>
<td>Architects</td>
<td>38%</td>
</tr>
<tr>
<td>Surveying &amp; Mapping Technicians</td>
<td>32%</td>
</tr>
<tr>
<td>Civil Engineering Technicians</td>
<td>31%</td>
</tr>
<tr>
<td>Surveying &amp; Mapping Scientists</td>
<td>27%</td>
</tr>
<tr>
<td>Civil &amp; Traffic Engineers</td>
<td>26%</td>
</tr>
<tr>
<td>Cost Estimators</td>
<td>23%</td>
</tr>
</tbody>
</table>
Educational Requirements
for Drafters

Workers must have post-secondary training to gain the necessary skills for
this occupation. However, those with an associate degree would have a
competitive advantage in this labor market.

Education and Training Providers
for Drafters

The training providers listed below offer one or more of the following
programs. For general information about each program, click on its title.

Drafting, General

Architectural Drafting

Civil/Structural Drafting

Mechanical Drafting

NOTE: Reference to any specific training institution below does not
constitute or imply its endorsement, recommendation, or favoring by the
State of Oregon.

ITT Technical Institute
6035 Northeast 78th Court
Portland OR 97218-2854
Phone: (503) 255-6500

Central Oregon Community
College
2600 NW College Way
Bend OR 97701-5998
Phone: (541) 383-7264
Training Programs Offered:

- Drafting, General

Blue Mountain Community
College
2411 NW Carden Avenue
Pendleton OR 97801-0100
Phone: (541) 267-5165

Clatsop Community College
1653 Jerome Avenue
Astoria OR 97103-3698
Phone: (503) 338-2414

Lane Community College
4000 E 30th Avenue
Eugene OR 97405-0640
Phone: (541) 463-3100
Training Programs Offered:

- Drafting, General

Chemeketa Community College
4000 Lancaster Drive NE
Salem OR 97309-7070
Phone: (503) 399-5000
Training Programs Offered:

- Mechanical Drafting
- Drafting, General

Clackamas Community College
19600 S. Molalla Avenue
Oregon City OR 97045-7998
Phone: (503) 657-6958
Training Programs Offered:

Treasure Valley Community
College
650 College Blvd.
Ontario OR 97914-2646
Phone: (541) 889-6493
- Drafting, General

Training Programs Offered:
- Drafting, General

**Mt Hood Community College**
26000 SE Stark Street
Gresham OR 97030-4914
Phone: (503) 491-7346
Training Programs Offered:
- Mechanical Drafting
- Architectural Drafting

**Portland Community College**
12000 SW 49th Avenue
Portland OR 97219-6960
Phone: (503) 977-4503
Training Programs Offered:
- Architectural Drafting
- Drafting, General

Oregon Employment Department © 2002 - 2003
Job Display - 4107872

Date Listed: 05/12/2003
Job Location: Medford
Salary: 0.00/Other
Education Required: 16
Experience Required: 36 Months
Minimum Age: N/A
Hours Worked Per Week: 40
Shift: Day Shift
Duration of Job: More than 150 days, Full Time

Additional Requirements

Job Summary:

REQ: 3 YRS EXP, COLLEGE DEGREE, AUTOCAD 2000, ARCHITECTURAL DESKTOP
JOB: PREPARE ARCHITECTURAL PRESENTATION DRAWINGS, CONSTRUCTION DRAWINGS, DETAILS FOR COMMERCIAL, EDUCATIONAL, INSTITUTIONAL PROJECTS. USE AUTOCAD 2000, ARCHITECTURAL DESKTOP, CAD MANAGER.
HRS: 40 HRS/WEEK, 8AM-5PM, MON-FRI
PAY: DEPENDING ON EXPERIENCE, MINIMUM WAGE GUARANTEED

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http://www.emp.state.or.us/jobs/jobdisplay.cfm?jnum=N4107872&lang=E 5/19/2003
Job Title: DRAFT SPEC WRITER  
Job Number: 9208252

Date Listed: 04/29/2003
Job Location: Baker City Or
Salary: 12.00/Hour-$17.00/Hr
Education Required
Experience Required: 24 Months
Minimum Age: 18
Hours Worked Per Week: 40
Shift: Day Shift
Duration of Job: 4-150 days, Full Time

Additional Requirements

Job Summary:

REQ: 2 YRS AUTOCAD OR CADKEY EXP, EXP WITH MS WORD AND EXCEL, 18 YRS OF AGE TO WORK W/EQUIPMENT, STRONG WRITING, LANGUAGE AND COMPUTER SKILLS
JOB: WRITING AND UPDATING SPECIFICATIONS AND DRAWING PRODUCTS IN CAD HRS: 7:30 AM - 4 PM MON-FRI PAY: $12-$17/HOUR DEPEND ON EXP
*****TEMPORARY POSITION TO START, COULD BECOME PERMANENT*****

How to apply for this position:
For more information about this job opportunity, please note the job number and contact the Employment Office nearest you.

[ List of All Offices with Phone Numbers ]

Access our statewide or regional occupation report for more information about wages, employment outlooks, skills, training programs, related occupations, and more.

Start a new search  Return to Job List
Search results for **architectural drafter**

No occupations matching your search criteria were found.
Search results for **building designer**

No occupations matching your search criteria were found.