

Major Highlights

Program Dashboard

**Program Dashboard –
Percent of Targets
Achieved**

Credit Hour Trends

Degree Trends

Occupational Projections

**Occupational Skills
Analysis**

Program Assessment Plan

**Program Assessment
Results**

CRC Recommendations

CRC Follow-Up

**Architecture Curriculum Review
Major Highlights
January 2008**

Overview

The information contained in this binder represents supporting reports and data associated with the CRC's review of the Architecture program. These documents are intended to provide a historical perspective, as well as an idea of current strengths and future challenges facing the program which may impact short and long term decision-making.

Major Highlights

- The overall composite dashboard score for Architecture has been slowly decreasing over the past four years. The most recent composite score (2006-07) was 8.71, bringing it down to a ranking of 74th among all curriculum offered at the college.
- Four out of the seven program dashboard measures fell within the established college benchmarks, while the remaining three fell below their benchmarks. Measures that fell into the red zone include: sections filled to capacity, percent of minority students and the percent of withdrawals.
- Although the percent of sections filled to capacity has seen improvement over the past four years, Architecture sections continue to fall below the trouble score (75%) as well as below the college-wide average of 84%.
- The percent of minority students has varied over the last four years and in 2006-07 was at its lowest point of 15%, which is also lower than the college-wide level of 28%. In addition, the percent of students withdrawing from Architecture courses has varied over the last four years. In 2006-07, nearly 18% of students had withdrawn from ARC courses, and although this is in line with the college-wide average, it still exceeds the established trouble score of 15%.
- Credit hour enrollment in ARC courses have seen periods of steady decline as well as periods of growth over the past ten years. Enrollment reached a low point between 1998-99 and 2000-01. However, since that time, enrollment has been steadily increasing each year and has reached a ten-year high in 2006-07.
- Over the past ten years a total of only 14 Associate degrees have been awarded in this extended degree program, with 11 of those graduates occurring in the past five years.
- Occupations associated with the field of Architecture are expected to experience varying levels of growth over the next five years. Some occupations are projected to see an increase in the number of new jobs available, with the largest increase expected in construction and building inspectors. As a group, a total number of 450 new jobs are projected by 2012. The single occupation that projects a decrease in the next five years is architectural and civil drafters.
- In terms of program assessment, the Architecture program has identified three Learning Outcomes along with four Benchmarks. Over the past twelve months there is no indication that assessment of student learning based on this plan is being conducted.

- In November 2007, a major revision to the Architecture program was approved by the College Curriculum Committee. As a result of this curriculum action it is necessary that the program assessment plan be reviewed and accordingly revised to accurately reflect curriculum changes.

Oakland Community College Program Dashboard

The purpose of the program dashboard is to provide a data driven tool designed for the objective review of all curriculum offerings. Based on a common set of measures which apply to all programs/disciplines the dashboard facilitates the systematic identification of well performing as well as ailing curriculum so early intervention efforts can be undertaken.

In a rapidly changing economic and competitive environment it is necessary if not imperative to continually review curriculum offerings annually. Dashboard reports are a useful tool for monitoring program performance. In addition, they allow for an integrated approach for collecting, presenting, and monitoring data to meet long and short-term programmatic decision-making needs.

The Program Dashboard is based on seven measures which include:

- Sections Filled to Capacity
- Percent of Completed Sections
- Credit Hour Trend Ratio
- Percent of Minority Students
- Percent of Withdrawals
- Percent of Incompletes
- Student Course Completion Rate

The following report provides summative information for the most recent academic year as well as detailed trend data on each measure over the past several years.

Program Dashboard Detail Report

Prefix ARC
Title Architecture

| | Program | | | | College Wide |
|---------------------------------------|----------------|----------------|----------------|----------------|---------------------|
| | 2006-07 | 2005-06 | 2004-05 | 2003-04 | 2006-07 |
| Sections Filled to Capacity | 72.3% | 68.5% | 66.7% | 63.0% | 84.4% |
| Percent of Completed Sections | 76.7% | 70.6% | 78.6% | 90.5% | 90.7% |
| Headcount Trend Ratio | 1.09 | 1.11 | 1.09 | 1.20 | 1.01 |
| Credit Hour Trend Ratio | 1.09 | 1.11 | 1.10 | 1.19 | 1.01 |
| Percent of Minority Students | 15.3% | 19.0% | 23.3% | 17.3% | 28.2% |
| Percent of Withdrawals | 17.7% | 17.4% | 16.4% | 18.5% | 18.3% |
| Percent of Incompletes | 1.8% | 2.9% | 0.0% | 0.0% | 1.5% |
| Student Course Completion Rate | 69.7% | 70.9% | 69.7% | 71.0% | 67.7% |
| Dashboard Score | 8.71 | 8.72 | 8.89 | 8.93 | |

Sections Filled to Capacity

Prefix ARC
Prefix Title Architecture

| | 2006-07 | 2005-06 | 2004-05 | 2003-04 |
|------------------------------------|----------------|----------------|----------------|----------------|
| Total Students | 391 | 376 | 323 | 306 |
| Total Capacity | 541 | 549 | 484 | 486 |
| Sections Filled To Capacity | 72.3% | 68.5% | 66.7% | 63.0% |

Definition:

The percent of all available seats which are filled on the terms official census date. Time Frame: Academic Year (Summer II, Fall, Winter, Summer I). Data Source: One-tenth-day of each term.

Methodology:

Total number of sections (credit courses only) that are filled to their designated capacity e.g. allocated seats divided by the total number of available seats in all sections throughout the academic year (July 1 through June 30). In other words, how many sections are filled to their capacity on the sections 1/10 day out of all sections? Include sections that are more than filled / overflowing in calculation.

One-Tenth Day data shows the capacity filled numbers at approximately 3 weeks after the Fall and Winter terms begin; and 1 week after the Summer I and II terms begin. This data will not provide additional enrollment data if the sections begin after the one-tenth day.

While a section may only have a few students enrolled in it the college is able to designate some sections as 'full' so that they are not cancelled (per OCCFA Master Agreement). Therefore some disciplines may show low fill capacity rates, and the college never cancelled the sections or condense the students into fewer sections offering the same course.

Percent of Completed Sections

Prefix ARC

Prefix Title Architecture

| | 2006-07 | 2005-06 | 2004-05 | 2003-04 |
|--------------------------------------|----------------|----------------|----------------|----------------|
| Active Sections | 23 | 24 | 22 | 19 |
| Cancelled Sections | 7 | 10 | 6 | 2 |
| Total Sections | 30 | 34 | 28 | 21 |
| Percent of Completed Sections | 76.7% | 70.6% | 78.6% | 90.5% |

Definition:

Of all offered sections, the percent of sections that are completed (not cancelled). Time Frame: Academic Year (Summer II, Fall, Winter, Summer I). Data Source: End of session, after grades are posted.

Methodology:

Annually, the total number of offered credit sections that are completed. Formula = number of completed credit sections divided by the total number of offered credit sections. In other words, the percent of these sections that are not cancelled.

Headcount Trend Ratio

Prefix ARC
Prefix Title Architecture

| | 2006-07 | 2005-06 | 2004-05 | 2003-04 |
|---------------------------|----------------|----------------|----------------|----------------|
| Headcount Year 1 | 306 | 275 | 249 | 168 |
| Headcount Year 2 | 326 | 306 | 275 | 249 |
| Headcount Year 3 | 376 | 326 | 306 | 275 |
| Headcount Year 4 | 392 | 376 | 326 | 306 |
| Headcount Period 1 | 336 | 302 | 277 | 231 |
| Headcount Period 2 | 365 | 336 | 302 | 277 |
| Headcount Ratio | 1.09 | 1.11 | 1.09 | 1.20 |

Definition:

Trend in student headcount based on a three year rolling average. Time Frame: Academic Year (Summer II, Fall, Winter, Summer I). Data Source: One-tenth-day of each term. (Note: this measure is not used in the calculation of the Program Dashboard score since it parallels trends depicted in Credit Hours.)

Methodology:

In order to establish a meaningful enrollment statistic which applies to large as well as small disciplines/programs a "ratio" was calculated based on a three year rolling average of student headcount.

The formula used to calculate this measure involves three simple steps:

- a. Year 1 + Year 2 + Year 3 / 3 = Period 1
- b. Year 2 + Year 3 + Year 4 / 3 = Period 2
- c. Period 2 / Period 1 = Ratio

If the ratio is greater than "1" this means there has been an enrollment increase. On the other hand, if the ratio is less than "1" this translates into an enrollment decline. The larger the number the larger the enrollment increase. Likewise, the lower the number the greater the enrollment decline.

Credit Hour Trend Ratio

Prefix ARC
Prefix Title Architecture

| | 2006-07 | 2005-06 | 2004-05 | 2003-04 |
|-----------------------------|----------------|----------------|----------------|----------------|
| Credit Hour Year 1 | 1,136 | 1,022 | 926 | 637 |
| Credit Hour Year 2 | 1,231 | 1,136 | 1,022 | 926 |
| Credit Hour Year 3 | 1,398 | 1,231 | 1,136 | 1,022 |
| Credit Hour Year 4 | 1,471 | 1,398 | 1,231 | 1,136 |
| Credit Hour Period 1 | 1,255 | 1,130 | 1,028 | 862 |
| Credit Hour Period 2 | 1,367 | 1,255 | 1,130 | 1,028 |
| Credit Hour Ratio | 1.09 | 1.11 | 1.10 | 1.19 |

Definition:

Trend in student credit hours based on a three year rolling average. Time Frame: Academic Year (Summer II, Fall, Winter, Summer I). Data Source: One-tenth-day of each term.

Methodology:

In order to establish a meaningful enrollment statistic which applies to large as well as small disciplines/programs a "ratio" was calculated based on a three year rolling average of student credit hours.

The formula used to calculate this measure involves three simple steps:

- a. Year 1 + Year 2 + Year 3 / 3 = Period 1
- b. Year 2 + Year 3 + Year 4 / 3 = Period 2
- c. Period 2 / Period 1 = Ratio

If the ratio is greater than "1" this means there has been an enrollment increase. On the other hand, if the ratio is less than "1" this translates into an enrollment decline. The larger the number the larger the enrollment increase. Likewise, the lower the number the greater the enrollment decline.

Percent of Minority Students

Prefix ARC

Prefix Title Architecture

| | 2006-07 | 2005-06 | 2004-05 | 2003-04 |
|-------------------------------------|----------------|----------------|----------------|----------------|
| Minority Students | 32 | 40 | 44 | 32 |
| Total Students | 209 | 211 | 189 | 185 |
| Percent of Minority Students | 15.3% | 19.0% | 23.3% | 17.3% |

Definition:

The percent of students who are minority. Minority status is self-reported by the student and includes: African American, Asian, Hispanic, Native American Indian and Other. Time Frame: Academic Year (Summer II, Fall, Winter, Summer I). Data Source: end of session for each term.

Methodology:

Percentages are based on known data and exclude missing information.

Percent of Withdrawals

Prefix ARC

Prefix Title Architecture

| | 2006-07 | 2005-06 | 2004-05 | 2003-04 |
|-------------------------------|----------------|----------------|----------------|----------------|
| Total Withdrawals | 69 | 61 | 53 | 53 |
| Total Grades | 389 | 350 | 323 | 286 |
| Percent of Withdrawals | 17.7% | 17.4% | 16.4% | 18.5% |

Definition:

The percent of students who withdraw from their course after the term begins. Time Frame: Academic Year (Summer II, Fall, Winter, Summer I). Data Source: End of session files, after grades are posted.

Methodology:

Percent of withdrawals is derived by dividing the total number of student initiated withdrawals by the total number of grades and marks awarded throughout the academic year. The Withdrawal-Passing (WP), and Withdrawal-Failing (WF) are considered Withdrawals (W). Meanwhile, calculations exclude: Audit (AU), Not Attended (N), and Not Reported (NR).

Percent of Incompletes

Prefix ARC

Prefix Title Architecture

| | 2005-06 | 2005-06 | 2004-05 | 2003-04 |
|-------------------------------|----------------|----------------|----------------|----------------|
| Total Incompletes | 7 | 10 | 0 | 0 |
| Total Grades | 389 | 350 | 323 | 286 |
| Percent of Incompletes | 1.8% | 2.9% | 0.0% | 0.0% |

Definition:

The percent of students who receive an incomplete in their course. Time Frame: Academic Year (Summer II, Fall, Winter, Summer I). Data Source: End of session files, after grades are posted.

Methodology:

Percent of incompletes is derived by dividing the total number of incompletes by the total number of grades and marks awarded throughout the academic year. The Continuous Progress (CP) grade is considered an Incomplete (I). Meanwhile, calculations exclude: Audit (AU), Not Attended (N), and Not Reported (NR).

Student Course Completion Rate

Prefix ARC

Prefix Title Architecture

| | 2006-07 | 2005-06 | 2004-05 | 2003-04 |
|---------------------------------------|----------------|----------------|----------------|----------------|
| Successful Grades | 271 | 248 | 225 | 203 |
| Total Student Grades | 389 | 350 | 323 | 286 |
| Student Course Completion Rate | 69.7% | 70.9% | 69.7% | 71.0% |

Definition:

The percent of students who successfully complete a course with a grade of "C" or higher. Time Frame: Academic Year (Summer II, Fall, Winter, Summer I). Data Source: End of session files, after grades are posted.

Methodology:

Student success rates are based on end of session data after all grades have been posted. Data includes grades from the entire academic year (Summer II, Fall, Winter, and Summer I). The following grades/marks are excluded from the calculation: Audit (AU), Not Attended (N) and Not Reported (NR).

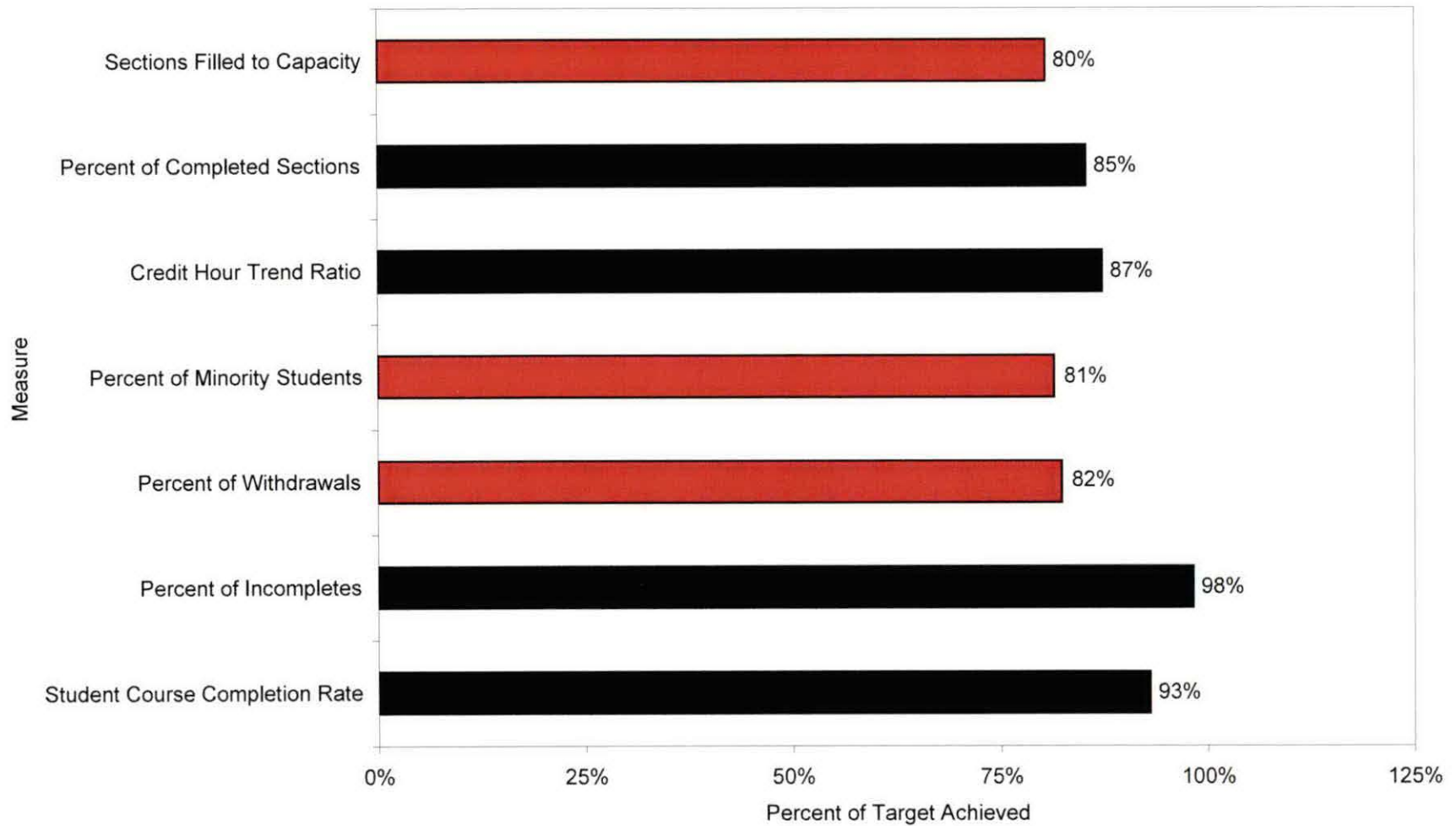
Oakland Community College Program Dashboard Percent of Targets Achieved

The following graph and table depict the extent to which each of the seven Program Dashboard measures met established college-wide benchmarks. Benchmarks (targets and trouble scores) are based on historical data and reflect a range within which each measure is expected to perform.

Measures which exceed the established benchmark are depicted in green, while those that fall short of the benchmark are shown in red. This information is useful in identifying areas of excellence, as well as areas of concern. As a consequence, this report can help to identify specific areas which may require additional attention by program staff.

Oakland Community College Program Dashboard Report 2006-07

Architecture ARC



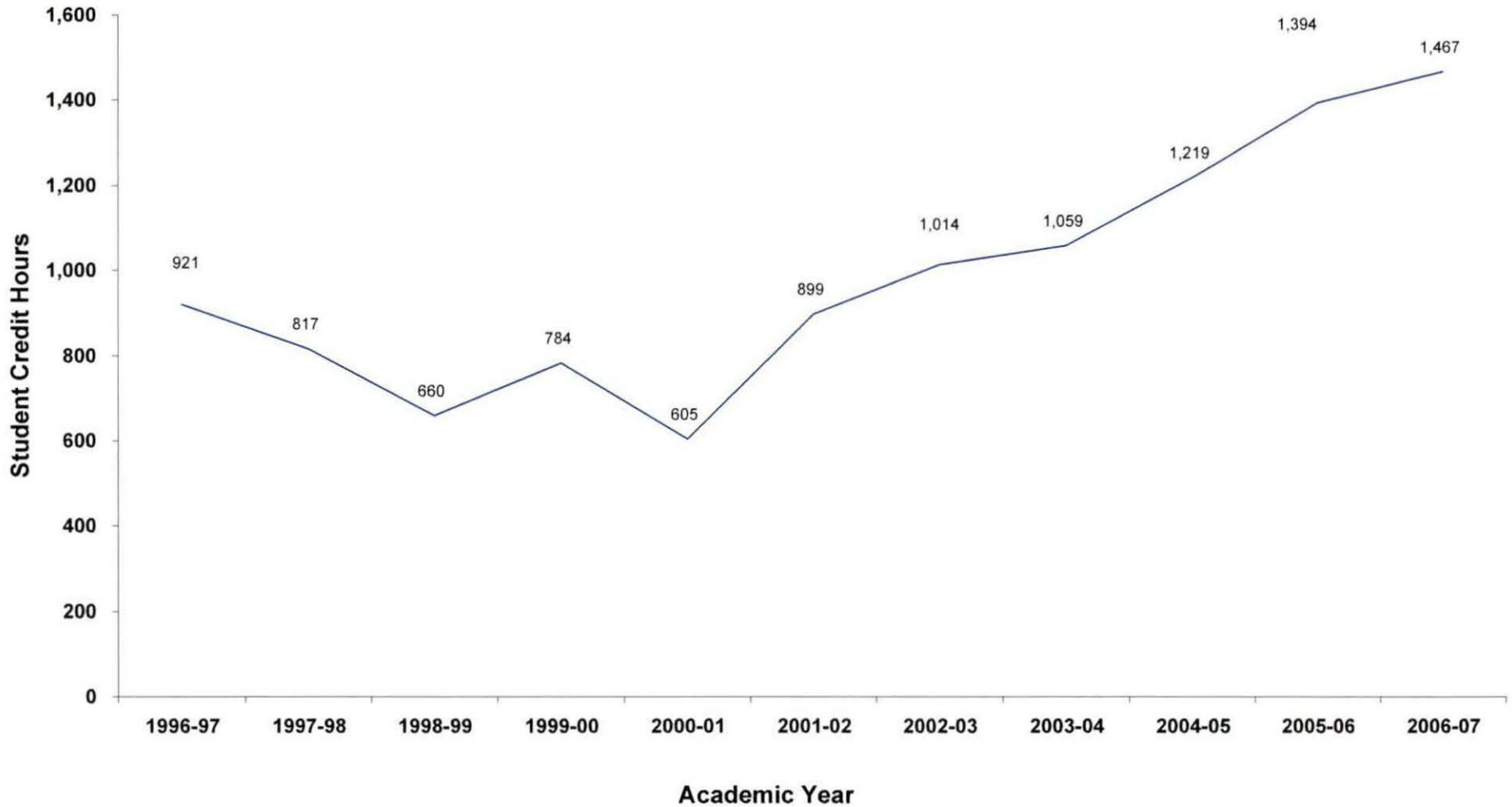
Oakland Community College Program Dashboard Report 2006-07

Architecture ARC Dashboard Score: 8.71

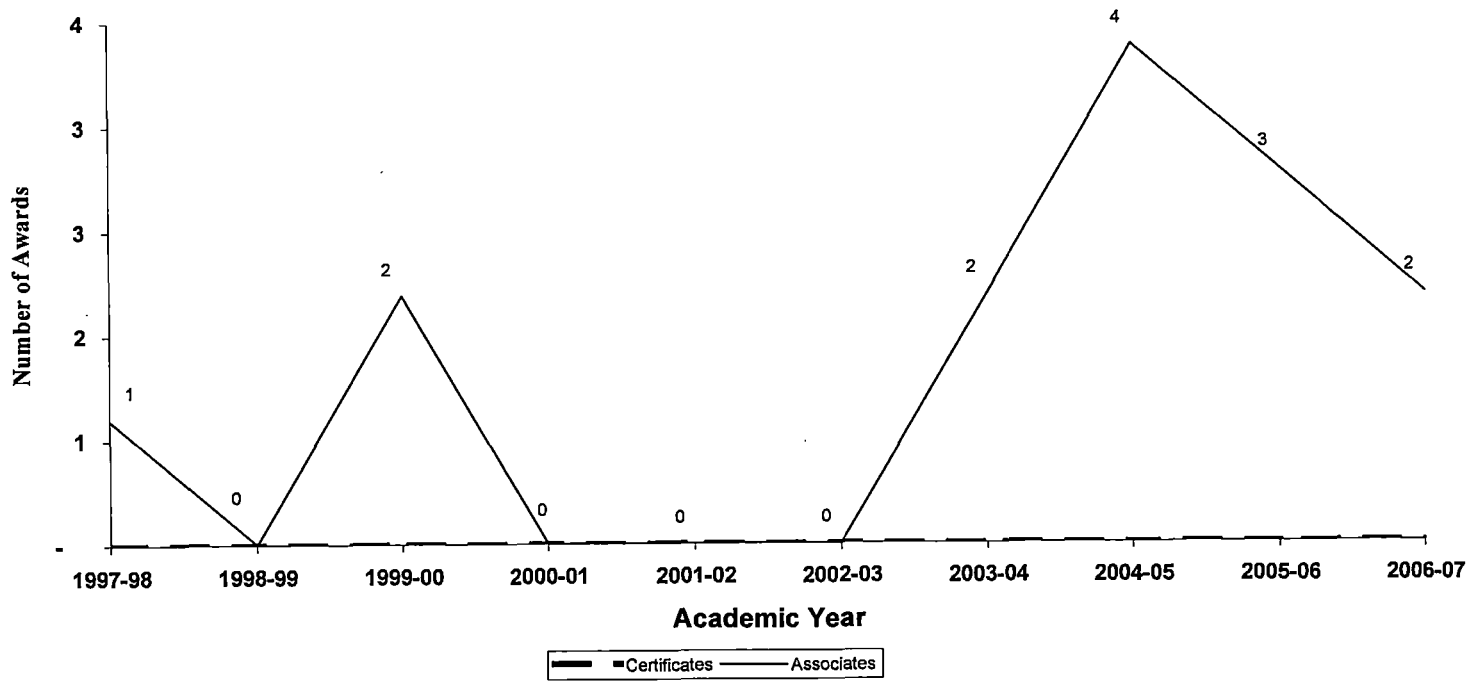
| Measures | Benchmarks | | | Percent of Target Achieved | Weight | Weighted Score |
|--------------------------------|------------------|------------------|-----------------|-------------------------------|--------|-------------------|
| | Current Score | Trouble Score | Target Score | | | |
| Sections Filled to Capacity | 72.3% | 75.0% | 90.0% | 80.3% | 18.0% | 1.45 |
| Percent of Completed Sections | 76.7% | 75.0% | 90.0% | 85.2% | 14.2% | 1.21 |
| Credit Hour Trend Ratio | 1.09 | 0.71 | 1.25 | 87.2% | 15.3% | 1.33 |
| Percent of Minority Students | 15.3% | 16.9% | 18.8% | 81.4% | 6.1% | 0.50 |
| Percent of Withdrawals | 17.7% | 15.0% | 0.0% | 82.3% | 12.0% | 0.99 |
| Percent of Incompletes | 1.8% | 3.0% | 0.0% | 98.2% | 7.9% | 0.78 |
| Student Course Completion Rate | 69.7% | 60.0% | 75.0% | 92.9% | 26.5% | 2.46 |

**Oakland Community College
Ten-Year Trend in Student Credit Hours
Architecture
1996-97 through 2006-07**

| | 1996-97 SCH | 1997-98 SCH | 1998-99 SCH | 1999-00 SCH | 2000-01 SCH | 2001-02 SCH | 2002-03 SCH | 2003-04 SCH | 2004-05 SCH | 2005-06 SCH | 2006-07 SCH | 5-Year % Change | 10-Year % Change |
|---------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|--------------------|---------------------|
| Architecture | 921 | 817 | 660 | 784 | 605 | 899 | 1,014 | 1,059 | 1,219 | 1,394 | 1,467 | 63.2 | 59.3 |
| College Wide Totals | 443,471 | 431,521 | 440,448 | 438,997 | 453,054 | 447,928 | 478,827 | 468,777 | 472,892 | 487,597 | 493,655 | 10.2 | 11.3 |



**Oakland Community College
Associate Degrees and Certificates Awarded
Architecture
1997-98 through 2006-07**



| <u>Academic Yr.</u> | <u>Certificates</u> | <u>Associates</u> |
|---------------------|---------------------|-------------------|
| 1997-98 | 0 | 1 |
| 1998-99 | 0 | 0 |
| 1999-00 | 0 | 2 |
| 2000-01 | 0 | 0 |
| 2001-02 | 0 | 0 |
| 2002-03 | 0 | 0 |
| 2003-04 | 0 | 2 |
| 2004-05 | 0 | 4 |
| 2005-06 | 0 | 3 |
| 2006-07 | 0 | 2 |

Occupational Projections (2007 – 2012)

The following projections are for those occupations most closely associated with this program based on national and regional sources. However, the extent to which specific OCC programs lead to employment within a given Standard Occupational Code (SOC) is dependent upon the way in which the U.S. Department of Labor groups specific occupations.

Occupational projections are presented at the "Detailed Standard Occupational Code" level as defined by the U.S. Department of Labor.

Although based on sound well tested economic modeling procedures, projections are subject to change based on emerging economic, political and social forces.

These projections reflect the four county region of Oakland, Macomb, Livingston and Wayne counties.

Projections are based on data from 24 major data sources, including the U.S. Department of Commerce, Bureau of Labor Statistics (BLS), Internal Revenue Service (IRS), and Census data. To forecast occupational demand at the county level, BLS data are regionalized and adjusted for emerging technological changes, the age of workers by occupation, and other factors affecting occupational demand.

Occupational forecast data was obtained from CCbenefits Inc. Community College Strategic Planner (CCSP).

Architecture Related Occupations (2007 - 2012)

SOC Detail Group

| SOC Code | Name | Base Year | Five Year | Job Change | Ind Mix Effect | Nat Gro Effect | Expct Chng | Compet Effect | Earnings Average | Earnings Median |
|----------------|--|-----------|-----------|------------|----------------|----------------|------------|---------------|------------------|-----------------|
| 17-1011 | Architects, except landscape and naval | 2,185 | 2,374 | 189 | 35 | 150 | 184 | 5 | \$33.19 | \$31.35 |
| 17-2051 | Civil engineers | 3,545 | 3,642 | 97 | -16 | 243 | 227 | -130 | \$29.07 | \$25.63 |
| 17-3011 | Architectural and civil drafters | 1,595 | 1,536 | -59 | -117 | 109 | -8 | -51 | \$20.25 | \$19.12 |
| 47-4011 | Construction and building inspectors | 2,301 | 2,524 | 223 | 71 | 158 | 228 | -6 | \$22.76 | \$22.50 |
| Totals: | | 9,626 | 10,076 | 450 | | | | | | |

Job Change- Column represents the addition of new jobs due to growth over the projection period. Indicates how many jobs will be added in the region over the selected time frame.

Industry Mix Effect- Column indicates how many of those jobs are due to movement within the industry at the national level. If the industry is growing across the nation, this is what is expected in the local area.

National Growth Effect- Column shows how the national economy affects the industry or occupation. This operates on the "rising tide carries all ships" assumption. If the economy is doing well, it is expected that this field in the region would benefit from that effect.

Expected Change- Column combines the Industry Mix Effect column and the National Growth Effect column to indicate how much the field is expected to grow in the region, without the input of variables within the economy. This is what is expected to happen if the local economy merely followed national trends.

By netting the Expected Change result out of the Job Change result, the Competitive Effect column shows the jobs that have been added in a field in the region due to growth specific to the region. These are the jobs created locally which aren't merely following national trends. A high Competitive Effect number indicates that the region has found some way to foster growth beyond other regions or even perhaps in spite of decline at the national level.

SOC Detail Definitions

SOC Code 17-1011

Name Architects, except landscape and naval

Definition

Plan and design structures, such as private residences, office buildings, theaters, factories, and other structural property.

Examples

Architectural Designer, Building Consultant, Site Planner

SOC Code 17-2051

Name Civil engineers

Definition

Perform engineering duties in planning, designing, and overseeing construction and maintenance of building structures, and facilities, such as roads, railroads, airports, bridges, harbors, channels, dams, irrigation projects, pipelines, power plants, water and sewage systems, and waste disposal units. Include architectural, structural, traffic, ocean, and geo-technical engineers. Exclude "Hydrologists" (19-2043).

Examples

Bridge Engineer, Construction Engineer, Concrete Engineer

SOC Code 17-3011

Name Architectural and civil drafters

Definition

Prepare detailed drawings of architectural and structural features of buildings or drawings and topographical relief maps used in civil engineering projects, such as highways, bridges, and public works. Utilize knowledge of building materials, engineering practices, and mathematics to complete drawings.

Examples

Structural Drafter

SOC Detail Definitions

SOC Code 47-4011

Name Construction and building inspectors

Definition

Inspect structures using engineering skills to determine structural soundness and compliance with specifications, building codes, and other regulations. Inspections may be general in nature or may be limited to a specific area, such as electrical systems or plumbing.

Examples

Highway Inspector, Electrical Inspector, Architectural Inspector

Occupational Skills Analysis

The following report provides detailed information on the knowledge, skills and abilities required for a given occupation. Consideration of these different competencies and levels of attainment while designing and reviewing curriculum will ensure that students enrolled in our programs are adequately prepared for employment.

In particular this report provides:

Importance of the competency to the occupation (in general terms)

- Not important
- Somewhat important
- Important
- Very important
- Extremely important

Importance of the competency to the occupation (in specific terms).

- 0 to 20 = not important
- 21 to 40 = somewhat important
- 41 to 60 = important
- 61 to 80 = very important
- 81 to 100 = extremely important

Level of Attainment in the competency required by the occupation:

- Basic = 0 to 24
- Intermediate = 25 to 49
- Advanced = 50 to 74
- Expert = 75 to 100

Occupational Skills Analysis
Architects, Except Landscape and Naval (17-1011.00)

Plan and design structures, such as private residences, office buildings, theaters, factories, and other structural property.

Occupational Knowledge

| Knowledge | Importance | Imp (0-100) | Level | Lvl (0-100) |
|-------------------------------|--------------------|-------------|--------------|-------------|
| Building and Construction | Very Important | 97 | Expert | 91 |
| Design | Very Important | 94 | Expert | 90 |
| Engineering and Technology | Important | 72 | Expert | 78 |
| Mathematics | Important | 66 | Advanced | 66 |
| English Language | Important | 67 | Advanced | 64 |
| Law and Government | Important | 57 | Advanced | 63 |
| Public Safety and Security | Important | 59 | Advanced | 61 |
| Administration and Management | Important | 66 | Advanced | 60 |
| Customer and Personal Service | Important | 62 | Advanced | 59 |
| Computers and Electronics | Important | 65 | Advanced | 58 |
| Clerical | Important | 50 | Advanced | 55 |
| Physics | Somewhat Important | 40 | Advanced | 53 |
| Mechanical | Somewhat Important | 49 | Advanced | 51 |
| Fine Arts | Somewhat Important | 38 | Intermediate | 49 |
| Education and Training | Somewhat Important | 42 | Intermediate | 45 |
| Production and Processing | Somewhat Important | 38 | Intermediate | 44 |
| Sales and Marketing | Important | 50 | Intermediate | 44 |
| Geography | Somewhat Important | 32 | Intermediate | 42 |
| Communications and Media | Somewhat Important | 44 | Intermediate | 40 |
| History and Archeology | Somewhat Important | 31 | Intermediate | 37 |
| Psychology | Somewhat Important | 30 | Intermediate | 36 |
| Economics and Accounting | Somewhat Important | 43 | Intermediate | 32 |
| Personnel and Human Resources | Somewhat Important | 34 | Intermediate | 31 |
| Chemistry | Not Important | 23 | Intermediate | 30 |
| Telecommunications | Somewhat Important | 35 | Intermediate | 29 |
| Sociology and Anthropology | Not Important | 19 | Intermediate | 27 |
| Transportation | Not Important | 18 | Intermediate | 27 |
| Biology | Not Important | 18 | Basic | 23 |
| Philosophy and Theology | Not Important | 14 | Basic | 18 |
| Foreign Language | Not Important | 4 | Basic | 4 |
| Medicine and Dentistry | Not Important | 3 | Basic | 3 |
| Therapy and Counseling | Not Important | 3 | Basic | 3 |
| Food Production | Not Important | 2 | Basic | 1 |

Source: O*NET Database 11

Occupational Skills

| Skill | Importance | Imp (0-100) | Level | Lvl (0-100) |
|-----------------------------------|--------------------|-------------|--------------|-------------|
| Coordination | Very Important | 77 | Expert | 85 |
| Complex Problem Solving | Very Important | 83 | Expert | 80 |
| Operations Analysis | Important | 71 | Expert | 79 |
| Active Listening | Very Important | 91 | Expert | 78 |
| Critical Thinking | Very Important | 86 | Expert | 75 |
| Active Learning | Important | 70 | Expert | 75 |
| Writing | Very Important | 75 | Advanced | 74 |
| Monitoring | Important | 61 | Advanced | 71 |
| Reading Comprehension | Very Important | 81 | Advanced | 71 |
| Speaking | Important | 74 | Advanced | 70 |
| Time Management | Very Important | 82 | Advanced | 70 |
| Persuasion | Important | 59 | Advanced | 68 |
| Management of Personnel Resources | Very Important | 80 | Advanced | 67 |
| Negotiation | Important | 57 | Advanced | 67 |
| Management of Financial Resources | Important | 58 | Advanced | 66 |
| Judgment and Decision Making | Important | 68 | Advanced | 66 |
| Mathematics | Important | 63 | Advanced | 65 |
| Instructing | Important | 53 | Advanced | 63 |
| Learning Strategies | Important | 52 | Advanced | 63 |
| Service Orientation | Somewhat Important | 49 | Advanced | 61 |
| Social Perceptiveness | Important | 52 | Advanced | 58 |
| Quality Control Analysis | Important | 57 | Advanced | 58 |
| Science | Somewhat Important | 46 | Advanced | 51 |
| Technology Design | Somewhat Important | 41 | Advanced | 50 |
| Equipment Selection | Somewhat Important | 35 | Advanced | 50 |
| Management of Material Resources | Somewhat Important | 37 | Intermediate | 48 |
| Troubleshooting | Important | 51 | Intermediate | 45 |
| Systems Evaluation | Somewhat Important | 38 | Intermediate | 44 |
| Systems Analysis | Somewhat Important | 35 | Intermediate | 42 |
| Operation and Control | Not Important | 14 | Basic | 18 |
| Repairing | Not Important | 16 | Basic | 18 |
| Installation | Not Important | 14 | Basic | 16 |
| Equipment Maintenance | Not Important | 12 | Basic | 13 |
| Operation Monitoring | Not Important | 5 | Basic | 7 |
| Programming | Not Important | 4 | Basic | 6 |

Source: O*NET Database 11

Occupational Abilities

| Ability | Importance | Imp (0-100) | Level | Lvl (0-100) |
|-----------------------------|--------------------|-------------|--------------|-------------|
| Deductive Reasoning | Important | 69 | Advanced | 71 |
| Oral Expression | Very Important | 81 | Advanced | 68 |
| Visualization | Important | 69 | Advanced | 66 |
| Near Vision | Very Important | 75 | Advanced | 64 |
| Fluency of Ideas | Important | 60 | Advanced | 63 |
| Originality | Important | 66 | Advanced | 63 |
| Oral Comprehension | Very Important | 81 | Advanced | 63 |
| Information Ordering | Important | 72 | Advanced | 61 |
| Category Flexibility | Important | 63 | Advanced | 61 |
| Written Expression | Important | 72 | Advanced | 59 |
| Written Comprehension | Important | 66 | Advanced | 59 |
| Problem Sensitivity | Very Important | 75 | Advanced | 57 |
| Inductive Reasoning | Important | 60 | Advanced | 55 |
| Speech Recognition | Important | 69 | Advanced | 50 |
| Far Vision | Somewhat Important | 44 | Intermediate | 48 |
| Speech Clarity | Important | 72 | Intermediate | 48 |
| Finger Dexterity | Important | 53 | Intermediate | 46 |
| Mathematical Reasoning | Somewhat Important | 41 | Intermediate | 46 |
| Flexibility of Closure | Somewhat Important | 38 | Intermediate | 41 |
| Visual Color Discrimination | Somewhat Important | 44 | Intermediate | 41 |
| Number Facility | Somewhat Important | 35 | Intermediate | 41 |
| Selective Attention | Important | 53 | Intermediate | 41 |
| Control Precision | Somewhat Important | 35 | Intermediate | 39 |
| Arm-Hand Steadiness | Somewhat Important | 47 | Intermediate | 39 |
| Memorization | Somewhat Important | 35 | Intermediate | 38 |
| Auditory Attention | Somewhat Important | 28 | Intermediate | 36 |
| Time Sharing | Somewhat Important | 31 | Intermediate | 34 |
| Speed of Closure | Somewhat Important | 28 | Intermediate | 34 |
| Depth Perception | Somewhat Important | 38 | Intermediate | 32 |
| Perceptual Speed | Somewhat Important | 25 | Intermediate | 27 |
| Manual Dexterity | Somewhat Important | 35 | Intermediate | 25 |
| Multilimb Coordination | Not Important | 22 | Basic | 23 |
| Trunk Strength | Not Important | 13 | Basic | 14 |
| Spatial Orientation | Not Important | 13 | Basic | 13 |
| Hearing Sensitivity | Not Important | 13 | Basic | 11 |
| Wrist-Finger Speed | Not Important | 3 | Basic | 5 |
| Reaction Time | Not Important | 0 | Basic | 0 |
| Stamina | Not Important | 0 | Basic | 0 |
| Extent Flexibility | Not Important | 0 | Basic | 0 |
| Sound Localization | Not Important | 0 | Basic | 0 |
| Speed of Limb Movement | Not Important | 0 | Basic | 0 |
| Night Vision | Not Important | 0 | Basic | 0 |
| Dynamic Flexibility | Not Important | 0 | Basic | 0 |
| Static Strength | Not Important | 0 | Basic | 0 |
| Peripheral Vision | Not Important | 0 | Basic | 0 |
| Gross Body Coordination | Not Important | 0 | Basic | 0 |
| Explosive Strength | Not Important | 0 | Basic | 0 |
| Response Orientation | Not Important | 0 | Basic | 0 |
| Gross Body Equilibrium | Not Important | 0 | Basic | 0 |
| Dynamic Strength | Not Important | 0 | Basic | 0 |
| Glare Sensitivity | Not Important | 0 | Basic | 0 |
| Rate Control | Not Important | 0 | Basic | 0 |

Source: O*NET Database 11

**Occupational Skills Analysis
Civil Engineers (17-2051.00)**

Perform engineering duties in planning, designing, and overseeing construction and maintenance of building structures, and facilities, such as roads, railroads, airports, bridges, harbors, channels, dams, irrigation projects, pipelines, power plants, water and sewage systems, and waste disposal units. Includes architectural, structural, traffic, ocean, and geo-technical engineers.

Occupational Knowledge

| Knowledge | Importance | Imp (0-100) | Level | Lvl (0-100) |
|-------------------------------|--------------------|-------------|--------------|-------------|
| Engineering and Technology | Very Important | 97 | Expert | 89 |
| Design | Very Important | 93 | Expert | 84 |
| Mathematics | Very Important | 89 | Advanced | 72 |
| Customer and Personal Service | Important | 65 | Advanced | 67 |
| Architecture and Construction | Very Important | 80 | Advanced | 66 |
| English Language | Important | 66 | Advanced | 55 |
| Administration and Management | Important | 62 | Advanced | 54 |
| Computers and Electronics | Important | 50 | Advanced | 52 |
| Physics | Somewhat Important | 45 | Advanced | 50 |
| Law and Government | Somewhat Important | 48 | Intermediate | 49 |
| Clerical | Somewhat Important | 46 | Intermediate | 49 |
| Personnel and Human Resources | Important | 50 | Intermediate | 48 |
| Public Safety and Security | Important | 54 | Intermediate | 48 |
| Sales and Marketing | Somewhat Important | 33 | Intermediate | 46 |
| Transportation | Important | 58 | Intermediate | 46 |
| Education and Training | Somewhat Important | 39 | Intermediate | 42 |
| Geography | Somewhat Important | 32 | Intermediate | 38 |
| Geography | Somewhat Important | 48 | Intermediate | 38 |
| Economics and Accounting | Somewhat Important | 30 | Intermediate | 36 |
| Mechanical | Somewhat Important | 32 | Intermediate | 31 |
| Psychology | Somewhat Important | 20 | Intermediate | 30 |
| Chemistry | Not Important | 22 | Intermediate | 28 |
| Chemistry | Not Important | 30 | Intermediate | 28 |
| Biology | Somewhat Important | 22 | Basic | 19 |
| Communications and Media | Not Important | 13 | Basic | 14 |
| Production and Processing | Not Important | 9 | Basic | 12 |
| Telecommunications | Not Important | 9 | Basic | 11 |
| Philosophy and Theology | Not Important | 9 | Basic | 10 |
| History and Archeology | Not Important | 9 | Basic | 10 |
| Therapy and Counseling | Not Important | 10 | Basic | 9 |
| Sociology and Anthropology | Not Important | 3 | Basic | 3 |
| Foreign Language | Not Important | 2 | Basic | 2 |
| Food Production | Not Important | 2 | Basic | 1 |
| Medicine and Dentistry | Not Important | 0 | Basic | 0 |
| Fine Arts | Not Important | | | |

Source: O*NET Database 11

Occupational Skills

| Skill | Importance | Imp (0-100) | Level | Lvl (0-100) |
|-----------------------------------|--------------------|-------------|--------------|-------------|
| Coordination | Important | 74 | Expert | 86 |
| Mathematics | Very Important | 95 | Expert | 84 |
| Reading Comprehension | Very Important | 81 | Expert | 82 |
| Active Listening | Very Important | 82 | Expert | 79 |
| Monitoring | Very Important | 77 | Expert | 79 |
| Writing | Important | 74 | Expert | 77 |
| Active Learning | Very Important | 80 | Expert | 77 |
| Complex Problem Solving | Very Important | 78 | Expert | 77 |
| Instructing | Important | 66 | Expert | 76 |
| Judgment and Decision Making | Very Important | 75 | Expert | 76 |
| Critical Thinking | Very Important | 86 | Expert | 75 |
| Persuasion | Important | 67 | Advanced | 74 |
| Science | Very Important | 86 | Advanced | 72 |
| Operations Analysis | Important | 69 | Advanced | 71 |
| Negotiation | Very Important | 75 | Advanced | 70 |
| Time Management | Important | 73 | Advanced | 69 |
| Equipment Selection | Important | 62 | Advanced | 69 |
| Learning Strategies | Important | 62 | Advanced | 68 |
| Service Orientation | Important | 69 | Advanced | 67 |
| Speaking | Important | 67 | Advanced | 66 |
| Social Perceptiveness | Important | 69 | Advanced | 65 |
| Technology Design | Important | 66 | Advanced | 60 |
| Quality Control Analysis | Important | 61 | Advanced | 60 |
| Troubleshooting | Important | 58 | Advanced | 58 |
| Installation | Somewhat Important | 45 | Advanced | 55 |
| Management of Personnel Resources | Important | 57 | Advanced | 53 |
| Systems Evaluation | Important | 51 | Advanced | 52 |
| Management of Financial Resources | Somewhat Important | 46 | Advanced | 51 |
| Systems Analysis | Somewhat Important | 49 | Advanced | 50 |
| Operation Monitoring | Somewhat Important | 39 | Intermediate | 48 |
| Operation and Control | Somewhat Important | 48 | Intermediate | 47 |
| Management of Material Resources | Somewhat Important | 36 | Intermediate | 40 |
| Programming | Somewhat Important | 36 | Intermediate | 38 |
| Equipment Maintenance | Somewhat Important | 26 | Intermediate | 30 |
| Repairing | Not Important | 19 | Intermediate | 29 |

Source: O*NET Database 11

Occupational Abilities

| Ability | Importance | Imp (0-100) | Level | Lvl (0-100) |
|-----------------------------|--------------------|-------------|--------------|-------------|
| Deductive Reasoning | Very Important | 75 | Expert | 75 |
| Information Ordering | Important | 69 | Advanced | 68 |
| Visualization | Important | 69 | Advanced | 68 |
| Problem Sensitivity | Very Important | 75 | Advanced | 68 |
| Written Comprehension | Important | 72 | Advanced | 68 |
| Oral Expression | Very Important | 75 | Advanced | 66 |
| Oral Comprehension | Important | 72 | Advanced | 66 |
| Inductive Reasoning | Important | 66 | Advanced | 66 |
| Written Expression | Important | 60 | Advanced | 64 |
| Originality | Important | 66 | Advanced | 64 |
| Near Vision | Important | 72 | Advanced | 64 |
| Fluency of Ideas | Important | 60 | Advanced | 63 |
| Category Flexibility | Important | 53 | Advanced | 61 |
| Mathematical Reasoning | Important | 56 | Advanced | 61 |
| Speed of Closure | Somewhat Important | 44 | Advanced | 61 |
| Number Facility | Somewhat Important | 41 | Advanced | 59 |
| Far Vision | Important | 50 | Advanced | 54 |
| Auditory Attention | Somewhat Important | 31 | Advanced | 52 |
| Selective Attention | Important | 56 | Advanced | 50 |
| Speech Clarity | Important | 69 | Advanced | 50 |
| Flexibility of Closure | Important | 50 | Intermediate | 48 |
| Speech Recognition | Important | 60 | Intermediate | 48 |
| Memorization | Somewhat Important | 38 | Intermediate | 48 |
| Perceptual Speed | Somewhat Important | 38 | Intermediate | 45 |
| Control Precision | Somewhat Important | 41 | Intermediate | 45 |
| Time Sharing | Somewhat Important | 41 | Intermediate | 43 |
| Finger Dexterity | Somewhat Important | 47 | Intermediate | 41 |
| Visual Color Discrimination | Somewhat Important | 44 | Intermediate | 38 |
| Depth Perception | Somewhat Important | 47 | Intermediate | 36 |
| Arm-Hand Steadiness | Somewhat Important | 35 | Intermediate | 36 |
| Reaction Time | Not Important | 22 | Intermediate | 30 |
| Multilimb Coordination | Somewhat Important | 41 | Intermediate | 30 |
| Manual Dexterity | Somewhat Important | 28 | Intermediate | 25 |
| Hearing Sensitivity | Somewhat Important | 25 | Basic | 20 |
| Spatial Orientation | Not Important | 22 | Basic | 20 |
| Trunk Strength | Not Important | 16 | Basic | 16 |
| Wrist-Finger Speed | Not Important | 6 | Basic | 13 |
| Extent Flexibility | Not Important | 9 | Basic | 9 |
| Response Orientation | Not Important | 6 | Basic | 7 |
| Dynamic Strength | Not Important | 6 | Basic | 7 |
| Stamina | Not Important | 6 | Basic | 5 |
| Speed of Limb Movement | Not Important | 3 | Basic | 5 |
| Dynamic Flexibility | Not Important | 3 | Basic | 5 |
| Static Strength | Not Important | 6 | Basic | 5 |
| Gross Body Coordination | Not Important | 6 | Basic | 5 |
| Gross Body Equilibrium | Not Important | 3 | Basic | 5 |
| Peripheral Vision | Not Important | 9 | Basic | 4 |
| Rate Control | Not Important | 3 | Basic | 4 |
| Sound Localization | Not Important | 3 | Basic | 2 |
| Night Vision | Not Important | 0 | Basic | 0 |
| Explosive Strength | Not Important | 0 | Basic | 0 |
| Glare Sensitivity | Not Important | 0 | Basic | 0 |

Source: O*NET Database 11

**Occupational Skills Analysis
Architectural Drafters (17-3011.01)**

Prepare detailed drawings of architectural designs and plans for buildings and structures according to specifications provided by architect.

Occupational Knowledge

| Knowledge | Importance | Imp (0-100) | Level | Lvl (0-100) |
|-------------------------------|--------------------|-------------|--------------|-------------|
| Design | Very Important | 86 | Expert | 80 |
| Building and Construction | Very Important | 77 | Advanced | 72 |
| Computers and Electronics | Important | 67 | Advanced | 64 |
| Mathematics | Important | 69 | Advanced | 64 |
| Customer and Personal Service | Important | 57 | Advanced | 56 |
| Engineering and Technology | Important | 59 | Advanced | 53 |
| Clerical | Somewhat Important | 40 | Advanced | 50 |
| English Language | Important | 63 | Intermediate | 49 |
| Public Safety and Security | Important | 55 | Intermediate | 48 |
| Administration and Management | Somewhat Important | 46 | Intermediate | 47 |
| Law and Government | Somewhat Important | 45 | Intermediate | 40 |
| Geography | Somewhat Important | 31 | Intermediate | 38 |
| Sales and Marketing | Somewhat Important | 30 | Intermediate | 38 |
| Psychology | Somewhat Important | 31 | Intermediate | 37 |
| Physics | Somewhat Important | 43 | Intermediate | 37 |
| Production and Processing | Somewhat Important | 41 | Intermediate | 35 |
| Mechanical | Somewhat Important | 38 | Intermediate | 34 |
| Education and Training | Somewhat Important | 31 | Intermediate | 34 |
| Fine Arts | Somewhat Important | 29 | Intermediate | 33 |
| Personnel and Human Resources | Somewhat Important | 25 | Intermediate | 30 |
| Communications and Media | Somewhat Important | 26 | Intermediate | 29 |
| Philosophy and Theology | Not Important | 19 | Intermediate | 27 |
| Telecommunications | Somewhat Important | 29 | Intermediate | 26 |
| Sociology and Anthropology | Not Important | 23 | Intermediate | 26 |
| History and Archeology | Somewhat Important | 27 | Basic | 24 |
| Transportation | Not Important | 21 | Basic | 22 |
| Economics and Accounting | Not Important | 23 | Basic | 19 |
| Foreign Language | Not Important | 17 | Basic | 14 |
| Chemistry | Not Important | 15 | Basic | 14 |
| Medicine and Dentistry | Not Important | 10 | Basic | 11 |
| Therapy and Counseling | Not Important | 12 | Basic | 11 |
| Food Production | Not Important | 4 | Basic | 5 |
| Biology | Not Important | 3 | Basic | 4 |

Source: O*NET Database 11

Occupational Skills

| Skill | Importance | Imp (0-100) | Level | Lvl (0-100) |
|-----------------------------------|--------------------|-------------|--------------|-------------|
| Coordination | Very Important | 82 | Expert | 80 |
| Active Learning | Very Important | 79 | Expert | 80 |
| Reading Comprehension | Very Important | 75 | Advanced | 72 |
| Active Listening | Very Important | 86 | Advanced | 71 |
| Critical Thinking | Very Important | 75 | Advanced | 71 |
| Monitoring | Important | 68 | Advanced | 69 |
| Mathematics | Very Important | 76 | Advanced | 68 |
| Speaking | Important | 70 | Advanced | 67 |
| Operations Analysis | Important | 71 | Advanced | 67 |
| Complex Problem Solving | Very Important | 77 | Advanced | 67 |
| Instructing | Important | 70 | Advanced | 62 |
| Learning Strategies | Important | 65 | Advanced | 62 |
| Persuasion | Important | 51 | Advanced | 59 |
| Writing | Important | 59 | Advanced | 59 |
| Time Management | Important | 70 | Advanced | 58 |
| Service Orientation | Important | 51 | Advanced | 58 |
| Social Perceptiveness | Important | 52 | Advanced | 55 |
| Technology Design | Important | 60 | Advanced | 52 |
| Equipment Selection | Somewhat Important | 44 | Advanced | 50 |
| Quality Control Analysis | Somewhat Important | 49 | Intermediate | 49 |
| Negotiation | Somewhat Important | 42 | Intermediate | 47 |
| Judgment and Decision Making | Somewhat Important | 45 | Intermediate | 46 |
| Science | Somewhat Important | 48 | Intermediate | 45 |
| Systems Evaluation | Somewhat Important | 39 | Intermediate | 40 |
| Systems Analysis | Somewhat Important | 38 | Intermediate | 36 |
| Management of Financial Resources | Somewhat Important | 32 | Intermediate | 32 |
| Management of Personnel Resources | Somewhat Important | 33 | Intermediate | 32 |
| Troubleshooting | Somewhat Important | 32 | Intermediate | 32 |
| Management of Material Resources | Not Important | 24 | Intermediate | 29 |
| Installation | Somewhat Important | 28 | Intermediate | 28 |
| Programming | Somewhat Important | 25 | Intermediate | 27 |
| Operation and Control | Not Important | 23 | Intermediate | 25 |
| Operation Monitoring | Not Important | 15 | Basic | 18 |
| Equipment Maintenance | Not Important | 13 | Basic | 14 |
| Repairing | Not Important | 6 | Basic | 10 |

Source: O*NET Database 11

Occupational Abilities

| Ability | Importance | Imp (0-100) | Level | Lvl (0-100) |
|-----------------------------|--------------------|-------------|--------------|-------------|
| Visualization | Very Important | 81 | Advanced | 70 |
| Deductive Reasoning | Very Important | 78 | Advanced | 68 |
| Near Vision | Important | 72 | Advanced | 68 |
| Information Ordering | Important | 72 | Advanced | 64 |
| Oral Comprehension | Important | 66 | Advanced | 64 |
| Oral Expression | Important | 63 | Advanced | 63 |
| Written Comprehension | Important | 63 | Advanced | 63 |
| Written Expression | Important | 60 | Advanced | 57 |
| Originality | Important | 63 | Advanced | 57 |
| Problem Sensitivity | Important | 63 | Advanced | 57 |
| Mathematical Reasoning | Important | 53 | Advanced | 55 |
| Inductive Reasoning | Important | 69 | Advanced | 55 |
| Fluency of Ideas | Important | 53 | Advanced | 54 |
| Far Vision | Somewhat Important | 44 | Advanced | 52 |
| Category Flexibility | Important | 53 | Advanced | 52 |
| Flexibility of Closure | Somewhat Important | 41 | Advanced | 50 |
| Visual Color Discrimination | Important | 53 | Advanced | 50 |
| Finger Dexterity | Important | 66 | Advanced | 50 |
| Number Facility | Somewhat Important | 35 | Intermediate | 48 |
| Arm-Hand Steadiness | Important | 63 | Intermediate | 48 |
| Memorization | Somewhat Important | 38 | Intermediate | 46 |
| Speech Recognition | Important | 50 | Intermediate | 45 |
| Speech Clarity | Important | 53 | Intermediate | 45 |
| Manual Dexterity | Somewhat Important | 44 | Intermediate | 43 |
| Perceptual Speed | Somewhat Important | 31 | Intermediate | 41 |
| Control Precision | Somewhat Important | 35 | Intermediate | 41 |
| Selective Attention | Important | 56 | Intermediate | 41 |
| Speed of Closure | Somewhat Important | 35 | Intermediate | 41 |
| Auditory Attention | Somewhat Important | 28 | Intermediate | 39 |
| Time Sharing | Somewhat Important | 31 | Intermediate | 39 |
| Depth Perception | Somewhat Important | 41 | Intermediate | 38 |
| Wrist-Finger Speed | Not Important | 19 | Basic | 21 |
| Multilimb Coordination | Not Important | 22 | Basic | 20 |
| Trunk Strength | Not Important | 19 | Basic | 14 |
| Spatial Orientation | Not Important | 19 | Basic | 14 |
| Hearing Sensitivity | Not Important | 16 | Basic | 13 |
| Reaction Time | Not Important | 13 | Basic | 13 |
| Response Orientation | Not Important | 9 | Basic | 11 |
| Rate Control | Not Important | 9 | Basic | 7 |
| Extent Flexibility | Not Important | 3 | Basic | 2 |
| Stamina | Not Important | 0 | Basic | 0 |
| Sound Localization | Not Important | 0 | Basic | 0 |
| Speed of Limb Movement | Not Important | 0 | Basic | 0 |
| Night Vision | Not Important | 0 | Basic | 0 |
| Dynamic Flexibility | Not Important | 0 | Basic | 0 |
| Static Strength | Not Important | 0 | Basic | 0 |
| Peripheral Vision | Not Important | 0 | Basic | 0 |
| Gross Body Coordination | Not Important | 0 | Basic | 0 |
| Explosive Strength | Not Important | 0 | Basic | 0 |
| Gross Body Equilibrium | Not Important | 0 | Basic | 0 |
| Dynamic Strength | Not Important | 0 | Basic | 0 |
| Glare Sensitivity | Not Important | 0 | Basic | 0 |

Source: O*NET Database 11

**Occupational Skills Analysis
Civil Drafters (17-3011.02)**

Prepare drawings and topographical and relief maps used in civil engineering projects, such as highways, bridges, pipelines, flood control projects, and water and sewerage control systems.

Occupational Knowledge

| Knowledge | Importance | Imp (0-100) | Level | Lvl (0-100) |
|-------------------------------|--------------------|-------------|--------------|-------------|
| Design | Very Important | 75 | Advanced | 72 |
| Engineering and Technology | Important | 74 | Advanced | 69 |
| Mathematics | Very Important | 76 | Advanced | 68 |
| Computers and Electronics | Very Important | 83 | Advanced | 66 |
| English Language | Important | 59 | Advanced | 55 |
| Geography | Important | 53 | Advanced | 51 |
| Public Safety and Security | Somewhat Important | 44 | Intermediate | 47 |
| Law and Government | Somewhat Important | 44 | Intermediate | 47 |
| Education and Training | Somewhat Important | 35 | Intermediate | 45 |
| Building and Construction | Somewhat Important | 39 | Intermediate | 35 |
| Physics | Somewhat Important | 30 | Intermediate | 32 |
| Transportation | Somewhat Important | 36 | Intermediate | 30 |
| Communications and Media | Somewhat Important | 29 | Intermediate | 30 |
| Mechanical | Somewhat Important | 26 | Intermediate | 29 |
| Administration and Management | Not Important | 22 | Intermediate | 27 |
| Customer and Personal Service | Not Important | 22 | Intermediate | 26 |
| Clerical | Somewhat Important | 25 | Basic | 24 |
| Personnel and Human Resources | Not Important | 14 | Basic | 17 |
| Production and Processing | Not Important | 15 | Basic | 15 |
| Chemistry | Not Important | 14 | Basic | 14 |
| Telecommunications | Not Important | 9 | Basic | 7 |
| Biology | Not Important | 6 | Basic | 6 |
| Psychology | Not Important | 8 | Basic | 6 |
| Economics and Accounting | Not Important | 4 | Basic | 3 |
| Sales and Marketing | Not Important | 4 | Basic | 3 |
| Sociology and Anthropology | Not Important | 2 | Basic | 3 |
| History and Archeology | Not Important | 1 | Basic | 2 |
| Philosophy and Theology | Not Important | 1 | Basic | 2 |
| Fine Arts | Not Important | 1 | Basic | 1 |
| Foreign Language | Not Important | 1 | Basic | 1 |
| Food Production | Not Important | 0 | Basic | 0 |
| Medicine and Dentistry | Not Important | 0 | Basic | 0 |
| Therapy and Counseling | Not Important | 0 | Basic | 0 |

Source: O*NET Database 11

Occupational Skills

| Skill | Importance | Imp (0-100) | Level | Lvl (0-100) |
|-----------------------------------|--------------------|-------------|--------------|-------------|
| Mathematics | Important | 68 | Advanced | 68 |
| Coordination | Important | 53 | Advanced | 60 |
| Active Learning | Important | 63 | Advanced | 60 |
| Active Listening | Important | 65 | Advanced | 59 |
| Reading Comprehension | Important | 57 | Advanced | 56 |
| Instructing | Somewhat Important | 46 | Advanced | 55 |
| Critical Thinking | Important | 57 | Advanced | 55 |
| Time Management | Important | 63 | Advanced | 52 |
| Operations Analysis | Somewhat Important | 39 | Intermediate | 49 |
| Learning Strategies | Somewhat Important | 42 | Intermediate | 48 |
| Writing | Somewhat Important | 37 | Intermediate | 47 |
| Speaking | Important | 50 | Intermediate | 47 |
| Complex Problem Solving | Somewhat Important | 41 | Intermediate | 47 |
| Equipment Selection | Somewhat Important | 37 | Intermediate | 42 |
| Monitoring | Somewhat Important | 34 | Intermediate | 42 |
| Troubleshooting | Somewhat Important | 36 | Intermediate | 40 |
| Technology Design | Somewhat Important | 33 | Intermediate | 38 |
| Service Orientation | Somewhat Important | 35 | Intermediate | 37 |
| Judgment and Decision Making | Somewhat Important | 41 | Intermediate | 35 |
| Social Perceptiveness | Somewhat Important | 31 | Intermediate | 34 |
| Operation and Control | Somewhat Important | 30 | Intermediate | 31 |
| Persuasion | Somewhat Important | 26 | Intermediate | 30 |
| Equipment Maintenance | Not Important | 24 | Intermediate | 26 |
| Science | Not Important | 22 | Intermediate | 25 |
| Installation | Somewhat Important | 26 | Intermediate | 25 |
| Quality Control Analysis | Somewhat Important | 28 | Basic | 24 |
| Negotiation | Not Important | 21 | Basic | 21 |
| Programming | Not Important | 16 | Basic | 18 |
| Repairing | Not Important | 13 | Basic | 18 |
| Management of Personnel Resources | Not Important | 18 | Basic | 17 |
| Management of Material Resources | Not Important | 19 | Basic | 16 |
| Operation Monitoring | Not Important | 12 | Basic | 15 |
| Systems Analysis | Not Important | 10 | Basic | 11 |
| Management of Financial Resources | Not Important | 8 | Basic | 8 |
| Systems Evaluation | Not Important | 6 | Basic | 6 |

Source: O*NET Database 11

Occupational Abilities

| Ability | Importance | Imp (0-100) | Level | Lvl (0-100) |
|-----------------------------|--------------------|-------------|--------------|-------------|
| Visualization | Very Important | 75 | Advanced | 71 |
| Near Vision | Very Important | 81 | Advanced | 71 |
| Oral Comprehension | Important | 69 | Advanced | 70 |
| Oral Expression | Important | 66 | Advanced | 68 |
| Written Comprehension | Very Important | 75 | Advanced | 68 |
| Problem Sensitivity | Important | 72 | Advanced | 64 |
| Mathematical Reasoning | Important | 66 | Advanced | 63 |
| Flexibility of Closure | Important | 72 | Advanced | 61 |
| Number Facility | Important | 56 | Advanced | 61 |
| Inductive Reasoning | Very Important | 75 | Advanced | 61 |
| Information Ordering | Important | 66 | Advanced | 59 |
| Far Vision | Important | 63 | Advanced | 59 |
| Deductive Reasoning | Important | 69 | Advanced | 59 |
| Written Expression | Important | 60 | Advanced | 57 |
| Category Flexibility | Important | 60 | Advanced | 57 |
| Originality | Important | 63 | Advanced | 57 |
| Fluency of Ideas | Important | 60 | Advanced | 52 |
| Speech Recognition | Important | 63 | Advanced | 52 |
| Perceptual Speed | Important | 66 | Advanced | 50 |
| Speech Clarity | Important | 63 | Advanced | 50 |
| Arm-Hand Steadiness | Important | 50 | Advanced | 50 |
| Memorization | Important | 50 | Intermediate | 46 |
| Speed of Closure | Important | 50 | Intermediate | 46 |
| Visual Color Discrimination | Important | 53 | Intermediate | 45 |
| Finger Dexterity | Important | 53 | Intermediate | 45 |
| Selective Attention | Important | 63 | Intermediate | 45 |
| Manual Dexterity | Somewhat Important | 31 | Intermediate | 36 |
| Depth Perception | Somewhat Important | 47 | Intermediate | 36 |
| Time Sharing | Somewhat Important | 38 | Intermediate | 36 |
| Auditory Attention | Somewhat Important | 31 | Intermediate | 34 |
| Control Precision | Somewhat Important | 31 | Intermediate | 30 |
| Hearing Sensitivity | Somewhat Important | 28 | Intermediate | 25 |
| Spatial Orientation | Not Important | 22 | Intermediate | 25 |
| Wrist-Finger Speed | Not Important | 16 | Basic | 16 |
| Trunk Strength | Not Important | 19 | Basic | 14 |
| Gross Body Coordination | Not Important | 9 | Basic | 9 |
| Glare Sensitivity | Not Important | 6 | Basic | 9 |
| Speed of Limb Movement | Not Important | 9 | Basic | 7 |
| Stamina | Not Important | 6 | Basic | 5 |
| Extent Flexibility | Not Important | 6 | Basic | 5 |
| Static Strength | Not Important | 9 | Basic | 5 |
| Night Vision | Not Important | 3 | Basic | 4 |
| Multilimb Coordination | Not Important | 3 | Basic | 4 |
| Reaction Time | Not Important | 3 | Basic | 2 |
| Peripheral Vision | Not Important | 3 | Basic | 2 |
| Explosive Strength | Not Important | 3 | Basic | 2 |
| Response Orientation | Not Important | 3 | Basic | 2 |
| Gross Body Equilibrium | Not Important | 3 | Basic | 2 |
| Rate Control | Not Important | 3 | Basic | 2 |
| Sound Localization | Not Important | 0 | Basic | 0 |
| Dynamic Flexibility | Not Important | 0 | Basic | 0 |
| Dynamic Strength | Not Important | 0 | Basic | 0 |

Source: O*NET Database 11

**Occupational Skills Analysis
Construction and Building Inspectors (47-4011.00)**

Inspect structures using engineering skills to determine structural soundness and compliance with specifications, building codes, and other regulations. Inspections may be general in nature or may be limited to a specific area, such as electrical systems or plumbing.

Occupational Knowledge

| Knowledge | Importance | Imp (0-100) | Level | Lvl (0-100) |
|-------------------------------|--------------------|-------------|--------------|-------------|
| Building and Construction | Very Important | 87 | Advanced | 74 |
| Engineering and Technology | Very Important | 78 | Advanced | 65 |
| Design | Important | 61 | Advanced | 63 |
| Customer and Personal Service | Important | 65 | Advanced | 59 |
| Mathematics | Important | 58 | Advanced | 52 |
| Public Safety and Security | Important | 63 | Advanced | 51 |
| Computers and Electronics | Important | 50 | Advanced | 51 |
| Mechanical | Somewhat Important | 38 | Advanced | 50 |
| Administration and Management | Important | 57 | Intermediate | 49 |
| English Language | Important | 59 | Intermediate | 48 |
| Education and Training | Somewhat Important | 44 | Intermediate | 46 |
| Clerical | Somewhat Important | 44 | Intermediate | 42 |
| Geography | Somewhat Important | 29 | Intermediate | 35 |
| Psychology | Not Important | 19 | Intermediate | 30 |
| Communications and Media | Somewhat Important | 26 | Intermediate | 29 |
| Personnel and Human Resources | Somewhat Important | 28 | Intermediate | 28 |
| Physics | Not Important | 23 | Intermediate | 28 |
| Law and Government | Not Important | 20 | Intermediate | 25 |
| Transportation | Not Important | 23 | Basic | 24 |
| Production and Processing | Not Important | 22 | Basic | 23 |
| Chemistry | Not Important | 14 | Basic | 19 |
| Sales and Marketing | Not Important | 22 | Basic | 18 |
| Telecommunications | Somewhat Important | 28 | Basic | 17 |
| Economics and Accounting | Not Important | 20 | Basic | 13 |
| Biology | Not Important | 9 | Basic | 13 |
| Sociology and Anthropology | Not Important | 9 | Basic | 12 |
| History and Archeology | Not Important | 6 | Basic | 9 |
| Philosophy and Theology | Not Important | 3 | Basic | 6 |
| Fine Arts | Not Important | 7 | Basic | 6 |
| Therapy and Counseling | Not Important | 3 | Basic | 5 |
| Food Production | Not Important | 9 | Basic | 5 |
| Foreign Language | Not Important | 3 | Basic | 2 |
| Medicine and Dentistry | Not Important | 1 | Basic | 1 |

Source: O*NET Database 11

Occupational Skills

| Skill | Importance | Imp (0-100) | Level | Lvl (0-100) |
|-----------------------------------|--------------------|-------------|--------------|-------------|
| Reading Comprehension | Very Important | 91 | Advanced | 71 |
| Active Listening | Very Important | 80 | Advanced | 67 |
| Mathematics | Very Important | 76 | Advanced | 67 |
| Critical Thinking | Important | 70 | Advanced | 66 |
| Active Learning | Important | 69 | Advanced | 66 |
| Coordination | Important | 64 | Advanced | 64 |
| Time Management | Important | 68 | Advanced | 62 |
| Writing | Important | 64 | Advanced | 61 |
| Persuasion | Important | 53 | Advanced | 59 |
| Speaking | Important | 59 | Advanced | 58 |
| Instructing | Important | 56 | Advanced | 58 |
| Learning Strategies | Important | 56 | Advanced | 57 |
| Judgment and Decision Making | Important | 56 | Advanced | 56 |
| Social Perceptiveness | Important | 61 | Advanced | 56 |
| Monitoring | Important | 51 | Advanced | 55 |
| Equipment Selection | Somewhat Important | 46 | Advanced | 54 |
| Complex Problem Solving | Important | 60 | Advanced | 53 |
| Service Orientation | Somewhat Important | 48 | Advanced | 52 |
| Quality Control Analysis | Important | 60 | Intermediate | 49 |
| Negotiation | Somewhat Important | 47 | Intermediate | 48 |
| Troubleshooting | Important | 51 | Intermediate | 44 |
| Equipment Maintenance | Somewhat Important | 43 | Intermediate | 42 |
| Science | Somewhat Important | 48 | Intermediate | 42 |
| Operation Monitoring | Somewhat Important | 42 | Intermediate | 40 |
| Operations Analysis | Somewhat Important | 33 | Intermediate | 39 |
| Technology Design | Somewhat Important | 33 | Intermediate | 38 |
| Installation | Somewhat Important | 36 | Intermediate | 38 |
| Systems Analysis | Somewhat Important | 27 | Intermediate | 34 |
| Management of Material Resources | Somewhat Important | 28 | Intermediate | 31 |
| Operation and Control | Somewhat Important | 28 | Intermediate | 28 |
| Systems Evaluation | Not Important | 24 | Intermediate | 26 |
| Management of Personnel Resources | Not Important | 19 | Basic | 22 |
| Management of Financial Resources | Not Important | 17 | Basic | 20 |
| Repairing | Not Important | 16 | Basic | 19 |
| Programming | Not Important | 16 | Basic | 13 |

Source: O*NET Database 11

Occupational Abilities

| Ability | Importance | Imp (0-100) | Level | Lvl (0-100) |
|-----------------------------|--------------------|-------------|--------------|-------------|
| Problem Sensitivity | Very Important | 88 | Expert | 77 |
| Deductive Reasoning | Important | 72 | Advanced | 70 |
| Near Vision | Very Important | 75 | Advanced | 64 |
| Written Comprehension | Important | 69 | Advanced | 63 |
| Oral Expression | Very Important | 81 | Advanced | 61 |
| Information Ordering | Important | 63 | Advanced | 61 |
| Inductive Reasoning | Very Important | 75 | Advanced | 61 |
| Visualization | Important | 56 | Advanced | 59 |
| Auditory Attention | Somewhat Important | 44 | Advanced | 57 |
| Category Flexibility | Somewhat Important | 44 | Advanced | 57 |
| Oral Comprehension | Very Important | 75 | Advanced | 57 |
| Speed of Closure | Somewhat Important | 47 | Advanced | 57 |
| Flexibility of Closure | Important | 63 | Advanced | 55 |
| Perceptual Speed | Somewhat Important | 47 | Advanced | 54 |
| Extent Flexibility | Somewhat Important | 38 | Advanced | 52 |
| Written Expression | Important | 60 | Advanced | 50 |
| Speech Recognition | Important | 66 | Advanced | 50 |
| Selective Attention | Important | 53 | Advanced | 50 |
| Far Vision | Important | 53 | Intermediate | 48 |
| Visual Color Discrimination | Somewhat Important | 47 | Intermediate | 48 |
| Control Precision | Somewhat Important | 44 | Intermediate | 48 |
| Originality | Somewhat Important | 41 | Intermediate | 46 |
| Number Facility | Somewhat Important | 44 | Intermediate | 45 |
| Speech Clarity | Important | 72 | Intermediate | 45 |
| Gross Body Equilibrium | Somewhat Important | 31 | Intermediate | 45 |
| Mathematical Reasoning | Somewhat Important | 44 | Intermediate | 43 |
| Memorization | Somewhat Important | 38 | Intermediate | 43 |
| Depth Perception | Somewhat Important | 47 | Intermediate | 41 |
| Time Sharing | Somewhat Important | 44 | Intermediate | 41 |
| Trunk Strength | Somewhat Important | 38 | Intermediate | 38 |
| Spatial Orientation | Somewhat Important | 38 | Intermediate | 38 |
| Arm-Hand Steadiness | Important | 50 | Intermediate | 38 |
| Fluency of Ideas | Somewhat Important | 31 | Intermediate | 36 |
| Glare Sensitivity | Somewhat Important | 31 | Intermediate | 36 |
| Multilimb Coordination | Somewhat Important | 41 | Intermediate | 34 |
| Reaction Time | Somewhat Important | 31 | Intermediate | 32 |
| Finger Dexterity | Somewhat Important | 44 | Intermediate | 32 |
| Gross Body Coordination | Somewhat Important | 41 | Intermediate | 30 |
| Manual Dexterity | Somewhat Important | 35 | Intermediate | 29 |
| Response Orientation | Not Important | 22 | Intermediate | 27 |
| Hearing Sensitivity | Somewhat Important | 25 | Intermediate | 25 |
| Stamina | Somewhat Important | 28 | Intermediate | 25 |
| Sound Localization | Somewhat Important | 25 | Intermediate | 25 |
| Static Strength | Somewhat Important | 28 | Intermediate | 25 |
| Speed of Limb Movement | Not Important | 22 | Basic | 21 |
| Peripheral Vision | Somewhat Important | 28 | Basic | 21 |
| Rate Control | Somewhat Important | 25 | Basic | 20 |
| Night Vision | Not Important | 16 | Basic | 16 |
| Wrist-Finger Speed | Not Important | 16 | Basic | 14 |
| Dynamic Strength | Not Important | 13 | Basic | 14 |
| Dynamic Flexibility | Not Important | 3 | Basic | 5 |
| Explosive Strength | Not Important | 0 | Basic | 0 |

Source: O*NET Database 11

Program Assessment Plan

Architecture

Statement of Purpose

This program prepares students to work in architecture and related fields, or continue their education at the baccalaureate level. Students gain knowledge in design, drafting and construction methods, which qualifies them for entry-level positions in architectural and construction firms.

Catalog Description

The Architecture degree is an Associate in Applied Science and is designated as an extended degree program in that the student must complete a minimum of 73 or more credit hours. The Architecture program is designed to prepare students to work in architecture and related fields. The courses offered through this program will provide graduates with knowledge of construction methods and the ability to design small to medium scale residential and commercial projects. Upon completion, students will earn an Associate in Applied Science Extended Degree and could be employed in entry-level positions in the architectural and construction industries. Those pursuing further studies in architecture can utilize the Associate Degree toward transferring to a bachelor program in architecture at the university level. Students intending to pursue further studies in architecture should make direct contact with the university architecture programs for transfer guidance. For help in enrollment in the OCC architecture program, questions may be addressed to architectureprogram@oaklandcc.edu.

Program Assessment Plan

Architecture

Learning Outcomes

Students will have a basic understanding of the development and production of residential working drawings, and a basic understanding of residential construction practices.

| Benchmark | Assessment Method | Timeline |
|--|--|----------|
| 1. 85% of students will complete residential working drawing project and qualify to proceed further in the program by successfully completing ARC 1080 with a grade of "B-" or better. | 85% of students will receive a minimum grade of "B-" in each of the following four areas: Written examination, Drawing Development, Drawings evaluated on rubric (written criteria sheet), One on one drawing review and critique with the instructor. | 04/07 |
| 2. 85% of students will achieve "B-" or higher and meet industry standards for work developing residential construction drawings by completion of ARC 1080. | An average score of 85% on presentations to architects, classmates, and instructor, made 1-2 times during the course following the standard architectural critique process using a rubric. | 04/07 |
| 3. | | |
| 4. | | |
| 5. | | |

Program Assessment Plan

Architecture

Learning Outcomes

Students will utilize knowledge of codes, research, construction specifications, electrical, mechanical, and structural systems, to create Commercial design development drawings.

| Benchmark | Assessment Method | Timeline |
|---|---|----------|
| 1. 85% of students in ARC 2180 will achieve "B" or better on major project, assessed three times during semester using standard architectural critique processes. | A score of at least 80% on each critique of their major project utilizing a grading rubric. | 04/07 |
| 2. | | |
| 3. | | |
| 4. | | |
| 5. | | |

Program Assessment Plan

Architecture

Learning Outcomes

Students will develop oral and written technical communications skills.

| Benchmark | Assessment Method | Timeline |
|--|---|----------|
| 1. 85% of students in ARC 1040 will achieve "B-" or better in evaluation by faculty against architectural report writing standards, on two research projects, and their related presentations. | A score of at least 80% on the research reports and presentations based on a faculty grading rubric and industry standards. | 04/07 |
| 2. | | |
| 3. | | |
| 4. | | |
| 5. | | |

Program Findings Report

Architecture

1/1/2007 to 1/31/2008

Statement of Purpose

This program prepares students to work in architecture and related fields, or continue their education at the baccalaureate level. Students gain knowledge in design, drafting and construction methods, which qualifies them for entry-level positions in architectural and construction firms.

Catalog Description

The Architecture program is designed to prepare students to work in architecture and related fields. Through the courses in this program, the student will gain a knowledge of design, drafting and construction methods. Upon completion, the student will qualify for an Associate in Applied Science Extended Degree and could be employed at an entry-level position in architectural and construction firms. Students interested in transferring to a bachelor program in architecture should consult an Oakland Community College counselor prior to enrolling in classes.

Program Findings Report

Architecture

1/1/2007 to 1/31/2008

Learning Outcome ID 11

Students will have a basic understanding of the development and production of residential working drawings, and a basic understanding of residential construction practices.

Benchmark 1

85% of students will complete residential working drawing project and qualify to proceed further in the program by successfully completing ARC 1080 with a grade of "B-" or better.

Assessment Method 1

85% of students will receive a minimum grade of "B-" in each of the following four areas: Written examination, Drawing Development, Drawings evaluated on rubric (written criteria sheet), One on one drawing review and critique with the instructor.

Findings 1

Assessment not implemented.

Benchmark Met 1

Unknown

Dates

Assessed 04/06
Received 05/07

Learning Outcome ID 11

Students will have a basic understanding of the development and production of residential working drawings, and a basic understanding of residential construction practices.

Benchmark 2

85% of students will achieve "B-" or higher and meet industry standards for work developing residential construction drawings by completion of ARC 1080.

Assessment Method 2

An average score of 85% on presentations to architects, classmates, and instructor, made 1-2 times during the course following the standard architectural critique process using a

Findings 2

Assessment not implemented.

Benchmark Met 2

Unknown

Dates

Assessed 04/06
Received 05/07

Program Findings Report

Architecture

1/1/2007 to 1/31/2008

rubric.

Learning Outcome ID 12

Students will utilize knowledge of codes, research, construction specifications, electrical, mechanical, and structural systems, to create Commercial design development drawings.

Benchmark 1

85% of students in ARC 2180 will achieve "B" or better on major project, assessed three times during semester using standard architectural critique processes.

Assessment Method 1

A score of at least 80% on each critique of their major project utilizing a grading rubric.

Findings 1

Assessment not implemented.

Benchmark Met 1

Unknown

Dates

Assessed 04/06

Received 05/07

Program Findings Report

Architecture

1/1/2007 to 1/31/2008

Learning Outcome ID 13

Students will develop oral and written technical communications skills.

Benchmark 1

85% of students in ARC 1040 will achieve "B-" or better in evaluation by faculty against architectural report writing standards, on two research projects, and their related presentations.

Assessment Method 1

A score of at least 80% on the research reports and presentations based on a faculty grading rubric and industry standards.

Findings 1

Assessment not implemented.

Benchmark Met 1

Unknown

Dates

Assessed 04/06

Received 05/07



OAKLAND
COMMUNITY
COLLEGE

Curriculum Review Committee

Architecture Review

January 18, 2008

Faculty Coordinator: Syed Ahsan

- Since the Architecture Program has increased enrollment this past year, the faculty coordinator can request the Office of A&E to survey present students in order to see where the program is drawing students from for marketing purposes.
- CRC recommends the development of a brochure/website for marketing. Faculty Coordinator to work with Dave Adams.
- Since the Architecture program now articulates with LTU for a Bachelors Degree in Architecture, there is a strong need for an Architecture Studio/Lab. The faculty coordinator will work with the Interim Dean regarding shared resources until possible building A renovation. Consider laptop availability in the lab and for student use.
- Since Architecture has gone through major revisions, CRC is recommending a review update in 18 months to see if the programs changes have been effective.
- CRC recommends Architecture consider investigating an outside accreditation possibility (AIA).