Design Technology Degree and Certificate

The ARC Design Technology degree and certificate emphasizes the basic skills needed for success in architectural, mechanical, and engineering occupations. These include the design process, drafting standards and practices, technical communication, material sciences, and design critique. The use of computers and various computer aided design and drafting (CADD) softwares are emphasized throughout the program.

Requirements for Degree or Certificate 39 Units

- DESGN 100 Introduction to Computer Aided Drafting and Design (CADD) 3
- DESGN 102 Intermediate Computer Aided Drafting and Design (CADD) 3
- DESGN 300 Introduction to Design Resources 3
- DESGN 308 Three Dimensional Design-Solids Modeling 3
- DESGN 310 Graphic Analysis 3
- DESGN 320 Three Dimensional Graphics and Design 3
- DESGN 330 Machine Design 4
- DESGN 340 Architecture and Construction 5
- DESGN 350 Surveying and Construction Measurement Techniques 4
- ENGR 310 Industrial Materials Testing 3
- DESGN 360 Commercial Engineering Design and Drafting 5
- DESGN 405 Advanced Computer-Aided Drafting and Design (CADD) 3

Associate Degree Requirements: The Design Technology Associate in Arts (A.A.) Degree may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See ARC graduation requirements.

Engineering Technology Degree

The Engineering Technology degree gives students a basic preparation in physics, mathematics, computer aided design and drafting (CADD), chemistry, manufacturing processes, engineering materials and other subjects necessary for the well trained engineering technician.

Career Opportunities

Upon completion of the A.S. degree the engineering technician will be prepared to go directly into employment as a technical assistant to engineers, or other technical employment. The two-year A.S. degree program provides options for special concentration: engineering technology, architectural engineering technology, civil engineering technology, electrical engineering technology, or mechanical engineering technology. Engineering technicians are needed in the fields of manufacturing, architecture, construction, materials testing, public utilities and many other fields.

Requirements for Degree 41-44 Units

- CHEM 305 Introduction to Chemistry 5
- or CHEM 310 Chemical Calculations 4
- CISA 315 Introduction to Electronic Spreadsheets 2
- CISA 316 Intermediate Electronic Spreadsheets 2
- DESGN 100 Introduction to Computer Aided Drafting and Design (CADD) 3
- DESGN 102 Intermediate Computer Aided Drafting and Design (CADD) 3
- DESGN 300 Introduction to Design Resources 3
- or ENGR 307 Industrial Materials Testing 3
- CHEM 305 Chemical Calculations 4
- or CHEM 310 Chemical Calculations 4
- ENGR 307 Industrial Materials Testing 3
- DESGN 308 Three Dimensional Design-Solids Modeling 3

Associate Degree Requirements: The Engineering Technology Associate in Science (A.S.) Degree may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See ARC graduation requirements.

Engineering Technology Certificate

The Engineering Technology certificate gives students a basic preparation in physics, mathematics, computer aided drafting and design (CADD), chemistry, manufacturing processes, engineering materials and other subjects necessary for the well trained engineering technician.

Career Opportunities

Upon completion of the two-year certificate program the engineering technician will be prepared to go directly into the employment market as a technical assistant to engineers, or other technical employment. For every engineer, several support technicians are required. Engineering technicians are needed in the fields of manufacturing, architecture, construction, materials testing, public utilities and many other fields.

Requirements for Certificate 41-44 Units

- CHEM 305 Introduction to Chemistry 5
- or CHEM 310 Chemical Calculations 4
- CISA 315 Introduction to Electronic Spreadsheets 2
- CISA 316 Intermediate Electronic Spreadsheets 2
- DESGN 100 Introduction to Computer Aided Drafting and Design (CADD) 3
- DESGN 102 Intermediate Computer Aided Drafting and Design (CADD) 3
- DESGN 300 Introduction to Design Resources 3
- or ENGR 307 Industrial Materials Testing 3
- DESGN 308 Three Dimensional Design-Solids Modeling 3
DESIGN 310 Graphic Analysis (3) .............................................. 3
or ENGR 312 Engineering Graphics (3)
DESIGN 330 Machine Design (4) .............................................. 3 - 4
or ENGR 320 Manufacturing Processes (3)
DESIGN 340 Architecture and Construction (5) ......................... 5
or DESIGN 360 Commercial Engineering Design and Drafting (5)
DESIGN 350 Surveying and Construction Measurement Techniques (4)  . 4
or ENGR 310 Engineering Survey Measurements (4)
MATH 330 Trigonometry ..................................................... 3 - 4
PHYS 310 Conceptual Physics (3) ............................................. 3 - 4
or PHYS 350 General Physics (4)

**Engineering: Transfer Degree**

The purpose of the program is to provide academic preparation for transfer to California State University, Sacramento for the Engineering Construction Management Program or the Mechanical Engineering Technology Program. At the completion of the courses in the option, a student will obtain an A.S. Degree and have many of the courses required for transfer. Please check the current Articulation Agreement by Major at [www.asisst.org](http://www.asisst.org).

**Construction Management Option** 70-71.5 Units

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>ACCT 301</td>
<td>Financial Accounting</td>
<td>4</td>
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<tr>
<td>ACCT 311</td>
<td>Managerial Accounting</td>
<td>4</td>
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<tr>
<td>BIOL 303</td>
<td>Survey of Biology</td>
<td>4</td>
</tr>
<tr>
<td>BUS 340</td>
<td>Business Law</td>
<td>3</td>
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<tr>
<td>CISA 305</td>
<td>Beginning Word Processing</td>
<td>2</td>
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<tr>
<td>CISA 315</td>
<td>Introduction to Electronic Spreadsheets</td>
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<tr>
<td>CISC 320</td>
<td>Operating Systems</td>
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<tr>
<td>DESIGN 100</td>
<td>Introduction to Computer Aided Drafting and Design (CADD)</td>
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<tr>
<td>DESIGN 102</td>
<td>Intermediate Computer Aided Drafting and Design (CADD)</td>
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<tr>
<td>DESIGN 310</td>
<td>Graphic Analysis</td>
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<tr>
<td>DESIGN 340</td>
<td>Architecture and Construction (5)</td>
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<tr>
<td>or DESIGN 360</td>
<td>Commercial Engineering Design and Drafting (5)</td>
<td>5</td>
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<tr>
<td>DESIGN 350</td>
<td>Surveying and Construction Measurement Techniques (4)</td>
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</tr>
<tr>
<td>or ENGR 310</td>
<td>Engineering Survey Measurements (4)</td>
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<tr>
<td>ENGR 307</td>
<td>Industrial Materials Testing (3)</td>
<td>3 - 4.5</td>
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<tr>
<td>ENGR 413</td>
<td>Properties of Materials (4.5)</td>
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</table>

**Mechanical Engineering Technology Option** 70-74 Units

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>CHEM 305</td>
<td>Introduction to Chemistry (5)</td>
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<tr>
<td>CHEM 400</td>
<td>General Chemistry (5)</td>
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<tr>
<td>or CISA 315</td>
<td>Introduction to Electronic Spreadsheets</td>
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<tr>
<td>and CISA 316</td>
<td>Intermediate Electronic Spreadsheets (2)</td>
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<tr>
<td>DESIGN 100</td>
<td>Introduction to Computer Aided Drafting and Design (CADD)</td>
<td>3</td>
</tr>
<tr>
<td>DESIGN 102</td>
<td>Intermediate Computer Aided Drafting and Design (CADD)</td>
<td>3</td>
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<tr>
<td>DESIGN 300</td>
<td>Introduction to Design Resources (3)</td>
<td>3</td>
</tr>
<tr>
<td>or ENGR 307</td>
<td>Industrial Materials Testing (3)</td>
<td>3</td>
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<tr>
<td>DESIGN 308</td>
<td>Three Dimensional Design-Solids Modeling</td>
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<tr>
<td>DESIGN 310</td>
<td>Graphic Analysis (3)</td>
<td>3</td>
</tr>
<tr>
<td>or ENGR 312</td>
<td>Engineering Graphics (3)</td>
<td>3</td>
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<tr>
<td>DESIGN 330</td>
<td>Machine Design</td>
<td>4</td>
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</tbody>
</table>

**Design & Engineering Technology**

- **DESIGN 340** Architecture and Construction (5) .............................................. 5
- **DESIGN 360** Commercial Engineering Design and Drafting (5)
- **DESIGN 350** Surveying and Construction Measurement Techniques (4) . 4
- **ENGR 310** Engineering Survey Measurements (4)
- **ENGR 320** Manufacturing Processes .............................................. 3
- **MATH 350** Calculus for the Life and Social Sciences I .................... 3
- **MATH 351** Calculus for the Life and Social Sciences II ................... 3
- **PHYS 350** General Physics ........................................................... 4
- **PHYS 360** General Physics ........................................................... 4
- **STAT 301** Introduction to Probability and Statistics ...................... 3

A minimum of 3 units from the following: .............................................. 3

CSU course: Construction Management 22 (May be taken prior to transferring, consult with a counselor)

**Associate Degree Requirements**

- The Engineering: Transfer Associate in Science (A.S.) Degree may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See ARC graduation requirements.

- **DESIGN 100** Introduction to Computer Aided Drafting and Design (CADD) 3 Units

  **Hours:** 36 hours LEC, 72 hours LAB

  This course is an introduction to computer-assisted drafting and design (CADD) and basic technical drawing. It covers orthographic and isometric projection concepts, utilizing CADD to produce basic technical drawings and applies the editing commands available in the software. It introduces basic drawings from architecture, mechanical design, electronics and space planning. This course may be taken four times using different software releases.

- **DESIGN 102** Intermediate Computer Aided Drafting and Design (CADD) 3 Units

  **Prerequisite:** DESIGN 100 with a grade of “C” or better.

  **Hours:** 36 hours LEC, 72 hours LAB

  This course emphasizes advanced CADD commands and design graphics drawing principles. Orthographic and isometric projection principles are used for solving missing view problems with CADD as the tool for producing the drawings. Section views for mechanical and architectural applications are covered. Topics encompass architectural design, mechanical design, 3D-drawing, orthographic and isometric projection, sections, developments, attributes, civil drafting, and interior design and space planning. This course covers the preparation for professional work skills and advanced design courses. This course may be taken four times using different software releases.

- **DESIGN 298** Work Experience in Design Technology 1-4 Units

  **Hours:** 72 hours LEC

- **DESIGN 300** Introduction to Design Resources 3 Units

  **Advisory:** ENGR 102 or 103, and ENGRD 116 with a grade of “C” or better; OR ESLR 320 and ESLW 320 with a grade of “C” or better; OR placement through assessment process.

  **Course Transferable to CSU**

  **Hours:** 54 hours LEC

  This course is a survey of the resources that are used in the architectural and engineering professions for design planning, evaluation, and selection. It covers the methods and techniques used to determine human resources, evaluate and select materials for design, and disseminate design information.
DESIGN 308 Three Dimensional Design-Solids Modeling 3 Units
Prerequisite: DESGN 300, DESGN 100, and DESGN 320 with a grade of "C" or better.
Corequisite: DESGN 102.
Advisory: ENGWR 102 or 103, and ENGRD 116 or ESLR 320 and ESLW 320.
Course Transferable to CSU
Hours: 36 hours LEC; 72 hours LAB
This course will cover the concepts and applications of three dimensional graphic design using AutoCAD solid modeling, mechanical desktop, and solid works software. Topics include the development and techniques for producing wire frame, surface, and solid models and their application in architectural and mechanical design. This course may be taken 4 times on different software releases.

DESIGN 310 Graphic Analysis 3 Units
Prerequisite: DESGN 100 with a grade of "C" or better.
Advisory: Design Technology 102.
Course Transferable to CSU
Hours: 36 hours LEC; 72 hours LAB
This course covers CADD applications of the orthographic projection and geometric construction principles to solve technical problems as well as graphical analysis of the true length, true shape, true angle in the solution of engineering and architectural problems. This course satisfies the transfer requirements to CSU for engineering, engineering technology, and design technology students.

DESIGN 320 Three Dimensional Graphics and Design 3 Units
Advisory: ENGWR 102 or 103, ENGRD 116 or ESLR 320 and ESLW 320 or placement through assessment process.
Course Transferable to CSU
Hours: 36 hours LEC; 72 hours LAB
This course includes instruction and practice in freehand engineering and architectural technical expression in various graphic media. Additionally, students will develop design solutions represented in freehand perspectives and 3-D CADD solutions.

DESIGN 330 Machine Design 4 Units
Prerequisite: DESGN 310.
Advisory: DESGN 100.
Course Transferable to CSU
Hours: 54 hours LEC; 54 hours LAB
This course covers instruction in machine design and dimensioning of engineering machine drawings. Basic dimensioning of orthographic, sections, auxiliaries, forging, and casting drawings will be studied as well as basic manufacturing techniques. Emphasis will be placed on the latest ANSI Standard for Geometric Dimensioning and Tolerancing and its application to working drawings. Satisfies the transfer requirement for machine drawing to CSUS Mechanical Engineering Technology Program.

DESIGN 340 Architecture and Construction 5 Units
Prerequisite: DESGN 102, 310, and 320.
Course Transferable to CSU
Hours: 54 hours LEC; 108 hours LAB
This course covers individual and group exercises simulating typical design, drafting and procedures in architecture and construction. The course focuses on residential design and light commercial wood frame construction.