

# Drafting Technology and Engineering

School of Mathematics, Computer Science and Engineering

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## Curriculum

Students majoring in drafting technology prepare to enter several areas of the technology, including mechanical, electrical, and aeronautical/aerospace technology, and their various research and development fields. The curriculum emphasizes the universal language used in industrial, technical, and engineering applications. Students develop the skills needed to produce and interpret technical drawings, using traditional as well as multi-axis computer-based graphics generation. Laboratory experiences include working on many different types of drafting problems designed to refine the students' abilities to interpret, analyze and transmit facts graphically. Supplementary core course requirements stress the development of basic skills in mathematics, communication, and the sciences.

## Major

The program is designed to prepare students for employment within the broad spectrum of the drafting and design field. Various options are available to meet both short- and long-range educational goals. Students may select the technically specific certificate program or the broad-based Associate in Science degree in Drafting Technology or the Computer-Aided Drafting Design (CAD) emphasis. By completing the associate degree, the student ensures a high level of competency within the technology as well as developing a strong, broad-based foundation in preparation for future upgrade. Individual and sequenced courses are designed for those who are currently employed and wish to upgrade or specialize in a specific subject area.

## Certificate in Drafting Technology

Students must complete all courses in the certificate program with a grade of "C" or better. A minimum of 12 units in the certificate program must be completed at Irvine Valley College. See page 60 for further information.

## Associate in Science Degree in Drafting Technology

Students must complete a minimum of 60 units of credit, including the courses in the major and general education requirements (page 57), with an overall GPA of 2.0 or better. A minimum of 12 units must be completed at Irvine Valley College. See pages 54–55 for further information, including other options for fulfilling the major requirement.

## Transfer Preparation

Courses that fulfill major requirements for an associate degree at Irvine Valley College may not be the same as those required for completing the major at a transfer institution offering a baccalaureate degree. Students who plan to transfer to a four-year college or university should (1) refer to the transfer section of this catalog, (2) consult the catalog of their prospective transfer institution (see the IVC Transfer Center for assistance), and (3) schedule an appointment with an IVC counselor to develop a plan of study before beginning their program. It may be helpful to meet with the department faculty at IVC.

## Associate in Science Degree Major or Certificate in Drafting Technology

Compete the following courses:		Units
<b>DR 100</b>	Fundamentals of Mechanical Drafting	3
<b>DR 101</b>	Mechanical Drafting	3
<b>DR 150</b>	Introduction to Computer-Aided Drafting	3
<b>ENGR 21</b>	Introduction to Engineering and Technology	1
<b>ENGR 23</b>	Engineering Graphics and Descriptive Geometry	3
<b>ENGR 183</b>	Computer-Aided Design Techniques	3
<b>MATH 124</b>	Trigonometry	3
<b>MATH 253</b>	Intermediate Algebra	5

**TOTAL UNITS: 24**

## COMPUTER-AIDED DESIGN EMPHASIS (MECHANICAL OPTION)

Compete the following courses:		Units
<b>CIM 100A</b>	Computer Keyboarding and Document Processing I	1.5
<b>DR 100</b>	Fundamentals of Mechanical Drafting	3
<b>DR 101</b>	Mechanical Drafting	3
<b>DR 102</b>	Mechanical Drafting and Design	3
<b>DR 150</b>	Introduction to Computer-Aided Drafting	3
<b>ENGR 21</b>	Introduction to Engineering and Technology	1
<b>ENGR 23</b>	Engineering Graphics and Descriptive Geometry	3
<b>ENGR 183</b>	Computer-Aided Design Techniques	3
<b>ENGR 184</b>	Advanced Computer-Aided Design	3
<b>ENGT 140</b>	Manufacturing Processes	3
<b>MATH 124</b>	Trigonometry	3

**TOTAL UNITS: 29.5**

**Recommended Electives:** DR 160, ET 101, PHYS 2A, SP 1, WR 1

## Courses

### Drafting

**DR 100: Fundamentals of Mechanical Drafting** 3 Units

2 hours lecture, 4 hours lab

Corequisite: CIS 205L.

This course develops basic drafting skills, including the proper use of drafting instruments, lettering, geometric construction, multiview projection, selections and conventions, pictorial drawings, single auxiliary views, and dimensioning. NR

**DR 101: Mechanical Drafting** 3 Units

2 hours lecture, 4 hours lab

Prerequisite: Dr. 100. Corequisite: CIS 205L.

This course develops the basic skills required to produce industrial quality assembly and detail drawings, including first and second auxiliary views, shop practices, and tolerancing. Students further develop their fundamental mechanical drawing skills. NR

**DR 102: Mechanical Drafting And Design** 3 Units

2 hours lecture, 4 hours lab

Prerequisite: Dr. 101. Corequisite: CIS 205L.

In this course students develop the basic skills needed for industrial-level mechanical drawing and conceptual design, including assembly drawings and detail drawings. They study the fundamentals of mechanical design and strategies for creative design. NR

**DR 150: Introduction to Computer-Aided Drafting** 3 Units

2 hours lecture, 4 hours lab

Corequisite: CIS 205L.

This is an introductory course teaching the operation and application of a computer-aided drafting (CAD) system that is used to create, modify, store, and plot mechanical, architectural, and electronic drawings. Approved for UC credit. R-E-3

**DR 160: Intro to CAD for Electronic Schematic Entry Applications** 3 Units

1.5 hours lecture, 4.5 hours lab

Corequisite: CIS 205L.

This course reviews the history of printed circuit card technology over the last twenty years. Several designs will be taken through layout, block diagrams, schematics, schematic capture, autorouting of single- and multiple-layer printed circuit cards, and computer-aided manufacturing report generation. Each design will be applied to various technologies, from the past to the present, showing how technologies dictate methods. NR

### Engineering (General)

**ENGR 21: Introduction to Engineering and Technology** 1 Unit

1 hour lecture

This course is a survey of the fields of engineering and related occupations. It is designed to familiarize students with the educational requirements and opportunities for employment as a scientist, engineer, or technician, as well as the nature and responsibilities of such work. NR

**ENGR 23: Engineering Graphics and Descriptive Geometry** 3 Units

1.5 hours lecture, 4.5 hours lab

Corequisite: CIS 205L.

In this course students will learn the principles of graphical expression through sketching, orthographic projection, auxiliary views, dimensions, and working drawings. They will learn and practice the descriptive geometry methods of points, lines, planes, warped surfaces, intersections and developments. NR

**ENGR 183: Computer-Aided Design Techniques** 3 Units

1.5 hours lecture, 4.5 hours lab

Corequisite: CIS 205L.

This is an advanced course providing instruction in the latest techniques available in computer-aided design. The course focuses on the use of the computer as a tool in all phases of the design process. Students will work with computer-aided design systems, using computer graphics to solve a variety of design problems. NR

**ENGR 184: Advanced Computer-Aided Design** 3 Units

1.5 hours lecture, 4.5 hours lab

Corequisite: CIS 205L.

This advanced course uses a high-function CAD/CAM system which offers design and manufacturing engineers a tool for 2-D and 3-D graphic applications. The course is intended to explore higher functions of CAD/CAM modeling systems using advanced curves and surfaces. NR

### Engineering Technology

**ENGT 130: Industrial Automation** 3 Units

3 hours lecture

Corequisite: CIS 205L.

This course combines automation techniques and philosophies used throughout industry into a comprehensive computer-integrated environment. Major topics include machine control, robotics, programmable controllers, and material handling. The course also introduces system integration and related components structured for an industrial environment. NR

**ENGT 140: Manufacturing Processes-Systems Introduction** 3 Units

3 hours lecture

This is an introductory course in manufacturing technology concepts, functions, and techniques. The course provides exposure to manufacturing activities, computer-aided design (CAD), computer-aided manufacturing (CAM), manufacturing systems and plant layout, materials handling, process control cost and value, quality control, production control, and the solution of manufacturing technology problems. NR