Drafting/CAD

The 21st century is witnessing a rapid growth in science, engineering and technology. This will require society to read, write and draw the language of technology—*drafting*.

Drafting is used in a wide variety of business, industrial, professional and governmental activities, including the following:

Anthropology	Industrial Technology
Archeology	Interior Design
Architecture	Landscape Architecture
Art—Design	Landscape Horticulture
Automotive Services	Machine Shop/Welding
Computer Drafting	Mapping
Computer Science	Marine Diving Technology
Electronics	Mathematics—Applied
Engineering	Mechanical/Elect. Systems
Environmental Studies	Physics—Applied
Geology/Geography	Surveying
Graphics—Design	Technical Illustration

Santa Barbara City College's Drafting/CAD Department offers comprehensive training for entry-level positions. California certificated and professionally experienced instructors teach all departmental courses, with heavy emphasis on the laboratory use of modern drafting equipment.

Full college credit is granted for each course successfully completed. Students who complete the 31.0 units of required Drafting/CAD courses and the controlled electives earn a Certificate of Achievement in Drafting/CAD. Those who also complete institutional and General Education course requirements earn the Associate in Science Degree in Drafting/CAD. The department offers all courses with an open-door policy—both for majors and non-majors.

Program Student Learning Outcomes

1. Ability to prepare and understand technical drawings.
2. Ability to use computer software to generate technical drawings.
3. Obtain occupational knowledge and skills related to drafting.
4. Understand methods, materials and technical skills related to design and construction.

Faculty and Offices

Armando M. Arias del Cid, *Chair* (OE-24, ext. 2436)
Joseph Connell (OE-24, ext. 2388)
Laura Welby (OE-16A, ext. 2522)
Dean: Betty Pazich (A-218, ext. 3044)

Certificates and Degrees Awarded

Associate in Science Degree, Drafting/CAD

Certificate of Achievement, Drafting/CAD

Certificate of Achievement Requirements: Drafting/CAD

(See Sample Program)

Department Requirements (31 units)

DRFT 101 — Basic Drafting 3

DRFT 130/ENGR 130 — Computer-Assisted Draft and Design I.....5

DRFT 131/ENGR 131 — Computer-Assisted Draft and Design II.....5

Plus 15 units of Drafting electives selected from the following:

DRFT 105-299.....15

Plus 3 units of controlled electives selected from the following:

*DRFT 105-299; CNEE 150; ENGR 115, 117/117L

Note: Up to 16 of the 18 units of electives required may be DRFT 290 Work Experience in Drafting.

A.S. Degree Requirements: Drafting/CAD

An Associate in Science Degree in Drafting/CAD can be obtained by satisfying the Certificate of Achievement in Drafting/CAD requirements and the General Education and institutional requirements for the Associate in Science Degree. See "Graduation Requirements" in the *Catalog* Index.

Planning a Program of Study

Students are advised to see a college counselor and the Department Chairperson in planning a program of study. Many factors need to be considered in the plan, including:

1. Academic goals, i.e., bachelor's degree, associate degree, or certificate programs.

2. Career and occupational goals, i.e., professional, paraprofessional, technical, occupational, or trade.
3. Program majors, such as Architecture, Engineering, Computer Science, Graphic Design, Electronic/ Computer Technology and others.
4. The Drafting/CAD Department advises the student to make the choice between pursuing Architectural Drafting or Mechanical Drafting early in his/her education.

Note: Students who have completed the Certificate of Completion requirements can continue on to the Associate in Science Degree by satisfying General Education and SBCC requirements for the A.S. Degree.

Honors and Awards

The Drafting/CAD Department selects one student each year as "Outstanding Student." Selections are made by the department faculty and are based on academic achievement and service to the college.

Tutorial Opportunities

Each semester, the Drafting/CAD Department is allocated funds to hire student tutors. Students who have performed well in a course and who demonstrate interest in teaching are selected by the department to tutor students currently enrolled in courses. The purpose of this program is two-fold. Students currently taking courses receive excellent peer tutoring and tutors learn the techniques of teaching. Tutors also find that to teach is to learn.

Special Department Resources

A wide range of resources is available to all students enrolled in the Drafting/CAD Program. Students have access to exceptionally well-equipped laboratories with modern drafting furniture, computers, machines and supplies. Blueprinting facilities are available. Light tables and special mapping tables are available in the Drafting laboratory. A CAD (Computer-Assisted Drafting) laboratory is the department's latest modern facility addition.

The department sponsors several events, programs and services to help the student become better acquainted with the professional world of drafting. These include seminars, guest lectures, films, internships and work experience liaison with area employers.

Advising

In addition to the college counselor for the Drafting/ CAD Department and the Career Center, the Department Chairperson advises students who are planning academic, professional or occupational programs and investigating career goals. For further information, contact Armando M. Arias del Cid, OE-24, 965-0581, ext. 2436.

Course Descriptions

DRFT 101 — Basic Drafting
(3) F, S — CSU, UC
Skills Advisories: MATH 1 and eligibility for ENG 103

Fundamental concepts of technical drawing. Topics include lettering, use of instruments, mathematics for drafting, multiviews, dimensioning, assemblies, sections, pictorials, perspectives, graphs and charts.

DRFT 102/ CT 118 — Measuring and Calculating
(3) F, S — CSU
Skills Advisories: MATH 1

Introduction to measuring and calculating used in residential wood construction. Topics include working with common and decimal fractions, using the standard tape measure, using a calculator for construction, estimating material, understanding the special triangles used in roof rafter calculations, rafter length calculation, and stair stringer calculation.

DRFT 103/ CT 116 — Blueprint Reading
(3) F, S — CSU
Course Advisories: Eligibility for ENG 100

Introduction to blueprint reading in residential construction. Topics include understanding the uses of blueprints, types of plans, drafting conventions, contents of plans, focus on floor plans, elevations and sections, using the architectural scale, drafting simple plans, and shop drawings from plans.

DRFT 105/ENGR 105 — Engineering Graphics
(4) F, S — CSU, UC
Skills Advisories: MATH 1 and eligibility for ENG 100 and ENG 103

Graphic/visual communication, emphasizing the engineering design process. Topics include the design process, freehand sketching, multiviews, dimensioning, tolerancing, auxiliary views, sectional views and computer-aided-drafting.

DRFT 120 — Architectural Drafting I
(3) F, S — CSU
Skills Advisories: MATH 1 and eligibility for ENG 103

Practices and procedures used in architectural drafting. Work includes line work, lettering and use of instruments in drafting a set of simple residential working drawings.

DRFT 121 — Architectural Drafting II
(3) F, S — CSU
Prerequisites: DRFT 120
Skills Advisories: MATH 1 and eligibility for ENG 103

Practices and procedures used in architectural drafting and design. Work includes designing a small residence and drafting a set of simple residential working drawings.

DRFT 124 — Architectural Rendering I
(3) F, S — CSU
Prerequisites: DRFT 101 or DRFT 105/ENGR 105 or DRFT 110 or DRFT 120 or DRFT 126
Skills Advisories: MATH 1 and eligibility for ENG 103

Fundamentals of architectural rendering, including presentation drawing of interior and exterior one- and two-point perspectives, oblique and isometric drawings. Rendering techniques include surfaces and textures, shades and shadows, figures and foliage. Emphasis on compiling a portfolio of architectural presentation drawings.

DRFT 125 — Architectural Rendering II
(3) F, S — CSU
Prerequisites: DRFT 124
Skills Advisories: MATH 1 and eligibility for ENG 103

Advanced techniques of architectural rendering, including presentation drawings of one- and two-point perspectives, oblique and isometric drawings. Rendering techniques include surfaces and textures, shades and shadow, figures and foliage. Emphasis on compiling a portfolio of architectural presentation drawings.

DRFT 126/EH 126 — Landscape Drafting I
(3) F, S — CSU
Skills Advisories: MATH 1 and eligibility for ENG 103

Principles of drafting and plan reading required for the landscape architecture and ornamental horticulture fields. Work includes investigating styles and designing and drafting plans, elevations and details.

DRFT 127/EH 127 — Landscape Drafting II
(3) F, S — CSU
Prerequisites: DRFT 126 or EH 126
Skills Advisories: MATH 1 and eligibility for ENG 103

Advanced principles of drafting and plan reading required for the landscape architecture and ornamental horticulture fields. Work includes site plans, elevations and details.

DRFT 129 — Principles of Residential Construction
(3) F, S — CSU
Skills Advisories: MATH 1 and eligibility for ENG 103

Overview of residential construction for homeowners, remodelers, drafters and designers. Topics include building codes, materials, grading, foundations, framing, mechanical systems, doors and windows, roofing and drywalling.

DRFT 130/ENGR 130 — Computer-Assisted Drafting and Design I
(5) F, S — CSU, UC*
Prerequisites: DRFT 101 or DRFT 105 / ENGR 105 or DRFT 110 or DRFT 120 or DRFT 126
Skills Advisories: MATH 1 and eligibility for ENG 103

Introduction to AutoCAD, including overview of equipment, operating systems and CAD applications in various engineering, drafting and design environments. Designed for people who have no AutoCAD experience and who may not have any previous microcomputer or CAD experience. Foundational in the coverage and usages of the many AutoCAD features. *(*UC transfer limit: DRFT 130/ENGR 130, DRFT 131/ENGR 131 and DRFT 132/ENGR 132 combined: maximum credit, one course).*

DRFT 131/ENGR 131 — Computer-Assisted Drafting and Design II
(5) F, S — CSU, UC*
Prerequisites: DRFT 130/ENGR 130
Skills Advisories: MATH 1 and eligibility for ENG 103

Designed to provide experienced 2D AutoCAD users with an understanding of creating 3D models, shading and rendering techniques in AutoCAD and AutoVision, and customizing features of AutoCAD. *(*UC transfer limit: DRFT 130/ENGR 130, DRFT 131/ENGR 131 and DRFT 132/ENGR 132 combined: maximum credit, one course).*

DRFT 132/ENGR 132 — Computer-Assisted Drafting and Design III
(5) S — CSU, UC*
Prerequisites: DRFT 130/ ENGR 130
Skills Advisories: MATH 1 and eligibility for ENG 103

Introduction to building information modeling. Designed to meet the needs of students who want to learn the basics of industry-standard building information modeling software. *(*UC transfer limit: DRFT 130/ ENGR 130, DRFT 131/ENGR 131 and DRFT 132/ ENGR 132 combined: maximum credit, one course).*

DRFT 136/MAT 136 — Computer Animation I
(3) F, S — CSU
Skills Advisories: MATH 1 and eligibility for ENG 103
Course Advisories: ART 124A and ART 140 and ART 141 and DRFT 131/ENGR 131

Fundamentals of computer animation, including modeling, animation and rendering. Focus on computer animation tools and techniques. Builds a solid foundation for developing character animation and special-effect sequences.

DRFT 137/MAT 137 — Visual Effects for Film, Television and Gaming
(3) F, S — CSU
Skills Advisories: Eligibility for ENG 100 and ENG 103

Course on visual effects using 3-D and Compositing software to complete the scene production. Utilizing particles, rigid-bodies and soft bodies, students apply techniques for creating natural phenomena, such as waterfalls and blowing leaves. Also explored are methods for simulating physical interactions, such as a chair falling down a staircase.

DRFT 138/MAT 138 — 3-D Character Animation
(3) F, S — CSU
Skills Advisories: Eligibility for ENG 100 and ENG 103

Advanced 3-D computer animation course on character animation, including character design, modeling techniques for bodies, heads, hands and feet, skeletal and muscle systems, facial animation and lip-syncing to dialogue..

DRFT 139/MAT 139 — 3-D Lighting and Rendering
(3) F, S — CSU
Skills Advisories: Eligibility for ENG 100 and ENG 103
Two hours lecture, three hours lab, plus two additional hours weekly.

Advanced 3-D computer animation course on the art and science of lighting and rendering. Techniques for creating photo-realistic computer-generated imagery explored, including lighting, shadowing, texture mapping and shader manipulation.

DRFT 290 — Work Experience in Drafting
(1- 4) F, S — CSU

Limitation on Enrollment: (1) Employed or available for employment in an occupation directly related to the Drafting major; and (2) Must be enrolled in no less than seven (7) units, including Work Experience.

May be taken for 1, 2, 3 or 4 units of credit. One unit is earned for each (5) hours of work weekly. One additional unit may be earned for the one lecture hour weekly. Maximum of four (4) units per semester for a maximum of sixteen (16) units.

Work experience on a job or project directly related to drafting, combined with classroom instruction enabling the student to acquire skills and attitudes necessary to enter and/or progress in a drafting occupation.

DRFT 299 — Independent Study in Drafting
(1-4) F, S — CSU

Limitation on Enrollment: Completion of a minimum of 12 units at SBCC, with a 2.5 G.P.A., and a minimum of 6 units, with a 3.0 G.P.A. within the department.

For complete information, see “Independent Study” in the *Catalog* Index.