

students with disabilities. Practice in understanding and performing basic arithmetic tasks necessary for successful functioning in society.

DR 25 Algebra Support (1.5,3)
1½ or 3 hours lecture

Recommended preparation: MATH 15 or eligibility for MATH 50

Note: Pass/No Pass grading only; may be taken 4 times

Non-degree Applicable

Provides personalized instruction in basic study management techniques for the support of students with disabilities in mainstream classes. The course will help students with disabilities to develop specialized study techniques and interpersonal skills needed for success in mainstream classes.

DR 26 Composition Skills and Strategies for the Intermediate Writer (3)

3 hours lecture

Recommended preparation: ENG 10 or eligibility for ENG 50

Note: May be taken 2 times

Non-degree Applicable

This class is designed to help students with disabilities improve their intermediate composition skills through methods and strategies specific to their disabilities.

DR 40 Adapted Computer Skills (3)
3 hours lecture

Note: May be taken 3 times

Non-degree Applicable

Provides computer training using specialized software and hardware adaptations to assist students with disabilities to develop skills in word processing and Internet research.

DR 41 Advanced Adapted Computers for Students with Disabilities (3)

3 hours lecture

Recommended preparation: DR 20

Note: May be taken 3 times

Non-degree Applicable

Provides training in more advanced software for students with disabilities by using their prescribed access technology. Course work meets computer literacy competence for CSUSM.

DR 42 Voice Recognition for Students with Disabilities (2)
2 hours lecture

Note: May be taken 2 times

Non-degree Applicable

Provides voice recognition computer training for students with disabilities.

DR 43.1 Software for Students with Vision Loss I (3)
3 hours lecture

Recommended Preparation: Keyboarding skills with a minimum of 15 words per minute

Note: May be taken 2 times

Non-degree Applicable

Provides training using specialized software and hardware adaptations to assist students with blindness/low vision to develop computer skills.

DR 43.2 Software for Students with Vision Loss II (3)
3 hours lecture

Recommended Preparation: Keyboarding skills with a minimum of 15 words per minute along with prior experience with a screen reading or magnification application

Note: May be taken 2 times

Non-degree Applicable

Provides training using specialized software and hardware adaptations in combination with Microsoft Office, Internet Explorer, and other academic applications.

DR 45L Adapted Computer Laboratory (1)
3 hours laboratory

Note: Pass/No Pass grading only; may be taken 4 times

Non-degree Applicable

Provides supervised hands on opportunities to acquire and reinforce skills on computer equipment adapted for students with disabilities.

DR 47 Topics in Disability Resource (.5-3)

Units awarded in topics courses are dependent upon the number of hours required of the student. Any combination of lecture and/or laboratory may be scheduled by the department. Refer to Class Schedule.

Note: May be taken 3 times

Non-degree Applicable

Topics in disability resource. See Class Schedule for specific topic offered. Course title will designate subject covered.

Drafting Technology (DT)

Contact the Design and Consumer Education Department for further information.

(760) 744-1150, ext. 2349

Office: P-8A

Associate in Arts Degrees -

AA Degree requirements are listed in Section 6 (green pages).

- Computer Assisted Drafting
- Drafting Technology - Multimedia
- Drafting Technology - Technical
- Electro-Mechanical Drafting and Design
- Interactive Media Design - Emphasis in 3D Modeling and Animation
- Interactive Media Design - Emphasis in Multimedia Design

Certificates of Achievement -

Certificate of Achievement requirements are listed in Section 6 (green pages).

- Computer Assisted Drafting
- Drafting Technology - Multimedia
- Drafting Technology - Technical
- Electro-Mechanical Drafting and Design
- Interactive Media Design - Emphasis in 3D Modeling and Animation
- Interactive Media Design - Emphasis in Multimedia Design

PROGRAMS OF STUDY

Computer Assisted Drafting

Prepares students in the skills necessary for employment as a computer assisted drafting operator.

A.A. DEGREE MAJOR OR CERTIFICATE OF ACHIEVEMENT

Program Requirements		Units
DT/ARCH 125	AutoCAD Introduction to Computer Aided Drafting	3
DT 126	AutoCAD Intermediate Computer Aided Drafting	3
DT 127	AutoCAD Customization	2
DT 128	SolidWorks Introduction to 3D Design and Presentation	3
DT 131	SolidWorks Advanced 3D Design and Presentation	3
IT/WELD 108	Technical Mathematics	3
	or	
MATH 50	Beginning Algebra	4
	or	
MATH 50A	Beginning Algebra Part I	2
	and	
MATH 50B	Beginning Algebra Part II	2
	or	
MATH 56	Beginning/Intermediate Algebra	6
	or	
MATH 60	Intermediate Algebra	4
Electives (Select 12 units)		
ARCH 200	Advanced Computer Aided Architectural Drafting	4
CE 100	Cooperative Education	1 - 4
DT 110	Technical Drafting I with AutoCAD	4
DT 111	Technical Drafting II with AutoCAD	4
DT 116	Geometric Dimensioning and Tolerancing	2
DT 196B	Special Problems in Computer Aided Drafting	1 - 3
DT/ARCH 202	Introduction to Revit Architecture	3

DT 210	Printed Circuit Board Design	3
DT 211	Advanced Printed Circuit Board Design	3
MATH 110	College Algebra	4
	or	
MATH 115	Trigonometry	3
TOTAL UNITS		29 - 32

Drafting Technology - Multimedia

Prepares students in the skills necessary for employment in the multimedia presentation field.

A.A. DEGREE MAJOR OR CERTIFICATE OF ACHIEVEMENT

Program Requirements		Units
DT/ARCH 125	AutoCAD Introduction to Computer Aided Drafting	3
DT 126	AutoCAD Intermediate Computer Aided Drafting	3
DT 128	SolidWorks Introduction to 3D Design and Presentation	3
DT 180	3D Studio Max - Introduction to 3D Modeling and Animation	3
DT 182	3D Studio Max-Advanced 3D Modeling and Animation	3
DT 184	Real Time 3D Technical/Game Animation	2
IT/WELD 108	Technical Mathematics	3
	or	
MATH 50A	Beginning Algebra Part I and	2
MATH 50B	Beginning Algebra Part II	2
	or	
MATH 50	Beginning Algebra	4

Electives (Select 12 units)

ARTD 150	Digital Concepts and Techniques in Art	3
ARTD 220	Motion Design	3
ARTI 246	Digital 3D Design and Modeling	3
ARTI 247	Digital 3D Design and Animation	3
COMM 100	Mass Media in America	3
CSIT 120	Computer Applications	3
DT 131	SolidWorks Advanced 3D Design and Presentation	3
DT 196B	Special Problems in Computer Aided Drafting	3
DT/ARCH 202	Introduction to Revit Architecture	3
GCIP 140	Digital Imaging/Photoshop I	4
GCMW 101	Multimedia I	4
GCMW 201	Multimedia II	4
MATH 110	College Algebra	4
	or	
MATH 115	Trigonometry	3
MUS 180	Computer Music I	3
CE 100	Cooperative Education	I - 4

TOTAL UNITS 33 - 36

Drafting Technology - Technical

Prepares students in the skills necessary for employment as a drafter in machine, mechanical, electrical, aeronautical, civil, and other related engineering fields.

A.A. DEGREE MAJOR OR CERTIFICATE OF ACHIEVEMENT

Program Requirements		Units
DT 110	Technical Drafting I with AutoCAD	4
DT 111	Technical Drafting II with AutoCAD	4
DT/WELD 117	Geometric Dimensioning and Tolerancing	2.5
DT/ARCH 125	AutoCAD Introduction to Computer Aided Drafting	3
DT 126	AutoCAD Intermediate Computer Aided Drafting	3
DT 128	SolidWorks Introduction to 3D Design and Presentation	3
DT/WELD 130	CAD/CAM Machining	3
DT 131	SolidWorks Advanced 3D Design and Presentation	3
IT/WELD 108	Technical Mathematics	3
	or	

MATH 50A	Beginning Algebra Part I and	2
MATH 50B	Beginning Algebra Part II	2
	or	
MATH 50	Beginning Algebra	4
	or	
MATH 60	Intermediate Algebra	4

Electives (Select 6 units)

CE 100	Cooperative Education	I - 4
CSIT 120	Computer Applications	3
DT 100	Basic Mechanical Drawing	3
DT 127	AutoCAD Customization	2
DT 180	3D Studio Max - Introduction to 3D Modeling and Animation	3
DT 182	3D Studio Max-Advanced 3D Modeling and Animation	3
DT 184	Real Time 3D Technical/Game Animation	2
DT 196A	Special Problems in Drafting	I - 3
	or	
DT 196B	Special Problems in Computer Aided Drafting	I - 3
DT/ARCH 202	Introduction to Revit Architecture	3
MATH 110	College Algebra	4
	or	
MATH 115	Trigonometry	3

TOTAL UNITS 34.5 - 35.5

Electro-Mechanical Drafting and Design

Drafts detailed working drawings of electro mechanical equipment and devices. Indicates dimensions, materials, and manufacturing procedures for electronic industry.

A.A. DEGREE MAJOR OR CERTIFICATE OF ACHIEVEMENT

Program Requirements		Units
DT 110	Technical Drafting I with AutoCAD	4
DT 111	Technical Drafting II with AutoCAD	4
DT/ARCH 125	AutoCAD Introduction to Computer Aided Drafting	3
DT 127	AutoCAD Customization	2
DT 128	SolidWorks Introduction to 3D Design and Presentation	3
DT 210	Printed Circuit Board Design	3
DT 211	Advanced Printed Circuit Board Design	3
IT/WELD 108	Technical Mathematics	3
	or	
MATH 50A	Beginning Algebra Part I and	2
MATH 50B	Beginning Algebra Part II	2
	or	
MATH 50	Beginning Algebra	4
	or	
MATH 60	Intermediate Algebra	4

Electives (Select 6 units)

CE 100	Cooperative Education	I - 4
CSIT 120	Computer Applications	3
DT 126	AutoCAD Intermediate Computer Aided Drafting	3
DT/WELD 130	CAD/CAM Machining	3
DT 131	SolidWorks Advanced 3D Design and Presentation	3
DT 196B	Special Problems in Computer Aided Drafting	I - 3
MATH 110	College Algebra	4

TOTAL UNITS 31 - 32

Interactive Media Design

Prepares students with specific skills necessary for employment in the field of multimedia design and production. Students may choose an emphasis in either 3D modeling and animation, which emphasizes production skills and authoring systems, or multimedia design, which emphasizes content development and visual

design of multimedia productions. Both areas of emphasis collaborate on an actual multimedia production.

Emphasis in 3D Modeling and Animation

A.A. DEGREE MAJOR OR CERTIFICATE OF ACHIEVEMENT

Program Requirements	Units
ARTI 100 Introduction to Illustration	3
ARTI 246 Digital 3D Design and Modeling	3
ARTI 247 Digital 3D Design and Animation	3
DT 180 3D Studio Max – Intro to 3D Modeling/Animation	3
DT 182 3D Studio Max – Adv 3D Modeling/Animation	3
GCIPI 140 Digital Imaging/Photoshop I	4
GCMW 204 Motion Graphics for Multimedia	4
Electives (Select two courses)	
ARTD 150 Digital Concepts/Techniques in Art	3
ARTD 220 Motion Design	3
DT 128 SolidWorks Intro 3D Design and Presentation	3
DT 184 Real Time 3D Technical/Game Animation	2
GCIPI 240 Digital Imaging/Photoshop III	4
GCMW 100 History of Multimedia	3
GCMW 201 Multimedia II	4
ENTT/RTV 120 Digital Television Production	3
TOTAL UNITS	28 – 31

Emphasis in Multimedia Design

A.A. DEGREE MAJOR OR CERTIFICATE OF ACHIEVEMENT

Program Requirements	Units
ARTD 100 Graphic Design I	3
ARTD 220 Motion Design	3
ARTI 247 Digital 3D Design and Animation	3
GC 110 Graphics and Media: A Multicultural Perspective	3
GCIPI 240 Digital Imaging/Photoshop III	4
GCMW 101 Multimedia I	4
GCMW 201 Multimedia II	4
GCMW 204 Motion Graphics/Multimedia	4
Electives (Select two courses)	
ART 197G Topics in Art – Computer Art	3
ARTD 150 Digital Concepts and Techniques in Art	3
ARTI 246 Digital 3D Design/Modeling	3
DT 180 3D Studio Max–Intro to 3D Modeling/Animation	3
DT 182 3D Studio Max–Adv 3D Modeling/Animation	3
GC 100 Graphic Communications	3
GCIPI 140 Digital Imaging/Photoshop I	4
GCIPI 152 Digital Publishing/Illustrator I	4
GCMW 100 History of Multimedia	3
GCMW 102 Web Page Layout I	4
GCMW 197B Topics in Multimedia	3
GCMW 203 Web Multimedia	4
MUS 180 Computer Music I	3
RTV 170 Introduction to Video Editing	3
TOTAL UNITS	34 - 36

Interactive Media Design A.A. Degree or Certificate of Achievement is also listed in Art and in Graphic Communications.

COURSE OFFERINGS

DT 100 Basic Mechanical Drawing	(3)
2 hours lecture - 3 hours laboratory	
Transfer acceptability: CSU	

Fundamentals of mechanical drawing including theory, lettering, sketching, geometric constructions, orthographic projection, sectioning, developments, dimensioning, and pictorial and working drawings.

DT 110 Technical Drafting I with AutoCAD	(4)
2 hours lecture - 6 hours laboratory	

Prerequisite: A minimum grade of 'C' in DT/ARCH 125, or concurrent enrollment in DT/ARCH 125

Transfer acceptability: CSU

Fundamentals of drafting including lettering, sketching, instruments, geometric constructions, orthographic projections, dimensioning, tolerancing, sectional views and auxiliary views. Drafting will be performed on the computer using AutoCAD software.

DT 111 Technical Drafting II with AutoCAD	(4)
2 hours lecture - 6 hours laboratory	

Prerequisite: A minimum grade of 'C' in DT 110 and DT 125/ARCH 125

Note: May be taken 2 times

Transfer acceptability: CSU

Advanced drafting practices using customized AutoCAD software. Basic studies will include pictorial drafting, descriptive geometry, and revolutions. Working/shop drawings in topography, developments, cabinet/millwork, structural steel, and welding will be performed. Emphasis is placed on increased productivity by customizing AutoCAD to the student's requirements.

DT 117 Geometric Dimensioning and Tolerancing	(2.5)
2 hours lecture - 2 hours laboratory	

Note: Cross listed as WELD 117; may be taken 2 times

Transfer acceptability: CSU

An introduction to geometric dimensioning and tolerancing ASME Y14.5-2009. Students will learn to identify, use appropriate geometric symbols and techniques of geometric dimension, and produce industrial quality drawings. Students will also learn to measure and verify geometric dimensions and tolerances of manufactured items.

DT 125 AutoCAD Introduction to Computer Aided Drafting	(3)
1½ hours lecture - 4½ hours laboratory	

Note: Cross listed as ARCH 125. May be taken 2 times; maximum of 4 completions in any combination of DT/ARCH 125, DT 126 and DT 127.

Transfer acceptability: CSU; UC – DT/ARCH 125 and 126 combined: maximum credit, one course

An introduction to computer aided drafting using AutoCAD software and IBM compatible computers. Hands on experience with AutoCAD to include the following operations: preparing and editing drawings, storage and retrieval of drawings, and production of commercial quality drawings on a plotter. Introductory computer terminology and techniques in Windows.

DT 126 AutoCAD Intermediate Computer Aided Drafting	(3)
1½ hours lecture - 4½ hours laboratory	

Prerequisite: A minimum grade of 'C' in DT/ARCH 125

Note: May be taken 2 times; maximum of 4 completions in any combination of DT/ARCH 125, DT 126 and DT 127.

Transfer acceptability: CSU; UC – DT 125 and 126 combined: maximum credit, one course

Advanced theory and hands on operation of a CAD system. Emphasis is placed on large scale drawings, three dimensional software techniques, orthographic projections, and complex computer aided manufacturing applications.

DT 127 AutoCAD Customization	(2)
1 hour lecture - 3 hours laboratory	

Prerequisite: A minimum grade of 'C' in DT/ARCH 125

Note: May be taken 2 times; maximum of 4 completions in any combination of DT/ARCH 125, DT 126 and DT 127.

Transfer acceptability: CSU

Advanced theory and hands on operation of a CAD system. Emphasis is placed on increased productivity using customization and portfolio presentation for successful career opportunities.

DT 128 SolidWorks Introduction to 3D Design and Presentation (3)*1 ½ hours lecture - 4 ½ hours laboratory***Prerequisite:** A minimum grade of 'C' in DT/ARCH 125**Recommended preparation:** DT 110**Note:** May be taken 2 times.**Transfer acceptability:** CSU

Advanced theory and hands on operation of three-dimensional software techniques. Emphasis is placed on wireframe, surface, solid, and parametric three-dimensional modeling.

DT 130 CAD/CAM Machining (3)*1 ½ hours lecture - 4 ½ hours laboratory***Prerequisite:** A minimum grade of 'C' in DT 110 and DT 128**Transfer acceptability:** CSU**Note:** Cross listed as as WELD 130. May be taken 2 times

Hands-on operation of importing three-dimensional solid and parametric three-dimensional models into CAD/CAM operations.

DT 131 SolidWorks Advanced 3D Design and Presentation (3)*1 ½ hours lecture - 4 ½ hours laboratory***Prerequisite:** A minimum grade of 'C' in DT 128**Note:** May be taken 2 times**Transfer acceptability:** CSU

Advanced theory and hands-on operation of solid and parametric three-dimensional models. Emphasis is placed on creating molds, advanced sheet metal design and developing dynamic assemblies.

DT 140 Electronic Drafting and Design (3)*1 ½ hours lecture - 4 ½ hours laboratory***Note:** May be taken 2 times**Transfer acceptability:** CSU

Electro mechanical drafting and design generally required for an entry level position in the electronic industry.

DT 180 3D Studio Max – Introduction to 3D Modeling and Animation (3)*1 ½ hours lecture - 4 ½ hours laboratory***Note:** May be taken 2 times**Transfer acceptability:** CSU

An overview of 3D Studio Max. Hands-on operation of the software to produce basic three-dimensional models and basic technical animations.

DT 182 3D Studio Max – Advanced 3D Modeling and Animation (3)*1 ½ hours lecture - 4 ½ hours laboratory***Prerequisite:** A minimum grade of 'C' in DT 180**Note:** May be taken 2 times**Transfer acceptability:** CSU

Advanced 3D Studio Max applications to create special visual effects for high-end image production. Advanced keyframing, time-based editing, controllers, and video post will be employed to master state-of-the-art rendering and animation. The class is structured to help students start using 3D Studio Max in a production environment.

DT 184 Real Time 3D Technical/Game Animation (2)*1 hour lecture - 3 hours laboratory***Note:** May be taken 2 times**Transfer acceptability:** CSU

Students will create interactive 3D applications using a direct X base real time engine for the game industry, computer based training and product visualization.

DT 196 Special Problems in Computer Aided Drafting (1, 2, 3)*3, 6, or 9 hours laboratory***Note:** May be taken 4 times for a maximum of 9 units**Transfer acceptability:** CSU

This is an advanced course designed to aid the student in the enrichment of an area of concentration in AutoCAD and third party drafting software and is of a research nature. Content to be determined by the need of the student under signed contract with the instructor.

DT 197 Drafting Technology Topics (.5 - 4)

Units awarded in topics courses are dependent upon the number of hours required of the student. Any combination of lecture and/or laboratory may be scheduled by the department. Refer to Class Schedule.

Note: May be taken 4 times**Transfer acceptability:** CSU

Topics in Drafting. See class schedule for specific topic covered. Course title will designate subject covered.

DT 202 Introduction to Revit Architecture (3)*1 ½ hours lecture - 4 ½ hours laboratory***Recommended preparation:** ARCH 200**Note:** Cross listed as as ARCH 202. May be taken 2 times**Transfer acceptability:** CSU

Preparation of basic 3D architectural information models and (BIM). Manipulation for preparation of individual architectural working drawings, including: dimensioned floor plans, building sections, elevations, etc. using Revit software.

DT 210 Printed Circuit Board Design (3)*1 ½ hours lecture - 4 ½ hours laboratory***Prerequisite:** A minimum grade of 'C' in DT 110**Note:** May be taken 2 times**Transfer acceptability:** CSU

Instruction in printed circuit board design generally required for entry level positions in the electronic industry. Includes artwork and complete documentation for analog and digital multi-layer; flexible and high-speed boards using current IPC standards. Drafting will be performed on the computer using high-end printed circuit board software.

DT 211 Advanced Printed Circuit Board Design (3)*1 ½ hours lecture - 4 ½ hours laboratory***Prerequisite:** A minimum grade of 'C' in DT 210**Note:** May be taken 2 times**Transfer acceptability:** CSU

Advanced problems and instruction in printed circuit board design generally required for entry-level position in the electronic industry. Special emphasis will be placed on advanced applications including surface mount technology. Includes artwork and complete documentation for analog and digital multi-layer, flexible and high-speed boards using current IPC standards. Drafting will be performed on the computer using AutoCAD and PADS software.

Earth Sciences (ES)

Contact the Earth, Space, and Aviation Sciences Department for further information.

(760) 744-1150, ext. 2512

Office: NS-110G

COURSE OFFERINGS

ES 100 The Earth as a System: Case Studies of Change in Space and Time (3)*3 hours lecture***Transfer acceptability:** CSU; UC

An overview of the fields of geology, geography, oceanography, and astronomy that approach Earth as a system. Areas of study include those related to plate tectonics, earthquakes, volcanoes, geologic time, landscape evolution, weather systems, ocean circulation, climate change, and exploration of the solar system.

ES 115 Natural Disasters and Environmental Hazards (3)*3 hours lecture***Note:** Cross listed as GEOG 115**Transfer acceptability:** CSU; UC

Examination and analysis of natural disasters and environmental hazards including earthquakes, tsunamis, volcanic activity, hurricanes, flooding, air and water pollution, and global climate change.

ES 195 Regional Field Studies in Earth Science (1, 2, 3)*2, 4 or 6 hours lecture/laboratory***Note:** May be taken 4 times**Transfer acceptability:** CSU