DACUM Research Chart for CADD Professional

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Duties	Tasks				
A **Create Design Concept**	A-1 Define product function	A-2 Participate in product brainstorming meetings	A-3 Define product limitations (e.g., general size, cost, material, quantity)		A-4 Define product operating environment
B **Design a Product**	B-1 Determine final product size	B-2 Determine final product shape	B-3 Determine final product material/components (e.g., HVAC, plumbing, circuit board)		B-4 Determine final product cost/estimate
C **Develop a Product**	C-1 Obtain approval of drawings (e.g., to engineering, management, customer, regulatory agencies)		C-2 Build a product prototype* (FDM, SLA)	C-3 Participate in design modification meetings	C-4 Incorporate modifications/ revisions into design
D **Coordinate Product Manufacture/ Construction**	D-1 Obtain approval of final product design from vendors/shops	D-2 Participate in product manufacture/ construction meetings	D-3 Revise drawings to meet manufacturers'/construction requirements		D-4 Obtain approval of revised drawings
E **Provide Product Support**	E-1 Respond to manufacturing/construction problems/concerns (e.g., phone, e-mail, fax, meetings)		E-2 Respond to requests for minor product modifications (e.g., phone, e-mail, fax, meetings)		E-3 Review request(s) for product modifications
F **Manage Professional Career**	F-1 Pursue professional licensure	F-2 Attend professional seminars	F-3 Attend continuing education classes on CADD software		F-4 Train CADD professionals

Product is defined in this analysis as an object or structure that has form, value, and function (e.g., objects ranging from components as small as watch gears to large structures such as highways and buildings).

***** The asterisked tasks represent the engineering aspect of the CADD Professional job. The remaining tasks represent both engineering and architectural aspects.

**The CADD Professionals who participated in this job analysis work in different locations and organizations. Although the duties and tasks are performed by one or more of these professionals, no one performs all of the duties and tasks represented by this analysis.

A-5 Define product shape	A-6 Sketch preliminary product concept	A-7 Review concept design with management	A-8 Select design concept			
B-5 Determine final product quantity	B-6 Incorporate regulatory agencies' requirements into product design (see list of agencies)	B-7 Refine product design	B-8 Identify manufacturing process (e.g., machine requirements, injection molding, erection, & assembly processes)		B-9 Participate in design meetings	B-10 Draw the product
C-5 Re-draw the product	C-6 Identify potential vendors/ subcontractors	C-7 Build final product prototype* (e.g., FDM, SLA)	C-8 Test product prototype*	C-9 Adjust drawings based on test results*	C-10 Obtain approval for final product design (e.g., from engineering, management, customer, regulatory agencies)	
D-5 Design jigs/fixtures/ molds for product*	D-6 Inspect first piece parts for design compliance & quality control*					
E-4 Modify product per request	E-5 Maintain electronic and paper files	E-6 Maintain regulatory agency files				
F-5 Read current publications for regulatory agencies	F-6 Read professional publications	F-7 Participate in professional organizations	F-8 Pursue higher education			

Acronyms of Regulatory Agencies

(This is not a comprehensive list. Refer to *Drawing Requirements Manual for Industry and Departments of Defense*)

FAA	Federal Aviation Administration
OSHA	Occupational Safety and Health Administration
NTSB	National Transportation Safety Board
AISC	American Institute of Steel Construction
FCC	Federal Communications Commission
SAE	Society of Automotive Engineers
ANSI	American National Standards Institute
AISI	American Iron and Steel Institute
ASTM	American Society for Testing and Materials
ASME	American Society of Mechanical Engineers
ISO	International Standards Organization
IEEE	Institute of Electrical and Electronic Engineers
AITC	American Institute of Timber Construction
ASHRAE	American Society of Heating, Refrigeration, and Air Conditioning Engineers
UL	Underwriters Laboratories
CE	Regulatory arm of the European Union
MILSPEC	Military Specifications

Other Acronyms

CADD	Computer Aided Drafting and Design
ECO	Engineering Change Order
IT	Information Technology
SLA	Stereo Lithography
FDM	Fused Deposition Model
GIS	Geodedic Information System
GDT	Geometric Dimensioning & Tolerancing
HVAC	Heating, Ventilation, Air Conditioning

General Knowledge and Skills

Communication skills: oral, written, listening, presentation
Computer skills: Office Suite, i.e. Microsoft Office, CADD Software, GIS software, peripheral devices such as plotters, printers
Multi-tasking skills
Mathematics/Statistics: College Algebra, Trigonometry, Analytic Geometry, Basic Calculus
Analytic/problem-solving skills
Blueprint reading
Knowledge of regulatory agencies
Metrology inspection method knowledge
Geometric dimensioning tolerance
General construction knowledge
Basic knowledge of construction & manufacturing materials
Basic design principles
Interpersonal skills
Teaching and training skills
Visualization/graphic skills
Cultural awareness
Foreign language skills

Worker Behaviors

Able to work under pressure
Detail oriented
Dependable
Team player
Honesty
Appropriate dress
Creative
Common sense
Self-motivated
Goal oriented
Dedicated
Flexible
Independent worker
Positive attitude
Time management
Think outside the box
Social skills

Tools, Equipment, Supplies and Materials

Reference materials (e.g. standards, material handbooks, regulations)
Computer, Internet access
Software (e.g. drafting packages, Microsoft Works, etc.)
Digital camera
Measuring equipment
General office supplies
Test and evaluation equipment (e.g. scopes, meters, hardness tests)
SLA machine
Computer peripheral devices
Telephone, fax machine
Basic machine and shop tools
Photocopier
Data acquisition equipment

Future Trends and Concerns

More offshore outsourcing
Cost of changing technology
More specialized software
Changing standards
Multiple formats for education and training
Environmental responsibilities/planned recyclability
More work with less people
Need for more technical background
Economic ramifications
Litigious society