APPENDIX A

Supporting Information

Academic Program Review Schedules
Academic Program Review Cost sheet

Academic Program Review
Evaluation Plan
CAD Drafting Tool Design Technology

Degree Awarded: A.A.S. CAD Drafting Tool Design Technology

Program Review Panel:

Co-Chairs: Todd Rose and Dan Wanink
Program Faculty: Mark Hill
Individual with special interest in the Program: Robert Speirs –Chair –Plastics & Rubber Department, Don Snow – Operations Manager - Cedar Springs Tool Engineering
Faculty outside the College of Technology: Professor Terry Doyle
Department Chair: Thomas Hollen

Purpose: To conduct a study of the CAD Drafting Tool Design Technology Program and its needs, effectiveness and mission so the University can make informed decisions about the resources and resource allocations.

Data Collection Techniques:

Comparative analysis of current and past years data:

1. 2008 Graduate surveys and most recent APR survey data
2. 2008 Employer surveys and most recent APR survey data
3. 2008 Student evaluation of program and courses and most recent APR data.
4. 2008 Faculty perceptions of the program by CAD Drafting Tool Design faculty and College of Technology faculty.
5. 2008 Advisory Committee perceptions of the program from the survey and most recent APR survey results.
6. Labor Market analysis information from current market indicators.
7. Evaluation of facilities and equipment as review by faculty and industry requirements and needs.
8. Curriculum evaluation information will be taken from industry requirements and standards. Data from employer and advisory surveys will be included.

Schedule of Events:

Activity	**Leader**	**Target Date**
Graduate survey	Hill	March 1, 2008
Employer survey	Rose	March 1, 2008
Student Survey	Wanink	March 1, 2008
Faculty Perceptions of Program	Speirs	March 1, 2008
Advisory Committee Perceptions	Wanink	March 1, 2008
Labor Market Analysis	Rose	March 1, 2008
Evaluation of Facilities	Hill	March 1, 2008
Curriculum Evaluation	Wanink,	April 1, 2008

CAD Drafting Tool Design Technology
Academic Program Review
Proposed Budget

Alumni/Student Surveys:

Copying costs:	$85.00
Mailing costs:	$200.00
Return Envelope costs:	$30.00
Return Mailing costs:	$70.00

Employer follow-up survey:

Copying costs:	$85.00
Mailing costs:	$200.00
Return Envelope costs:	$30.00
Return Mailing costs:	$50.00

Advisory Committee Surveys:

Copying Mailing and Return Mailing Costs: $50.00

Student wage support:

40 Hours @ $7.25 $290

Phone Expenses: $75.00

Final Document Coping Costs: $200.00

Total: $1365

APPENDIX B

Supporting Information

Faculty Resumes
Program Course Syllabus
Faculty Schedules

FERRIS STATE UNIVERSITY
COLLEGE OF TECHNOLOGY
Mechanical Design Department

COURSE SYLLABUS

Instructor: Todd Rose

COURSE TITLE: CDTD 211 Die Design

COURSE DESCRIPTION: This course is a theory-practice/lab course which meets four hours per day - three days per week for fifteen weeks. It is configured for approximately three hours per week of lecture and nine hours of lab or actual design time. The course will give the student the knowledge and ability to design various types of stamping dies. Operations such as blanking, forming, cam, piercing, drawing and trimming will be included in the design of single operation and progressive dies. Varieties of standard and special components will be incorporated in the assignments. The course will emphasize proper drawing techniques and documentation.

Press accessories and feeding mechanisms are studied as they relate to the design problems; safety standards will be studied and applied to all assignments. Solid Modeling CAD system will be utilized for the assignments.

Upon completion of this course, the student will have the ability to go directly into industry involved in the design of stamping dies.

CREDIT HOURS: Six Semester Hours

CONTACT HOURS: Lecture - 3 Hours/Week
Lab - 9 Hours/Week

PREREQUISITES: CDTD 121 and CDTD 122 or equivalent

TEXTBOOK REQUIRED: Die Design Fundamentals, Paquin/Bolvanovic
Course Pack #9274 Metal Stamping Die Design

UNITS OF INSTRUCTION AND STUDENT LEARNING GOALS FOR EACH UNIT:
The student will:

I. Introductions
- A. Introductions and class structure
- B. Grading scale
- C. Attendance policy
- D. Equipment and supplies required

II. Introduction to Blank Dies
- A. What is a die?
- B. What is stamping?
- C. Die components
  1. Purchased-standard
  2. Special

D. Presses
   1. Types of presses
   2. How presses operate – components
E. Steps in designing dies
F. Selecting die sets

III. Compound/Combination Dies
A. Advantages and disadvantages of compound dies
B. Punches - types and construction
C. Punch and die clearance
D. Calculate blanking forces
E. Calculate stripping forces
F. Spring selection
G. Knockouts and strippers
H. Shoulder screws (stripper bolts)
I. Nesting/Gaging

IV. Progressive Dies
A. How progressive dies work
B. Strip layout and utilization
C. Blank development
D. Notches
E. Punches and pilots
F. Die sections-segmenting steels vs. EDM
G. Spools - retainers
H. Forming - bend allowance
I. Misfeed detectors
J. Sensors
K. Shedders and lifters
L. Stops
M. Compare progressive dies and transfer dies
N. Lifters

V. Draw Dies
A. Blank development
B. Types of draw dies and concept
C. Draw forces
D. Ring holding pressure
E. Types or pressures
F. Steel selection for die components
G. Types of draw steels
H. Lubricants

VI. CAM Dies
A. How cam dies work
B. Types of cams
C. Purchased vs. "homemade" components
D. Strippers and pressure pads
E. Loading and unloading mechanisms

COURSE GOALS:

1. Design dies incorporating standard and non-standard components

2. Use catalogs and CAD web sites to select standard components

3. Know die terms, die clearance and theory

4. Apply proper springs, punches, pilots and die sets

5. Apply die clearances to punch and die components

6. Select steels, die block construction, machining practices and heat treatment as best determined by the type of die and amount of production

7. Apply proper safety precautions dependent upon the type of operation

8. Design for quality yet economy

9. Design from a part print in contrast to copying an existing design

10. Use various reference books and materials available for die design

11. Know the OSHA safety standards and die protection

12. Apply the variety of operations in stamping dies, such as: blanking, piercing, notching, trimming, cams, forming, drawing, etc.

13. Understand presses and related equipment used in stamping dies

ASSIGNMENTS:

1. Progressive die blueprint layout

2. Compound blank and pierce die

3. Progressive die to include strip layout, notching, trim, pierce, pilot, blanking, stripper, stops and die set selection

4. Progressive die to include cam, forming, spools, ball bearing die set

5. Draw die

NOTE:

Above assignments may be combined into more complicated progressive dies.

Tests, quizzes, work sheets and a field trip will be included

. FERRIS STATE UNIVERSITY
COLLEGE OF TECHNOLOGY
Technical Drafting/Tool Design

COURSE: _____

INSTRUCTOR: _____

COURSE CONFIGURATION: Lecture _____ Lab _____

START TIME	END TIME	DAY OF WEEK
Lec Lab _____ am pm	_____ am pm	M T W T F
Lec Lab _____ am pm	_____ am pm	M T W T F
Lec Lab _____ am pm	_____ am pm	M T W T F
Lec Lab _____ am pm	_____ am pm	M T W T F
Lec Lab _____ am pm	_____ am pm	M T W T F

OFFICE HOURS: _____

GRADING SCALE:

A	95-100	C	78-82
A-	93-94	C-	76-77
B+	91-92	D+	74-75
B	87-90	D	70-73
B-	85-86	D-	68-69
C+	83-84	F	67-0

Grades will be based on:
_____% for lab Projects
_____% for Tests
_____% for Quizzes/Worksheets
Attendance included in lab projects

MAKE-UP WORK POLICY:

- Quizzes missed cannot be made up
- Exam cannot be made up unless unusual circumstances prevail. Up to ten points will be deducted from any make-up exam score
- Project deadlines not met will be penalized

ATTENDANCE POLICY:
All students are required to arrive on time and remain for the duration of the class period. Any student with a valid reason for an excused absence must see the instructor (prior to the absence if possible). Attendance will reflect in their grade; thus, it behooves the student to discuss any absence with the instructor.

FERRIS STATE UNIVERSITY
COLLEGE OF TECHNOLOGY
Mechanical Design Department

COURSE SYLLABUS

COURSE TITLE: CDTD 221 Mold Design

COURSE DESCRIPTION: The student will design various types of Single and Multiple Cavity Plastic Injection Molds including A/B, Lifter, and Slide Action and Master Unit Molds. Products will be analyzed and detailed with respect to injection molding utilizing CAD. The student will be given instruction on the theory, application and practices of: plastic materials and products, various plastic forming and molding methods, types of plastic injection molding machines, types and styles of standard and special mold bases, size and styles of runners, gates, and sprues (including heated runners), mold venting, cooling system theory and practices, ejector systems, mold materials. Heat treatments, mold fabrication, and finishing practices are applied to all mold designs in this class.

CREDIT HOURS: Six Semester Hours

CONTACT HOURS: Lecture - 3 Hours/Week
Lab - 9 Hours/Week

PREREQUISITES: CDTD 121

TEXTBOOK REQUIRED: None

UNITS OF INSTRUCTION AND STUDENT LEARNING GOALS FOR EACH UNIT:
The student will:

I. Introduction to Course and Plastics Industry
   A. Know the course goals, attendance and grading policies
   B. Introduction to plastics industry
   C. Know various plastics forming and fabrication methods and practices

II. Plastic Products and Materials
   A. Describe plastic compounds and materials
   B. Identify appearance and structural flaws in plastic products
   C. Identify industrial tolerances for plastics
   D. Design and/or detail plastic products

III. Molding Methods
   A. Describe the injection molding process
   B. Describe the compression molding process

C. Describe the transfer molding process
D. Describe the die cast molding process

IV. Injection Molding Machines
A. Identify the major machine components
B. Describe the term shot and cycle
C. Describe the various barrel feed mechanisms
D. Identify the minimum mold height, maximum daylight and distance between tie bars for a given machine

V. Injection Mold Bases
A. Identify and apply standard and non-standard components
B. Use standard component catalogs
C. Know application and limits of an inserted injection mold (MUD) unit
D. Design a multiple cavity standard injection mold
E. Know and apply standard components of a multiple cavity cold runner injection mold
F. Describe the use of special and modified injection mold bases

VI. Cores and Core Slides
A. List methods of dealing with undercuts
B. Design a slide and/or flexi-core lifter injection mold
C. Describe a cylinder actuated core slide
D. Identify various ejector actuated core slides

VII. Runners, Gates and Sprues
A. Know a conventional balanced runner system
B. Identify various styles of gates and their applications
C. Select and apply conventional and heated sprue if necessary

VIII. Mold Cooling
A. Design a single and/or multiple level mold cooling systems including either baffels, thermal pins or bubblers
B. Select and apply mold cooling components

IX. Ejector Systems
A. Select and apply standard ejector components
B. Design a conventional pin and or sleeve ejector system
C. Know and apply a guided ejector system application
D. Apply a stripper plate or ring ejector system to a design if applicable

X. Mold Materials and Heat Treatment
A. Determine the correct mold steel for a given material
B. Select the proper heat treatment

C. List common mold materials

XI. Mold Fabrication and Finishing Processes
   A. Describe various methods of preparing mold cavities
   B. Describe the methods of machining and assembling various mold components
   C. Describe the various methods of polishing or texturing mold cavities

XII. Test and Field Trip
   A. The unit includes six hours of testing
   B. The unit includes field trip time of 4 hours

MINIMUM STUDENT LAB ACTIVITIES:

Evaluate existing plastic product:
Evaluate a plastic product to determine the effects of product design on injection molding capability, the student will sketch the product and identify such features as: sink marks, weld lines, gate marks, ejector marks, flash, flow lines, burns, parting lines and undercuts

Tour the FSU plastics lab:
Instructor explanation of the different molding machines and processes, write a lab report on observations

Detail a plastic product using CAD:
Using a prototype or existing plastic product as a reference the student will completely detail the product to the criteria given by instructor.

Design an A/B Conventional Runner, multiple cavity, CONCEPT injection mold
Detail runner and gates
Given a plastic product or product drawing, the student will design and an injection mold to the criteria as given by instructor.

Design an A/B Conventional Runner, multiple cavity, injection mold
Detail runner and gates
Given a plastic product or product drawing, the student will design and an injection mold to the criteria as given by instructor.

Design / Convert an interchangeable inserted injection mold unit (MUD):
Given a plastic product or product drawing the student will design or sketch an inserted mold unit, either single or multiple cavity, possibly requiring a cam actuated core slide to the criteria as given by instructor.

Design a Lifter Conventional runner, multiple cavity, injection mold using
Detail runner and gates
Given a plastic product or product drawing, the student will design and an injection mold to the criteria as given by instructor

Design a Slide Cold Sprue Conventional runner, multiple cavity, injection mold using
Detail runner and gates
Given a plastic product or product drawing, the student will design and an injection mold to the criteria as given by instructor

Field trip to industry:

Visit mold tool making industry, plastic production industry or a combination of these industries

FERRIS STATE UNIVERSITY
COLLEGE OF TECHNOLOGY
Mechanical Design Department

COURSE SYLLABUS

COURSE TITLE: CDTD 222 Computer Aided Engineering

COURSE DESCRIPTION: The student will use the computer aided molding simulation of thermoplastic mold fill analysis programs to inspect the material database, determine the optimum process feasibility, balance runner systems, create and mesh finite-element models, perform three-dimensional computer aided analysis on the models and read and interpret the data displayed on the models. Students will recognize part defects and understand what causes the defect. The student will also perform static analysis of mechanical products and systems. Computer aided models will be created and meshed with finite elements to be investigated with finite element analysis software. The application of finite element modeling and analysis to tooling, stamped, and plastic products will be emphasized. Students will utilize three dimensional scanning equipment to inspect parts, collect point data, and reverse engineer components.

CREDIT HOURS: Three Semester Hours

CONTACT HOURS: Lecture - 2 Hours/Week
Lab - 3 Hours/Week

PREREQUISITES: CDTD 121, CDTD 122

TEXTBOOKS REQUIRED: Coursepack, CAE & Injection Molding - Bookstore

UNITS OF INSTRUCTION AND STUDENT LEARNING GOALS FOR EACH UNIT:

The student will

I. Introduction to Course and Orientation
   A. Know the course goals, attendance and grading policies
   B. Identify the need and benefits of computer analysis/simulations
   C. Define their role as part of the effort to integrate manufacturing operations

II. Mold filling simulation
   A. Understanding of material properties, material selection variables, and searching databases for material

B. Know how molding processes work
C. Define the design principles of flow analysis software
D. Define molding terminology
E. Know the principles of fluid flow in a molded system
F. Model and modify 3-D geometry and import into software
G. Understand good part design concepts and how part design influences the injection molding process
H. Read graphical outputs and determine if they meet recommendations for a quality molding system
I. Adjust molding parameters to develop a quality molding system
J. Place injection locations and know gate types used for material flow
K. Identify part defects and causes
L. Modify 3-D models to have flow leaders/deflectors
M. Layout parts in a moldbase
N. Design sprues, runners, and gates for naturally and artificially balanced molds
O. Determine runner size for a family mold of parts
P. Model a three plate or hot drop system
Q. Perform a cost analysis of a part

III. Introduction to FEA Analysis
A. Identify units and terms
B. Describe yield strength
C. Describe design stress
D. Apply loading concepts
E. Identify significance of FEM/FEA to statics and strengths of materials
F. Modify part geometry to enhance part performance
G. Understand how to interpret graphical outputs
H. Analyze a weldment for structural failure

IV. Introduction to Reverse Engineering
A. Identify processes to collect data from physical geometry
B. Verify dimensional variation of production components
C. Collect point/surface data by probe collection methods
D. Collect point/surface data by non contact collection methods
E. Generate surface geometry from point data

Daniel C. Wanink

6297 Hickory Drive
Big Rapids, Michigan 49307
Telephone: (231) 592-4961
E-mail:WANINKD@ferris.edu

CAREER OBJECTIVE

To continue to assist students by developing my skills and instruction methods in Design/Manufacturing Technology Education, excel and advance my knowledge in this field while growing within an educational institution by bringing current industry practices into a college level classroom.

EDUCATION

Master of Science Degree in Career and Technical Education
Ferris State University,
Big Rapids, MI 49307 (December 2004)
- *Concentration on Post Secondary Administration*

Bachelor of Science Degree Technical Education **Ferris State University,**
Big Rapids, MI 49307 (May 1997) *Overall G.P.A.=* 3.43
- *Concentration on the Principles of Career and Technical Education*

General Science Teaching Minor **Ferris State University,**
Big Rapids, MI 49307 (May 1997)
- *Concentration on Earth Sciences*

Associate Degree of Applied Science in Technical Drafting and Tool Design
Ferris State University, Big Rapids, MI 49307 (May 1994)
- *Concentration on Mold, Die, Jig & Fixture Design, and CAD*

WORK EXPERIENCE

8-99 to Present *Associate Professor* **Ferris State University**, Big Rapids, MI

Courses taught:

CDTD 111	Fundamentals of Drafting
CDTD 112	Fundamentals of CAD
CDTD 121	Product Detailing
CDTD 122	Solid Modeling
CDTD 222	Computer Aided Engineering
CDTD 390	Three dimensional modeling with CAD
ETEC 140	Engineering Graphics

Student Organization Faculty Advisor:
FSU Association of Tool Designers
Rube Goldberg Machine
SkillsUSA

State Committees Served in past five years
Michigan Design Educators Association (President)
SkillsUSA Michigan Advisory Committee (Post-secondary Rep.)

University Committees Served in past 5 years

FSUS Advisory Committee
University Professional Development Committee
COT Marketing and Student Recruitment Committee
COT Promotion Committee
CET Scholarship Committee
Teacher Education Secondary/Vocational Program Review Panel (03)

Special Projects

Started the Engineering and Technology Summer Camp Program
Coordinate SkillsUSA for the University
Founded the Michigan Design Educators Association
Presented at State of Michigan's Governor's Conference

9-96 to 5-99 *Technical Instructor* **Ferris State University**, Big Rapids, MI

Courses taught:

ETEC 140	Engineering Graphics, Comprehensive
CADD 390 (490)	Computer Aided Engineering for Plastics
TDTD 122	Computer Aided Product Detailing
PDET 322	Model and Prototype Development

Student Organization Faculty Advisor:
Technical Drafting Tool Design Association
Delta Chi Fraternity

Seminars attended: Geometric Dimensioning and Tolerancing

5-98 to 9-00 *Manufacturing Engineering Intern* (Part-time) **Medtronic/DLP Inc.**, Grand Rapids, MI

Responsibilities include design, building, and testing of fixtures for medical product assembly.
Created documentation for training, operating procedures, and maintenance for fixtures and use of laser for a manufacturing process.

8-97 to Present *Industrial Trainer* **Technology Transfer Center** (F.S.U.), Big Rapids, MI

Provided training for Diesel Technology Corporation Pre-Employment Program. Blueprint Reading for Non-traditional students

10-97 to Present *Test Administrator* **Occupational Research and Assessment Center**

Administering of MOCAC Certification Exam for Drafting Occupations.

6-97 to 8-97 *Contractor's Assistant* **Ed Kuula Construction**, Ironwood, MI

5-95 to 8-96 *Injection Mold Designer* **Everson Tool & Machine Ltd.**, Ironwood, MI

Responsible for the design and detailing of precision injection molds.

MEMBERSHIPS

Society of Manufacturing Engineers
SME Rapid Prototyping Association
International Alliance of Teacher Scholars

MARK HILL

13868 Ruby Lane
Big Rapids, MI 49307
(231) 796-5435

EMPLOYMENT OBJECTIVE:

An academic position that would provide growth to an existing program to keep pace with industrial changes, particularly in CAD/CAM, CMM, Rapid Prototyping, design, and model prototyping, or a similar position in industry.

PERSONAL INFORMATION: Birth date: 10/10/51 Height: 6' 0" Health: Excellent Weight: 210 Ibs.
Marital Status: Married, Two children U .S. Citizen

EDUCATION:

FERRIS STATE UNIVERSITY, *Big Rapids, Michigan*
M.S. Occupational Education, August 1988
B.S. Trade Technical Teacher Education, November 1978 Special Emphasis: Manufacturing Related
AA.S. Technical Drafting and Tool Design, May 1977

WORK EXPERIENCE:

1978 - Present:

I am an ***Independent Consultant*** for Tool, Die and Injection Mold Design Design, CAD,Graphics, and Rapid Prototyping.

1996 - Present:

I am a **Service Provider** for the Society of Manufacturing Engineers (SME)
I have reviewed several textbooks, most recently Tool Design 6th Edition for SME

1996 - Present

FERRIS STATE UNIVERSITY, *Big Rapids, Michigan*
Position: **Professor CAD Drafting and Tool Design**
Major responsibilities include:
Teaching, Developing courses in Injection Mold Design Including 3D CAD Solids, Blue Print Reading, Engineering Graphics, Basic AutoCad, Solid Edge Solid Modeling, Parametric Solid Modeling, Product Design CAD

1988 – Present

Subject Matter Expert, and Master Examiner for NOCTI (The National Occupational Competency Testing Institute)

1984 -1995

FERRIS STATE UNIVERSITY, *Big Rapids, Michigan*
Position: **CAD SPECIALIST / ASSOCIATE PROFESSOR**
Major responsibilities include:

. Systems Manager: Maintenance on ComputerVision CADDS 4x mainframe system, Cimlinc Tower and Power CIM Systems, and SUN Engineering workstations as well as PCs. Duties include TCP /IP networking, backups, installations, troubleshooting, conducting training sessions for faculty on changes to systems. Writing C programs and Unix shells for various applications, including DNC to machine controllers, CMM data to CAD, plotting, and printing.

. Stereolithography Manager: Install/maintain/troubleshoot SLA-250 Rapid Prototyping System. Conducted industrial training sessions on SLA applications. Have built many complex SLA models. Instructional duties include teaching courses in Blueprint Reading, Engineering Graphics, Drafting, Introduction to Technology, Introduction to CAD, Advanced CAD including complex surfacing, model and prototyping, FEM/FEA, and Stereolithography.

1978 -1984

ACME INSTITUTE OF TECHNOLOGY, *South Rend, Indiana*
Position: **DESIGN DEPARTMENT HEAD -LEAD INSTRUCTOR**
Major projects and responsibilities included:
Meeting with the Japanese Acme School periodically to inform them of text and method of operation changes. Initiated, organized, and conducted the selling of thee Cope System franchises to the Korean government and the Grand Rapids, Michigan and Huntsville, Alabama locations, Editing, rewriting the Cope System materials and informing all associate schools of the changes. Successfully conducted the Korean instructor training sessions. Established a 36-week numerical control program including basic, Manual and Compac II programming. Responsibilities within the classroom included teaching Tool, Die, Plastics Mold Design courses (48 weeks Each). Other courses successfully taught include Algebra, Geometry, Trigonometry, Mechanical Drawing, Descriptive Geometry, Basic Computer Programming, Basic Numerical Control, Compac II, and Strength of Materials.

GENERAL INFORMATION:

I enjoy most all-outdoor activities, especially skiing, camping, and water sports.
I am a member of The Society of Manufacturing Engineers (SME).

REFERENCES:

Both employment and personal references attached..

RESUME

Todd N. Rose
Phone 616 / 874-8993

PERSONAL

Birth Date: 1-6-45
Height / Weight: 6'3" / 195
Physical Health: Excellent

Married
Children: Three
U.S. Citizen

EDUCATION

1975 M.S. degree in Industrial Management
Western Michigan University

1968 B.S. degree in Trade Technical Education
Ferris Sate University

1965 A.A.S. degree in Technical Drafting and Tool Design
Major - Die Design
Ferris State University

1963 Graduated from Ottawa Hills High School

ADDITIONAL TRAINING

Progressive Die Design Seminar
CAD - CIMLINC, Auto-Cad, Computervision,ProE
Engineering Project Management - Westinghouse
Value Analysis - Westinghouse
Carboloy Tooling Seminar
Robotics - Unimate and GMF
Industrial Truck Design
Plant Layout and Material Handling
Electronics

PROFESSIONAL ORGANIZATIONS

Society of Manufacturing Engineers
Society of Body Engineers

PATENTS

4,719,727

4,850,176

INDUSTRIAL EXPERIENCE

1988 - Present Associate Professor - Manufacturing Engineering Technologies Department Ferris State University, Big Rapids, Michigan

Major duties: Teach technical drafting,CAD, descriptive geometry, product, tool, and die design.

Summer positions: Prince Corp., Diesel Tech., Ridgeview Stamping, Precision Metalforming Association, MSI, Capital Engineering.

1982 - 1988 Engineering Manager - C-Tec Inc Grand Rapids, Michigan

Products: Access Flooring for computer rooms and offices

Major duties: Manage and direct product design / devolopment, manufacturing engineering and facilities

Major completions:
- Directed task force to relocate and start up new company
- Implemented several new product designs
- Created major cost savings through design and manufacturing
- Installed a welding robot and stacking robot

1979 - 1982 Manufacturing Engineer - Westinghouse Electric, Grand Rapids, Michigan

Products: Open Office Systems

Major duties: Planned and implemented plant rearrangement projects; economic justification for capital expenditures; cost reductions programs; identify, develop and recommend new method

improvements. Also, planning, purchasing, and implentation of equipment for storage, work flow and material handling of raw / finished goods.

Major completions:
- **Improved productivity capacity 100% on flooring product line**
- **Implement JIT program**
- **Improved quality of flooring products**
- **Installed major receiving / shipping converyor system**
- **Installed hi-rise warehousing**
- **In charge of product relocation to C-Tec**

1969 - 1982 Instructor (part time) - National Apprenticeship Program Kellogg Community College, Battle Creek, Michigan

Major Duties: Teach technical drafting, blueprint reading and tool design for apprentice tool-die, machine repair and machinists.

1976 - 1979 Project Engineer - Kelvinator-White Consolidated, Grand Rapids, Mich.

Products: Consumer products - electric ranges

Major duties: Managed projects - design, development and testing.

Major completions:
- **Modular countertop range**
- **Tri-level range with microwave oven**
- **Glass top countertop range**

1974 - 1975 Supervisor - Tool Design - Rockwell International, Battle Creek, Michigan

Products: Off-Highway components - brakes, special speed reducers,

and mass transit units.

Major duties: Supervised plant start-up, tooling, tool design, gaging, processing and cost estimating.

Major completions:
- **Plant start-up**
- **Design and implement disk brake caliper machining center**

1971 - 1974 Methods Engineer - Eaton Engine Component Div., Battle Creek, Michigan

Products: Automotive and truck internal combustion engine valves

Major duties: Co-ordinate machine set-ups, improve production methods, economic justification for capital equipment purchases, tooling justification and procurement, work standards and design.

Major completion:
- **Design machine to combine five machining operations into one.**

1968 - 1971 Designer Draftsman - Clark Equipment Co., Battle Creek, Michigan

Products: Industrial fork-lift trucks

Major duties: Design, development, testing, proto-type, tooling and production follow-up for electric fork- lift trucks.

Major completion:
- **Development of new 6000-8000 lb. electric rider trucks**

1966 - 1967 Die Designer - Kirsch Company , Sturgis, Michigan

Products: Drapery Hardware

Major duties: Design progressive dies for drapery hardware

CAD DRAFTING & TOOL DESIGN
(AAS DEGREE)

SELF STUDY

FOR

ACADEMIC PROGRAM REVIEW

FERRIS STATE UNIVERSITY
COLLEGE OF ENGINEERING TECHNOLOGY

AUGUST 2009

TABLE OF CONTENTS

SECTION 1

OVERVIEW OF PROGRAM

MISSION OF THE CAD DRAFTING TOOL DESIGN TECHNOLOGY PROGRAM

To provide students with the ability to succeed academically and become independent problem solvers. The program strives to provide students with the necessary skills in computer aided design and tool design to meet the needs of industry for entry level employment.

PROGRAM HISTORY

The CAD Drafting Tool Design program is the foundation for skilled designers and is one of the major support programs to Ferris States Bachelor's Degrees. The CAD Drafting Tool Design program has its origin as the Mechanical Drafting program in 1947 with seven students. Today, with over 1,385 graduates, it is one of the primary providers of students into the Product Design Engineering Technology, Manufacturing Engineering, Career Technical Education, Mechanical Engineering Technology and Plastics Bachelors Degrees with the 2+2 laddering concept at Ferris State. The CAD Drafting Tool Design program is a critical component to the overall success of graduates from the Product Design and Manufacturing BS degree programs. Graduates are able to seek gainful, career positions in industry after completion of the two year CAD Drafting and Tool Design program if they elect not to earn a bachelor's degree. Several of our graduates have accepted employment and continued their education at our campus in Grand Rapids or other satellite campuses.

The CAD Drafting Tool Design program is an applied technology program and is a provider of CAD/draftsman for Product, Tool, Die, Gage, and Injection Mold designers to the State of Michigan as well as the Great Lakes region of the United States. With a major initiative for CAD/CAM (Computer Aided Drafting and Computer Aided Machining) applications in the fall of 1983, the CAD Drafting Tool Design program started a major change in curricula. Many major changes in applied CAD/CAM and related technologies have been incorporated into the curriculum. Advisory committee, industry surveys, alumni surveys and faculty plans have been identified and implemented to make the CAD Drafting Tool Design current to industries needs and requirements.

One of the most significant changes in industry has been the use of prototyped products and the new technologies to generate them. The CAD Drafting Tool Design program has responded by developing its own Rapid Prototyping Center. We are able to provide students with the latest technology as well as working with high school programs and career centers in Michigan.

CURRENT PROGRAM STATUS

Support for the various CAD/CAM labs that the CAD Drafting Tool Design Program uses have come from two major sources. The initial CAD/CAM lab that the CAD Drafting Tool Design program used was the former college wide "CAD/CAM lab" which was an open lab for all college of technology students. We then used Vocational Education (Voc. Ed.) funds to establish a dedicated CAD lab for its students. More recently we obtained donations from industry and revitalization funds from the university and have opened a new "state of the art" CAD lab used by our second year students. This planning and implementation of the new lab was vital to the continued success of our program.

The CAD Drafting Tool Design program has worked with a consistently reduced budget the past several years. The cost of supplies and equipment are on a constant rise and we do not receive sufficient funds from the College of Engineering Technology department budget. Donations from industry and faculty as well as passing along some costs to the students have allowed the CAD Drafting Tool Design program to remain status quo. Annual discussions of the future availability and amounts of vocational educational funds for computers, supplies and equipment will need attention.

Enrollment in the CAD Drafting Tool Design program has been stable over the years but we have been experiencing a slight reduction the last couple years. We are sure this is due to tough economic times and high costs. The faculty has implemented a basic strategy for recruitment at schools that have consistently sent high school graduates to the CAD Drafting Tool Design program. In addition, we host the Michigan Designers Educator Association, provide poster w/reply cards, summer camps, Dog Days, spring open house, individual tours and school visits. Our continued efforts to work with high school programs to attract students, we believe, will increase the interest and enrollment in our program.

Placement in the CAD Drafting Tool Design program is consistent with other "feeder programs" at Ferris State. High numbers of CAD Drafting Tool Design graduates go on for a BS degree. The program continues to monitor the equipment and facilities with the hope of establishing software and equipment replacement initiatives for the programs continued success. Many companies have visited

Ferris State campus in hopes of recruiting CAD Drafting Tool Design graduates. Those lucky enough to hire our graduates often call or write indicating that the students are well prepared and "do you have any more like the one I hired". (example: Northrop Grumman, New Port News,VA, spring '08). Many graduates respond back in a similar tone as can be seen in comments in Section 2 of this report. The CAD Drafting Tool Design program has long been recognized as a leader in providing highly qualified entry-level Tool Designers and CAD operators for industry. The program has developed a Rapid Prototyping Center (RPC) and an advanced inspection area. The RPC and inspection area is being used by our students and College of Engineering Technology students and is made available to all programs at Ferris State University. The advanced equipment and design capability has also provided an excellent recruiting tool.

A. PROGRAM GOALS

A.1 State goals of program:

The CAD Drafting Tool Design Technology degree is designed to prepare students to enter industry as technical draftsmen, detailers , entry level tool designers and CAD operators. The program is compatible with the FSU mission statement, by providing hands-on, laboratory based career education and training incorporating current technology.

A.2 Explain how and by whom goals were established:

The ultimate goals of the Ferris CAD design program remain constant. The educational path to meeting those goals changes as the needs for industry demand. The feedback and input from a variety of sources, including students, faculty, program alumni, advisory board members and employers keep the Ferris CAD design program as current as possible. The final decision on program goals, and attainment of those goals, rests with the department faculty.

A.3 How do the goals apply to preparing students for careers in and meeting employer needs in the community / region / marketplace?

The goals of the program were determined based on the needs of industry. The various industries in which our program graduates enter are truly international . Many North American based companies have international business activities. Feedback from employers and alumni has indicated that graduates have been quick to adapt to the community / region / marketplace needs of employers.

A.4 Have the goals changed since last program review? If so, why and how? If not, why not?

As stated above in A.2, the ultimate goals have remained constant for the CAD design program. In order to continue to meet the program goals, several curriculum modifications

have been implemented since our last APR process. These changes have been implemented based on industry changes, program alumni, advisory board members and employers.

A.5 Describe the relationship of the program goals to the University's mission, and departmental, college and divisional strategic plans.

Faculty teach Engineering Graphics and CAD courses for the Welding Technology, Plastic Engineering Technology program, Heavy Equipment, Electronics and Mechanical Engineering programs. The CDTD program ladders into the B.S. Manufacturing Engineering Technology, Product Design Engineering Technology, Plastics Engineering Technology, Mechanical Engineering Technology and Career & Technical Education programs. The program is compatible with the FSU mission statement, by providing hands-on, laboratory based career education and training incorporating current technology.

B. PROGRAM VISIBILITY AND DISTINCTIVENESS

B.1 Describe any unique features or components of the program.

The CAD Drafting & Tool Design program is unique to the State of Michigan and the Great Lakes region because it the only program to combine CAD and Tool Design. We provide "value added" vs. other two year programs. We are unique because we stress innovation, design and problem solving as part of the students education. In addition, we offer a Rapid Prototype Center and advanced inspection area.

B.2 Describe and assess the programs ability to attract quality students.

The CAD Drafting & Tool Design program has a long history of excellence and students are attracted to the opportunity to continue in the four year degree programs. Also, our relationship with secondary schools and CAD instructors, as well as the Michigan Designers Education Association, plays a key role in attracting students who want to continue their education.

B.3 Indentify institutions that are the main competitors for prospective students.

Our biggest competition is from community colleges. Even thought we offer a much better program, the costs to attend Ferris make attending very difficult.

a. The major difference between our program and community college programs is the amount of practical hands-on training and depth of subject matter.
b. The Ferris CAD Drafting & Tool Design program is viewed by industry and many career centers as the leading technology in CAD Drafting & Tool Design.

C. PROGRAM RELEVANCE

C.1 Provide labor market demand analysis:

The following Labor Market Analysis was provided by Ms. Fran Rosen, FSU FLITE

The CAD Drafting and Tool Design Technology program educates future injection mold designers, metal stamping die designers and machine designers who, , at times, work closely

with product designers, mechanical engineers and manufacturing engineers. Tool designers are an important member of the design engineering team. Graduates of the program find immediate employment as computer-aided tool detailers, product drafters, entry-level tool designers, CAD operators and other technical-related positions. Approximately 2/3 of the students choose to continue into B.S. programs such as Product Design Engineering Technology, Manufacturing Engineering Technology, Plastics Engineering Technology, Business Management or Occupational (Teacher) Education.

The US Department of Labor Bureau of Labor Statistics (BLS) projects an employment growth from 2006 to 2016 of 7.61 % for Drafters, engineering and mapping technicians, which is about as fast as average for all occupations. The BLS suggests that "Competitive pressures will force companies to improve and update manufacturing facilities and product designs, resulting in more jobs for engineering technicians. " While the BLS does warn that employment growth in some design functions may be low due to jobs moving overseas, they do feel that the requirement that technicians be on-site means that there will still be job growth in the US.

The Manufacturing Industry is not expected to grow (5.82% decrease in jobs projected) but other sectors of the economy should see significant growth and provide opportunities. Tool design and drafting will be required to support development in environmental engineering technology, for example. The BLS projects a 28.71% increase in jobs for drafters and engineering technicians in the fields of waste management and remediation services.

"5 Tech Jobs for Career Changers" Yahoo, September 2008

Computer-Aided Drafting Specialist

Job market trends may change, but one thing will always stay the same – design concepts have to go from human to computer somehow. Dedicated to turning engineering concepts into three-dimensional computer models, CAD specialists find work in a wide array of engineering firms. The median salary of nearly $40,000 according to Salary.com, computer-aided drafting is an ideal field for employees looking to make a high-tech switch

"Improving Career Training Options Remains Key to Jobs Future" Labor Voice, Iris K. Salters, President of MEA

The Future Business Index Study, which surveyed employers and found Michigan's high unemployment rate has more to with a lack of necessary education and training than with a lack of employment opportunities.
Many students and their parents don't realize it's increasingly impossible for workers without post-high school training to find good jobs.
At the dropout hearings, employers told us schools must offer hands-on training in key areas like business, medical and professional services, creating a highly skilled work force.
Some of these careers don't require a four-year degree, but all require technical training.
Our schools can position Michigan again as a leader in innovation and technology.

Key Demand Occupations – 2012 – **Grand Rapids Area**

College Degree Required

Education	Title / Description / Key Skills	Projected Job Growth	% Job Growth 2002 - 2012	Hourly Wage
	Computer Systems Analysts (15-1051)	565	44.4%	$30.40
Bachelor's	Analyze science, engineering, business, and all other data processing problems for application to electronic data processing systems. Analyze user requirements, procedures, and problems to automate or improve existing systems and review computer system capabilities, workflow, and scheduling limitations. **Key Skills:** Active Learning, Reading Comprehension, Complex Problem Solving, Critical Thinking, Active Listening			
	Industrial Engineers (17-2112)	330	25.1%	$28.90
Bachelor's	Design, develop, test, and evaluate integrated systems for managing industrial production processes including human work factors, quality control, inventory control, logistics and material flow, cost analysis, and production coordination. **Key Skills:** Critical Thinking, Active Listening, Time Management, Reading Comprehension, Complex Problem Solving			
	Mechanical Engineers (17-2141)	315	15.9%	$31.39
Bachelor's	Perform engineering duties in planning and designing tools, engines, machines, and other mechanically functioning equipment. Oversee installation, operation, maintenance, and repair of such equipment as centralized heat, gas, water, and steam systems. **Key Skills:** Mathematics, Complex Problem Solving, Critical Thinking, Reading Comprehension, Science			
	Commercial and Industrial Designers (27-1021)	165	23.6%	$24.63
Bachelor's	Develop and design manufactured products, such as cars, home appliances, and children's toys. Combine artistic talent with research on product use, marketing, and materials to create the most functional and appealing product design. **Key Skills:** Time Management, Active Listening, Reading Comprehension, Mathematics, Judgment and Decision Making			
	Graphic Designers (27-1024)	260	27.3%	$22.29
Associate's	Design or create graphics to meet a client's specific commercial or promotional needs, such as packaging, displays, or logos. May use a variety of mediums to achieve artistic or decorative effects. **Key Skills:** Time Management, Coordination, Active Listening, Judgment and Decision Making, Active Learning			
	Public Relations Specialists (27-3031)	230	28.4%	$20.74
Bachelor's	Engage in promoting or creating good will for individuals, groups, or organizations by writing or selecting favorable publicity material and releasing it through various communications media. May prepare and arrange displays, and make speeches. **Key Skills:** Writing, Critical Thinking, Reading Comprehension, Active Listening, Judgment & Decision Making			

C.2 Describe and assess how the program responds to emerging issues in the discipline, changes in the labor force, changes in employer needs, changes in student needs, and other forces of change.

The CAD Drafting & Tool Design program strives to continuously assess whether the educational objectives of the program are well-aligned with the needs of industry and are being achieved by graduates. Assessment can only be done by staying in constant dialog with alumni and employers with regard to the program. The CAD Drafting & Tool program uses industrial advisory board and alumni, industry surveys. Program faculty constantly visit various design and design build tooling companies.

These measures allow the CDTD program to assess whether the program objectives are in line with industry needs and if graduates are well-prepared to successfully meet these objectives.

C.3 Assess why students come to FSU for the program.

The primary reason students attend the CAD Drafting & Tool Design program is the excellent employment opportunities the degree provides. Also, the opportunity to continue their education at Ferris in the 2 + 2 educational concept. They can choose from several programs for a four year degree after graduating from our program.

D. PROGRAM VALUE

D.1 Describe the benefit of the program, facilities, and personnel to the University.

The CAD Drafting & Tool Design program has been providing qualified graduates to the many design and manufacturing industries for many years. In addition, we have provided many students to further their education at Ferris in Product Design, Manufacturing Engineering, Plastic Engineering and Technical Education B. S. degrees. The demand for Ferris design graduates is very strong.

This industry demand has resulted in steady enrollment. This enrollment benefits all aspects of the University as students continue their education. In addition, students are required to take courses outside of the department and College of Engineering Technology to complete their academic degree requirements.

D.2 Describe the benefit of the program, facilities, and personnel to the students enrolled in the program.

The CAD Drafting & Tool Design problem has been providing qualified CAD drafting graduates to various facets of industry for many years.

The facilities have been developed over the years and is second to none when compared to similar academic educational facilities. The equipment and software used for student learning is state-of-art thanks to the excellent relationship with industry that was established by department faculty.

The faculty brings a combination of 83 years of teaching and industry experience to the students. This longevity provides a tremendous learning benefit to our students. The faculty can combine mandatory academics with real life industrial experiences.

D.3 What is the assessment of program personnel of the value of the program to employers? Explain how this value is determined.

The CAD program has a very effective Industrial Advisory Board. The members represent a variety of design and manufacturing industries. The value of qualified program faculty is of primary concern to them. Many of the organizations represented by advisory board members currently employ Ferris CAD Drafting & Tool Design graduates.

D.4 Describe the benefit of the program, faculty, staff and facilities to entities external to the University (services that faculty have provided to accreditation bodies, and regional, state, and national professional associations; manuscript reviewing; service on editorial boards; use of facilities for meeting, etc.

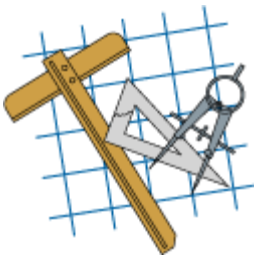
The program faculty are active in Society of Manufacturing Engineers (SME). SME serves 60,000+ members worldwide. Membership consists of engineers, scientists, educators, researchers, designers, company executives and officers, and salesman.

The Ferris Association of Tool Designers is a FSU registered student organization. The Association of Tool Designers is run by students and advised by faculty member Dan Wanink. The chapter has done many student activities as well as community projects. The CDTD program has hosted the annual Michigan Educators Designers Association held in Big Rapids.

CDTD faculty is often involved with entities outside of the University community. Past activities have included secondary educational advisory boards, professional society committees, and local community organizations. CDTD faculty have reviewed and edited professional publications at various times.

D.5 What service for extra-University general public groups (e.g., presentations in school or to community organizations) have faculty, staff or students provided? Describe how these services benefit students, program, and community.

The CDTD faculty, staff and students are engaged in the Big Rapids and Rockford communities. As community members, many department individuals are active with youth and community projects. The CDTD student organization also serves the community.



2.A. GRADUATE FOLLOW-UP SURVEY: The purpose of this activity is to learn from graduates their perceptions and experiences regarding employment based on program outcomes. The goal is to assess effectiveness of the program in terms of job placement and preparedness of the graduate for the marketplace.

CAD Drafting Tool Design
Academic Program Review

Alumni

Frequencies

Prepared by: Institutional Research & Testing, 04/09

Statistics

	N		Mean	Median	Std. Deviation
	Valid	Missing	Valid	Missing	Valid
q1a Interpreting Engineering Drawings	11	0	3.91	4.00	.302
q1b CAD Fundamentals	11	0	4.00	4.00	.000
q1c CAD Tool Detailing	11	0	3.91	4.00	.302
q1d Product Detailing	11	0	3.73	4.00	.467
q1e CAD Solid Modeling	11	0	3.91	4.00	.302
q1f Computer Aided Engineering	11	0	3.73	4.00	.467
q1g Tool Design	10	1	3.60	4.00	.516
q1h Die Design	11	0	3.73	4.00	.467
q1i Mold Design	11	0	3.64	4.00	.505
q1j Basic Machine Tool Operations	11	0	3.91	4.00	.539
q1k Advanced Machine Tools w/ CAM	11	0	3.36	3.00	.809
q1l Physics (general)	11	0	3.00	3.00	.894
q1m Material Science	11	0	3.55	4.00	.522
q1n English	11	0	3.18	4.00	1.079
q1o Communications	11	0	3.09	3.00	1.044
q1p Electives	10	1	2.80	3.00	.789
q2a Overall technical education	11	0	3.64	4.00	.505
q2b Gaining a broad general education	11	0	3.73	4.00	.467
q2c Writing clearly & effectively	11	0	3.18	3.00	.603
q2d Acquiring proficiency utilizing CAD	11	0	3.82	4.00	.405
q2e The ability to learn on your own	11	0	3.64	4.00	.674
q2f The ability to adjust to different CAD software	11	0	3.18	3.00	.751
q3 Recommend program to friend/relative	11	0	3.64	4.00	.505
q4 How satisfied with overall experience	11	0	3.64	4.00	.505
q5 Do you collaborate via Electronic Viewers and Mark-ups	11	0	1.64	2.00	.505
q6 What software is used and how often	11	0			
q7 BS in MET, PLTE, or PDET	11	0	1.45	1.00	.522
q8 How did your CAD skills help or hurt you	11	0			
q9 Most valuable part of coursework	11	0			
q10 Least valuable part of coursework	11	0			
q11 Courses/topics should be included/changed in program	11	0			
q12 What did you think of the CDTD facilities and software	11	0			
q13 Trends in the Drafting & Tool Design industry see impacting	11	0			
q14 Receive a BS degree from Ferris	11	0	1.36	1.00	.505
q15 From what program	7	4	4.57	5.00	.787
q15a Other program specified	11	0			
q16 Receive a BS degree from another university	11	0	2.00	2.00	.000
q17 Name of degree and university	11	0			
q18 Starting salary range after graduation	11	0	2.27	3.00	1.104
q19 Present salary range	11	0	3.45	4.00	1.916
q20 Was it difficult to find a position in Drafting/Tool Design	11	0	1.55	2.00	.522
q21 Year you graduated	11	0			
q22 Present job title	11	0			
q23 Employer/Company name	11	0			
q24 Employer/Company mailing address	11	0			

Frequency Table

q1a Interpreting Engineering Drawings

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	1	9.1	9.1	9.1
	Strongly Agree	10	90.9	90.9	100.0
	Total	11	100.0	100.0	

q1b CAD Fundamentals

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	11	100.0	100.0	100.0

q1c CAD Tool Detailing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	1	9.1	9.1	9.1
	Strongly Agree	10	90.9	90.9	100.0
	Total	11	100.0	100.0	

q1d Product Detailing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	3	27.3	27.3	27.3
	Strongly Agree	8	72.7	72.7	100.0
	Total	11	100.0	100.0	

q1e CAD Solid Modeling

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	1	9.1	9.1	9.1
	Strongly Agree	10	90.9	90.9	100.0
	Total	11	100.0	100.0	

q1f Computer Aided Engineering

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	3	27.3	27.3	27.3
	Strongly Agree	8	72.7	72.7	100.0
	Total	11	100.0	100.0	

q1g Tool Design

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	4	36.4	40.0	40.0
	Strongly Agree	6	54.5	60.0	100.0
	Total	10	90.9	100.0	
Missing	System	1	9.1		
Total		11	100.0		

q1h Die Design

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	3	27.3	27.3	27.3
	Strongly Agree	8	72.7	72.7	100.0
	Total	11	100.0	100.0	

q1i Mold Design

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	4	36.4	36.4	36.4
	Strongly Agree	7	63.6	63.6	100.0
	Total	11	100.0	100.0	

q1j Basic Machine Tool Operations

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	2	18.2	18.2	18.2
	Strongly Agree	8	72.7	72.7	90.9
	Not Applicable	1	9.1	9.1	100.0
	Total	11	100.0	100.0	

q1k Advanced Machine Tools w/ CAM

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	1	9.1	9.1	9.1
	Somewhat Agree	6	54.5	54.5	63.6
	Strongly Agree	3	27.3	27.3	90.9
	Not Applicable	1	9.1	9.1	100.0
	Total	11	100.0	100.0	

q1l Physics (general)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	9.1	9.1	9.1
	Somewhat Disagree	1	9.1	9.1	18.2
	Somewhat Agree	6	54.5	54.5	72.7
	Strongly Agree	3	27.3	27.3	100.0
	Total	11	100.0	100.0	

q1m Material Science

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	5	45.5	45.5	45.5
	Strongly Agree	6	54.5	54.5	100.0
	Total	11	100.0	100.0	

q1n English

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	9.1	9.1	9.1
	Somewhat Disagree	2	18.2	18.2	27.3
	Somewhat Agree	2	18.2	18.2	45.5
	Strongly Agree	6	54.5	54.5	100.0
	Total	11	100.0	100.0	

q1o Communications

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	9.1	9.1	9.1
	Somewhat Disagree	2	18.2	18.2	27.3
	Somewhat Agree	3	27.3	27.3	54.5
	Strongly Agree	5	45.5	45.5	100.0
	Total	11	100.0	100.0	

q1p Electives

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	9.1	10.0	10.0
	Somewhat Disagree	1	9.1	10.0	20.0
	Somewhat Agree	7	63.6	70.0	90.0
	Strongly Agree	1	9.1	10.0	100.0
	Total	10	90.9	100.0	
Missing	System	1	9.1		
Total		11	100.0		

q2a Overall technical education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	4	36.4	36.4	36.4
	Strongly Agree	7	63.6	63.6	100.0
	Total	11	100.0	100.0	

q2b Gaining a broad general education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	3	27.3	27.3	27.3
	Strongly Agree	8	72.7	72.7	100.0
	Total	11	100.0	100.0	

q2c Writing clearly & effectively

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	1	9.1	9.1	9.1
	Somewhat Agree	7	63.6	63.6	72.7
	Strongly Agree	3	27.3	27.3	100.0
	Total	11	100.0	100.0	

q2d Acquiring proficiency utilizing CAD

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	2	18.2	18.2	18.2
	Strongly Agree	9	81.8	81.8	100.0
	Total	11	100.0	100.0	

q2e The ability to learn on your own

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	1	9.1	9.1	9.1
	Somewhat Agree	2	18.2	18.2	27.3
	Strongly Agree	8	72.7	72.7	100.0
	Total	11	100.0	100.0	

q2f The ability to adjust to different CAD software

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	2	18.2	18.2	18.2
	Somewhat Agree	5	45.5	45.5	63.6
	Strongly Agree	4	36.4	36.4	100.0
	Total	11	100.0	100.0	

q3 Recommend program to friend/relative

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Likely	4	36.4	36.4	36.4
	Very Likely	7	63.6	63.6	100.0
	Total	11	100.0	100.0	

q4 How satisfied with overall experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Satisfied	4	36.4	36.4	36.4
	Very Satisfied	7	63.6	63.6	100.0
	Total	11	100.0	100.0	

q5 Do you collaborate via Electronic Viewers and Mark-ups

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	4	36.4	36.4	36.4
	No	7	63.6	63.6	100.0
	Total	11	100.0	100.0	

q6 What software is used and how often

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		7	63.6	63.6	63.6
	Catia V5	1	9.1	9.1	72.7
	edrawings, once a month	1	9.1	9.1	81.8
	SolidWorks / Daily	1	9.1	9.1	90.9
	Teamcenter, Oracle, PTC based Windchill	1	9.1	9.1	100.0
	Total	11	100.0	100.0	

q7 BS in MET, PLTE, or PDET

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	6	54.5	54.5	54.5
	No	5	45.5	45.5	100.0
	Total	11	100.0	100.0	

q8 How did your CAD skills help or hurt you

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		7	63.6	63.6	63.6
	Basic knowledge of drawings and standards assisted in review of engineering change requests.	1	9.1	9.1	72.7
	in my job or in the PDET program? Very helpful for my job.	1	9.1	9.1	81.8
	It helped me to develop parts that are friendly from a manufacturing and assembly stand point.	1	9.1	9.1	90.9
	These skills helped me to understand different techniques in doing CAD work to make work time quicker and easier. An understanding in one CAD software helps in learning other softwares.	1	9.1	9.1	100.0
	Total	11	100.0	100.0	

q9 Most valuable part of coursework

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		4	36.4	36.4	36.4
	All of the core CDTD classes were very valuable. all very necessary especially if you arent 100% sure what area you want to go into.	1	9.1	9.1	45.5
	For my work I benefited the most from understanding of the tools materials used in manufacturing and also visualizing parts depicted in 2D drawings. Drawing and dimensioning practices has also been helpful.	1	9.1	9.1	54.5
	I feel that Advanced Machine Tool was the most valuable course, as it was a practical and hands on experience of the all areas of the degree. I would also note the board drafting portion was very valuable as I found many younger employees are lacking the general drafting skills that really are the foundation of the trade.	1	9.1	9.1	63.6
	Many of the classes gave you real life situations to work out different problems. Everything was hands-on so I was able to jump right in and test things out. I was also able to use my creativity which I believe many people are looking for to express themselves through their work.	1	9.1	9.1	72.7
	Mold Development along with Die Development.	1	9.1	9.1	81.8
	Technical drawing understanding. In the engineering field, drawings are usually a major part of any design project.	1	9.1	9.1	90.9
	The fundamentals of CAD and the overview of many types of tooling allowed me to move up quicker in the work force.	1	9.1	9.1	100.0
	Total	11	100.0	100.0	

q10 Least valuable part of coursework

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		5	45.5	45.5	45.5
	Hand drawing of molds and dies, the 100 level courses gave sufficient skill in drafting.	1	9.1	9.1	54.5
	I am not so sure how helpful the drawing board experience was. Maybe it helped me mentally translate 2D objects shown in multiple views translate to 3D objects?	1	9.1	9.1	63.6
	I can't recall any at this point in time.	1	9.1	9.1	72.7
	I honestly feel every portion of the coursework was and is useful in a technology industry.	1	9.1	9.1	81.8
	I saw the need for all the classes so I would have to say the gen. ed. classes were the least valuable.	1	9.1	9.1	90.9
	The board drawings because they really arent being used anymore.	1	9.1	9.1	100.0
	Total	11	100.0	100.0	

q11 Courses/topics should be included/changed in program

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		5	45.5	45.5	45.5
	Drafting tables were a lost art a long time ago. I don't think we will return to that era so do away with drawing on the tables, unless it is a sketching class to express a drawing, but no technical drawings on the board.	1	9.1	9.1	54.5
	I feel it would be a good idea to add an understanding for CAD management and/or programing, as these issues can really set one apart from the average draftsperson	1	9.1	9.1	63.6
	Mechanical testing (design, protocols, measurement instruments, test machines, and test report writing). Also, standard practices for lab notebook keeping/documentation. Also, project management classes.	1	9.1	9.1	72.7
	More courses on the fundamentals of manufacturing and lean manufacturing would help students advance quicker in the work force.	1	9.1	9.1	81.8
	The GD & T portion of the class should be taught to the ASME 1994 standard using real life applications.	1	9.1	9.1	90.9
	Working with shrink rates or windage & warp being placed into injection Molds for conpensation during processing.	1	9.1	9.1	100.0
	Total	11	100.0	100.0	

q12 What did you think of the CDTD facilities and software

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		4	36.4	36.4	36.4
	At the time of graduation I felt very comfortable with the software learned and although at times I found the computers to be lacking hardware needed to perform at peak performance. After graduation, I realized technologies at different companies to vary. I think knowledge in multiple software would have been very helpful, not probably practical within an Associates degree, but useful.	1	9.1	9.1	45.5
	Excellent!	2	18.2	18.2	63.6
	Great.	1	9.1	9.1	72.7
	It was slowly impoving. Last i looked things were good.	1	9.1	9.1	81.8
	The facilities met my needs well but the software seemed to be behind the times with the onset of full parametric modeling software's.	1	9.1	9.1	90.9
	The setup was great and the software was also great to learn on.	1	9.1	9.1	100.0
	Total	11	100.0	100.0	

q13 Trends in the Drafting & Tool Design industry see impacting

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		5	45.5	45.5	45.5
	Being able to make changes quickly / cheaply. Take a template part designs and modify them to work for another application. Being able to design and engineer at the same time.	1	9.1	9.1	54.5
	I would say just the technological advances are always expanding and new inovations and software will dramatically be improved.	1	9.1	9.1	63.6
	Model Centric - meaning all dimensions and applicable tolerances are built into models rather than 2D drawings.	1	9.1	9.1	72.7
	N/A	1	9.1	9.1	81.8
	Rapid prototyping technologies and materials have had an enormus impact on product development, testing, and sometimes even manufacturing.	1	9.1	9.1	90.9
	Technology, software choice, and a call from industry to "cross-training". Training based more towards both CAD Operator and Project Management.	1	9.1	9.1	100.0
	Total	11	100.0	100.0	

q14 Receive a BS degree from Ferris

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	7	63.6	63.6	63.6
	No	4	36.4	36.4	100.0
	Total	11	100.0	100.0	

q15 From what program

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Manufacturing Engineering	1	9.1	14.3	14.3
	Education	1	9.1	14.3	28.6
	Product Design	5	45.5	71.4	100.0
	Total	7	63.6	100.0	
Missing	System	4	36.4		
Total		11	100.0		

q15a Other program specified

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		11	100.0	100.0	100.0

q16 Receive a BS degree from another university

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	11	100.0	100.0	100.0

q17 Name of degree and university

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		11	100.0	100.0	100.0

q18 Starting salary range after graduation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than $29,999	4	36.4	36.4	36.4
	$30,000-$39,999	1	9.1	9.1	45.5
	$40,000-$49,999	5	45.5	45.5	90.9
	$50,000-$59,999	1	9.1	9.1	100.0
	Total	11	100.0	100.0	

q19 Present salary range

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than $29,999	3	27.3	27.3	27.3
	$30,000-$39,999	1	9.1	9.1	36.4
	$40,000-$49,999	1	9.1	9.1	45.5
	$50,000-$59,999	1	9.1	9.1	54.5
	$60,000-$69,999	4	36.4	36.4	90.9
	$70,000-$79,999	1	9.1	9.1	100.0
	Total	11	100.0	100.0	

q20 Was it difficult to find a position in Drafting/Tool Design

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	5	45.5	45.5	45.5
	No	6	54.5	54.5	100.0
	Total	11	100.0	100.0	

q21 Year you graduated

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	9.1	9.1	9.1
	1999	2	18.2	18.2	27.3
	2001	2	18.2	18.2	45.5
	2002	1	9.1	9.1	54.5
	2003	1	9.1	9.1	63.6
	2004	2	18.2	18.2	81.8
	2005	1	9.1	9.1	90.9
	2007	1	9.1	9.1	100.0
	Total	11	100.0	100.0	

q22 Present job title

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	9.1	9.1	9.1
	CAD Operator	1	9.1	9.1	18.2
	Camp Director	1	9.1	9.1	27.3
	Corporate Tooling Engineer	1	9.1	9.1	36.4
	design engineer	1	9.1	9.1	45.5
	ME/QE	1	9.1	9.1	54.5
	Product Development Engineer	2	18.2	18.2	72.7
	Program engineer	1	9.1	9.1	81.8
	Project Engineer	1	9.1	9.1	90.9
	Student	1	9.1	9.1	100.0
	Total	11	100.0	100.0	

q23 Employer/Company name

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		2	18.2	18.2	18.2
	Camp Blodgett	1	9.1	9.1	27.3
	Ferris State University	1	9.1	9.1	36.4
	General Dynamics Land Systems - Sterling Heights Complex	1	9.1	9.1	45.5
	Haworth	1	9.1	9.1	54.5
	Magna International / Decoma International	1	9.1	9.1	63.6
	SSW Holding Company, Inc.	1	9.1	9.1	72.7
	Synthes Spine	1	9.1	9.1	81.8
	Terex Simplicity	1	9.1	9.1	90.9
	Wolverine Power Cooperative	1	9.1	9.1	100.0
	Total	11	100.0	100.0	

q24 Employer/Company mailing address

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		5	45.5	45.5	45.5
	10125 Watergate Rd, Cadillac MI 49601	1	9.1	9.1	54.5
	1302 Wrights land EastWest Chester, PA 19335	1	9.1	9.1	63.6
	1545 Buchanan Ave Grand Rapids, MI 49507	1	9.1	9.1	72.7
	902 N. Rowe St. Ludington, MI 49431	1	9.1	9.1	81.8
	Decoma International 600 Wilshire Drive. Troy, MI 48084	1	9.1	9.1	90.9
	Durand, MI	1	9.1	9.1	100.0
	Total	11	100.0	100.0	

Instruments were prepared and sent to program alumni from the last 10 years, in both electronic and paper formats by Institutional Research & Testing. The electronic database did not produce many respondents, and a mailing followed. Still not many respondents, thus all alumni still attending BS programs on campus were identified, and they each received an instrument. The data sample is from a disappointingly number of eleven.

Data is varied and mixed while some questions are unanimous.

Of note to the Question: "Based on your experience and knowledge of the profession, to what extent did the course knowledge in the following areas prepare you for employment?" The CAD Fundamentals course received a unanimous "Strongly Agree". The courses of: Interpreting Engineering Drawings, CAD Tool Detailing, and CAD Solid Modeling were rated 91% (10/11) "Strongly Agree". The rest of the CDTD Major classes had a simple majority for "Strongly Agree" or greater. Of the Technical related courses respondents generally agreed that the course prepared them for employment. The General Education courses had the greatest range of responses. Respondents indicated that they disagreed strongly and somewhat disagreed that the courses prepared them for employment. The numbers do not however correspond to the q2b Question "Gaining a broad General education"

Respondents indicated varied positive comments to the open questions (Including the "what was least valuable coursework" question. Please refer to the actual responses. The questions relating to the Facilities were positive in nature, and the trends question referred to already implemented concepts or approaches.

Product Design continues to be a major area for our graduates to pursue a BS degree. Note that graduates did NOT get a BS from any other institution.

Employed graduates, are employed at typical industries, with their salaries ranging from Approximately $30,000 - $80,000.

08 CDTD APR...Industry

Frequencies

Prepared by: Institutional Research & Testing, 03/09

Statistics

	N		Mean	Median	Std. Deviation
	Valid	Missing	Valid	Missing	Valid
q1 Number of employees	12	1	2.33	2.50	.985
q2 Primary manufacturing process	12	1	2.58	2.00	1.505
q2a Primary Other specified	13	0			
q3 Build tools	12	1	2.83	3.00	1.267
q4 Number of tool designers/detailers employed	13	0			
q5 % tools design in-house	13	0			
q6 % tools outside design	13	0			
q7 Software	12	1	3.33	3.50	1.670
q7a Software Other specified	13	0			
q8 % designs in 2D CAD	13	0			
q9 % designs in Parametric Solids	13	0			
q10 How impt hiree understand software	12	1	2.17	2.00	.718
q11 2-yr Assoc deg tool designer salary	11	2	2.82	3.00	.751
q12 % design work outside USA	13	0			
q13a Tools: Injection molds	12	1	.17	.00	.389
q13b Tools: Compression molds	12	1	.00	.00	.000
q13c Tools: Blow molds	12	1	.00	.00	.000
q13d Tools: Vacuum forming	12	1	.08	.00	.289
q13e Tools: Extrusions	12	1	.00	.00	.000
q13f Tools: Special machines	12	1	.42	.00	.515
q13g Tools: Gages	12	1	.83	1.00	.389
q13h Tools: Progressive dies	12	1	.58	1.00	.515
q13i Tools: Draw dies	12	1	.33	.00	.492
q13j Tools: Compound dies	12	1	.33	.00	.492
q13k Tools: Transfer dies	12	1	.42	.00	.515
q13l Tools: Fixtures	12	1	.75	1.00	.452
q13m Tools: Multi slides/4 slide	12	1	.08	.00	.289
q13n Tools: Die casting	12	1	.08	.00	.289
q13o Tools: Other tools	12	1	.33	.00	.492
q13p Tools: Casting processes	12	1	.08	.00	.289
q13q Tools: Other Casting processes specified	13	0			
q14a Fundamentals of Drafting	12	1	3.75	4.00	.622
q14b Sketching	12	1	3.17	3.00	.718
q14c Introduction to CAD	12	1	3.58	4.00	.515
q14d Descriptive Geometry	12	1	3.17	3.00	.577
q14e Product/Tool Detailing	12	1	3.67	4.00	.492
q14f Computer Aided Drafting	12	1	3.83	4.00	.389

q14g Solid Modeling w/ Parametrics	*12*	*1*	*3.50*	*4.00*	*.905*
q14h Tool Design	*12*	*1*	*3.67*	*4.00*	*.492*
q14i Die Design	*7*	*6*	*4.00*	*4.00*	*.000*
q14j Mold Design	*2*	*11*	*2.50*	*2.50*	*2.121*
q14k Basic Machine Tools	*12*	*1*	*3.33*	*3.50*	*.778*
q14l Advanced Machine Tools w/ CAM	*12*	*1*	*2.83*	*3.00*	*.835*
q14m Physics	*12*	*1*	*2.67*	*3.00*	*.778*
q14n Math w/ Trig	*12*	*1*	*3.42*	*3.00*	*.515*
q14o Introduction to Materials	*12*	*1*	*3.33*	*3.00*	*.492*
q14p Dimensioning & Tolerancing	*12*	*1*	*3.75*	*4.00*	*.452*
q14q GD & T	*12*	*1*	*3.58*	*4.00*	*.669*
q14r Product Assemblies & Detailing	*12*	*1*	*3.08*	*3.00*	*.793*
q14s Moldflow	*9*	*4*	*1.56*	*1.00*	*.726*
q14t CAE	*10*	*3*	*2.50*	*3.00*	*.707*
q15a Board drafting/Sketching	*11*	*2*	*2.91*	*3.00*	*.944*
q15b Descriptive Geometry	*11*	*2*	*3.18*	*3.00*	*.603*
q15c CAD 2-D	*10*	*3*	*3.50*	*4.00*	*.707*
q15d CAD 3-D modeling	*11*	*2*	*3.64*	*4.00*	*.505*
q15e CAD surfacing/solid modeling	*11*	*2*	*3.36*	*3.00*	*.505*
q15f Solid modeling-parametrics	*11*	*2*	*3.55*	*4.00*	*.522*
q15g Dimensioning, tolerancing & GD&T	*11*	*2*	*3.73*	*4.00*	*.647*
q15h Product design/detailing	*11*	*2*	*3.27*	*3.00*	*.786*
q15i Gage design	*11*	*2*	*2.73*	*3.00*	*.647*
q15j Jig & fixture design	*11*	*2*	*3.09*	*3.00*	*.944*
q15k Die design	*5*	*8*	*3.80*	*4.00*	*.447*
q15l Mold design	*3*	*10*	*2.67*	*3.00*	*1.528*
q15m Special machine design	*11*	*2*	*2.27*	*2.00*	*.786*
q15n Automation & system design	*11*	*2*	*2.27*	*2.00*	*.905*
q15o Materials & material selection	*10*	*3*	*3.30*	*3.00*	*.675*
q15p Moldflow	*1*	*12*	*3.00*	*3.00*	
q15q Sheet metal simulation	*6*	*7*	*2.67*	*3.00*	*.516*
q15r Physics	*11*	*2*	*2.82*	*3.00*	*.603*
q15s Static & strength of materials	*11*	*2*	*2.73*	*3.00*	*.786*
q15t Computer aided FEA	*11*	*2*	*2.36*	*2.00*	*.674*
q15u Kinematics	*11*	*2*	*2.36*	*2.00*	*.809*
q15v Fluids (hydraulics, pneumatics)	*11*	*2*	*2.64*	*2.00*	*.809*
q15w Rapid prototyping	*11*	*2*	*2.18*	*2.00*	*.982*
q15x Electronic sensors for tooling	*11*	*2*	*2.73*	*3.00*	*.905*
q15y Manufacturing processes	*11*	*2*	*3.27*	*3.00*	*.786*
q15z Welding & metal joining processes	*10*	*3*	*2.60*	*3.00*	*.843*
q15aa Machine tool fundamentals	*11*	*2*	*3.36*	*4.00*	*.924*
q15ab Advanced Machine Tools w/ CAM	*10*	*3*	*2.70*	*3.00*	*.675*
q15ac Die & mold construction & repair	*10*	*3*	*2.60*	*3.00*	*.966*
q15ad Quality control & SPC	*11*	*2*	*2.45*	*2.00*	*.820*
q15ae Design for manufacturing	*11*	*2*	*3.00*	*3.00*	*.775*
q15af Process planning & estimating	*11*	*2*	*3.00*	*3.00*	*.632*

q15ag Body design	10	3	2.00	2.00	.667
q15ah Metrology	11	2	2.55	3.00	.522
q15ai Internship for tool design	11	2	2.82	3.00	1.079
q15aj CIM	11	2	1.91	2.00	.701
q15ak CAD macro creating/system customization	10	3	2.10	2.00	.568
q15al Speech & English	11	2	3.09	3.00	.701
q15am Math	11	2	3.64	4.00	.505
q15an Tool tryout & processing	10	3	2.90	3.00	1.101
q15ao Computer applications	11	2	3.09	3.00	.701
q16 Satisfaction with FSU CDTD grads	4	9	4.00	4.00	.000
q17 Additional comments	13	0			

Frequency Table

q1 Number of employees

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	50 or fewer	3	23.1	25.0	25.0
	51-100	3	23.1	25.0	50.0
	101-500	5	38.5	41.7	91.7
	501 or more	1	7.7	8.3	100.0
	Total	12	92.3	100.0	
Missing	System	1	7.7		
Total		13	100.0		

q2 Primary manufacturing process

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Molded plastics	2	15.4	16.7	16.7
	Metal stamping	7	53.8	58.3	75.0
	Other	3	23.1	25.0	100.0
	Total	12	92.3	100.0	
Missing	System	1	7.7		
Total		13	100.0		

q2a Primary Other specified

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		10	76.9	76.9	76.9
	Aerospace, Composite Aircraft Design & Manufacturing	1	7.7	7.7	84.6
	Fabricator, large weldments, machining large weldments & castings	1	7.7	7.7	92.3

	Precision machining	*1*	*7.7*	*7.7*	*100.0*
	Total	*13*	*100.0*	*100.0*	

q3 Build tools

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	In-house	*2*	*15.4*	*16.7*	*16.7*
	Outside company	*4*	*30.8*	*33.3*	*50.0*
	All of the above	*6*	*46.2*	*50.0*	*100.0*
	Total	*12*	*92.3*	*100.0*	
Missing	System	*1*	*7.7*		
Total		*13*	*100.0*		

q4 Number of tool designers/detailers employed

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		*1*	*7.7*	*7.7*	*7.7*
	0	*3*	*23.1*	*23.1*	*30.8*
	28	*1*	*7.7*	*7.7*	*38.5*
	4	*2*	*15.4*	*15.4*	*53.8*
	5	*3*	*23.1*	*23.1*	*76.9*
	6	*2*	*15.4*	*15.4*	*92.3*
	None	*1*	*7.7*	*7.7*	*100.0*
	Total	*13*	*100.0*	*100.0*	

q5 % tools design in-house

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		*1*	*7.7*	*7.7*	*7.7*
	0	*2*	*15.4*	*15.4*	*23.1*
	100	*1*	*7.7*	*7.7*	*30.8*
	2	*1*	*7.7*	*7.7*	*38.5*
	50%	*1*	*7.7*	*7.7*	*46.2*
	60	*2*	*15.4*	*15.4*	*61.5*
	75	*1*	*7.7*	*7.7*	*69.2*
	80	*1*	*7.7*	*7.7*	*76.9*
	90	*1*	*7.7*	*7.7*	*84.6*
	95	*2*	*15.4*	*15.4*	*100.0*
	Total	*13*	*100.0*	*100.0*	

q6 % tools outside design

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	7.7	7.7	7.7
	0	1	7.7	7.7	15.4
	10	1	7.7	7.7	23.1
	100	2	15.4	15.4	38.5
	20	1	7.7	7.7	46.2
	25	1	7.7	7.7	53.8
	40	2	15.4	15.4	69.2
	5	2	15.4	15.4	84.6
	50%	1	7.7	7.7	92.3
	98	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

q7 Software

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PROE	2	15.4	16.7	16.7
	UG	3	23.1	25.0	41.7
	CAT/A	1	7.7	8.3	50.0
	Solidworks	1	7.7	8.3	58.3
	Other	5	38.5	41.7	100.0
	Total	12	92.3	100.0	
Missing	System	1	7.7		
Total		13	100.0		

q7a Software Other specified

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		8	61.5	61.5	61.5
	Auto Cad/ Inventor	1	7.7	7.7	69.2
	Autocad	1	7.7	7.7	76.9
	CAD / Inventor	1	7.7	7.7	84.6
	NA	1	7.7	7.7	92.3
	UG, Catia, - For part design only	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

q8 % designs in 2D CAD

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	7.7	7.7	7.7
	0	5	38.5	38.5	46.2
	0%	1	7.7	7.7	53.8
	10	2	15.4	15.4	69.2
	50	2	15.4	15.4	84.6
	90	1	7.7	7.7	92.3
	NA	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

q9 % designs in Parametric Solids

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	7.7	7.7	7.7
	10	1	7.7	7.7	15.4
	100	5	38.5	38.5	53.8
	100%	1	7.7	7.7	61.5
	50	2	15.4	15.4	76.9
	90	2	15.4	15.4	92.3
	NA	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

q10 How impt hire understand software

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not important if they understand CAD	2	15.4	16.7	16.7
	Somewhat Important	6	46.2	50.0	66.7
	Very Important	4	30.8	33.3	100.0
	Total	12	92.3	100.0	
Missing	System	1	7.7		
Total		13	100.0		

q11 2-yr Assoc deg tool designer salary

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	$30,00-$34,999	4	30.8	36.4	36.4
	$35,000-$39,999	5	38.5	45.5	81.8
	$40,000-$44,999	2	15.4	18.2	100.0

	Total	*11*	*84.6*	*100.0*	
Missing	System	*2*	*15.4*		
Total		*13*	*100.0*		

q12 % design work outside USA

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		*1*	*7.7*	*7.7*	*7.7*
	0	*6*	*46.2*	*46.2*	*53.8*
	1	*1*	*7.7*	*7.7*	*61.5*
	1%	*1*	*7.7*	*7.7*	*69.2*
	2	*1*	*7.7*	*7.7*	*76.9*
	2%	*1*	*7.7*	*7.7*	*84.6*
	25	*1*	*7.7*	*7.7*	*92.3*
	5	*1*	*7.7*	*7.7*	*100.0*
	Total	*13*	*100.0*	*100.0*	

q13a Tools: Injection molds

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	*10*	*76.9*	*83.3*	*83.3*
	Selected	*2*	*15.4*	*16.7*	*100.0*
	Total	*12*	*92.3*	*100.0*	
Missing	System	*1*	*7.7*		
Total		*13*	*100.0*		

q13b Tools: Compression molds

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	*12*	*92.3*	*100.0*	*100.0*
Missing	System	*1*	*7.7*		
Total		*13*	*100.0*		

q13c Tools: Blow molds

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	*12*	*92.3*	*100.0*	*100.0*
Missing	System	*1*	*7.7*		
Total		*13*	*100.0*		

q13d Tools: Vacuum forming

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	11	84.6	91.7	91.7
	Selected	1	7.7	8.3	100.0
	Total	12	92.3	100.0	
Missing	System	1	7.7		
Total		13	100.0		

q13e Tools: Extrusions

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	12	92.3	100.0	100.0
Missing	System	1	7.7		
Total		13	100.0		

q13f Tools: Special machines

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	7	53.8	58.3	58.3
	Selected	5	38.5	41.7	100.0
	Total	12	92.3	100.0	
Missing	System	1	7.7		
Total		13	100.0		

q13g Tools: Gages

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	2	15.4	16.7	16.7
	Selected	10	76.9	83.3	100.0
	Total	12	92.3	100.0	
Missing	System	1	7.7		
Total		13	100.0		

q13h Tools: Progressive dies

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	5	38.5	41.7	41.7

	Selected	*7*	*53.8*	*58.3*	*100.0*
	Total	*12*	*92.3*	*100.0*	
Missing	System	*1*	*7.7*		
Total		*13*	*100.0*		

q13i Tools: Draw dies

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	*8*	*61.5*	*66.7*	*66.7*
	Selected	*4*	*30.8*	*33.3*	*100.0*
	Total	*12*	*92.3*	*100.0*	
Missing	System	*1*	*7.7*		
Total		*13*	*100.0*		

q13j Tools: Compound dies

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	*8*	*61.5*	*66.7*	*66.7*
	Selected	*4*	*30.8*	*33.3*	*100.0*
	Total	*12*	*92.3*	*100.0*	
Missing	System	*1*	*7.7*		
Total		*13*	*100.0*		

q13k Tools: Transfer dies

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	*7*	*53.8*	*58.3*	*58.3*
	Selected	*5*	*38.5*	*41.7*	*100.0*
	Total	*12*	*92.3*	*100.0*	
Missing	System	*1*	*7.7*		
Total		*13*	*100.0*		

q13l Tools: Fixtures

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	*3*	*23.1*	*25.0*	*25.0*
	Selected	*9*	*69.2*	*75.0*	*100.0*
	Total	*12*	*92.3*	*100.0*	
Missing	System	*1*	*7.7*		
Total		*13*	*100.0*		

q13m Tools: Multi slides/4 slide

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	*11*	*84.6*	*91.7*	*91.7*
	Selected	*1*	*7.7*	*8.3*	*100.0*
	Total	*12*	*92.3*	*100.0*	
Missing	System	*1*	*7.7*		
Total		*13*	*100.0*		

q13n Tools: Die casting

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	*11*	*84.6*	*91.7*	*91.7*
	Selected	*1*	*7.7*	*8.3*	*100.0*
	Total	*12*	*92.3*	*100.0*	
Missing	System	*1*	*7.7*		
Total		*13*	*100.0*		

q13o Tools: Other tools

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	*8*	*61.5*	*66.7*	*66.7*
	Selected	*4*	*30.8*	*33.3*	*100.0*
	Total	*12*	*92.3*	*100.0*	
Missing	System	*1*	*7.7*		
Total		*13*	*100.0*		

q13p Tools: Casting processes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	*11*	*84.6*	*91.7*	*91.7*
	Selected	*1*	*7.7*	*8.3*	*100.0*
	Total	*12*	*92.3*	*100.0*	
Missing	System	*1*	*7.7*		
Total		*13*	*100.0*		

q13q Tools: Other Casting processes specified

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		9	69.2	69.2	69.2
	Composite Layup Tools	1	7.7	7.7	76.9
	Cutting tools	1	7.7	7.7	84.6
	Foam encapsulation molds	1	7.7	7.7	92.3
	Machining tools	1	7.7	7.7	100.0
	Total	13	100.0	100.0	

q14a Fundamentals of Drafting

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Unimportant	1	7.7	8.3	8.3
	Somewhat Important	1	7.7	8.3	16.7
	Very Important	10	76.9	83.3	100.0
	Total	12	92.3	100.0	
Missing	System	1	7.7		
Total		13	100.0		

q14b Sketching

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Unimportant	2	15.4	16.7	16.7
	Somewhat Important	6	46.2	50.0	66.7
	Very Important	4	30.8	33.3	100.0
	Total	12	92.3	100.0	
Missing	System	1	7.7		
Total		13	100.0		

q14c Introduction to CAD

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Important	5	38.5	41.7	41.7
	Very Important	7	53.8	58.3	100.0
	Total	12	92.3	100.0	
Missing	System	1	7.7		
Total		13	100.0		

q14d Descriptive Geometry

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Unimportant	1	7.7	8.3	8.3
	Somewhat Important	8	61.5	66.7	75.0
	Very Important	3	23.1	25.0	100.0
	Total	12	92.3	100.0	
Missing	System	1	7.7		
Total		13	100.0		

q14e Product/Tool Detailing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Important	4	30.8	33.3	33.3
	Very Important	8	61.5	66.7	100.0
	Total	12	92.3	100.0	
Missing	System	1	7.7		
Total		13	100.0		

q14f Computer Aided Drafting

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Important	2	15.4	16.7	16.7
	Very Important	10	76.9	83.3	100.0
	Total	12	92.3	100.0	
Missing	System	1	7.7		
Total		13	100.0		

q14g Solid Modeling w/ Parametrics

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unimportant	1	7.7	8.3	8.3
	Somewhat Important	3	23.1	25.0	33.3
	Very Important	8	61.5	66.7	100.0
	Total	12	92.3	100.0	
Missing	System	1	7.7		
Total		13	100.0		

q14h Tool Design

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Important	4	30.8	33.3	33.3
	Very Important	8	61.5	66.7	100.0
	Total	12	92.3	100.0	
Missing	System	1	7.7		
Total		13	100.0		

q14i Die Design

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Important	7	53.8	100.0	100.0
Missing	System	6	46.2		
Total		13	100.0		

q14j Mold Design

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unimportant	1	7.7	50.0	50.0
	Very Important	1	7.7	50.0	100.0
	Total	2	15.4	100.0	
Missing	System	11	84.6		
Total		13	100.0		

q14k Basic Machine Tools

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Unimportant	2	15.4	16.7	16.7
	Somewhat Important	4	30.8	33.3	50.0
	Very Important	6	46.2	50.0	100.0
	Total	12	92.3	100.0	
Missing	System	1	7.7		
Total		13	100.0		

q14l Advanced Machine Tools w/ CAM

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unimportant	1	7.7	8.3	8.3

	Somewhat Unimportant	2	15.4	16.7	25.0
	Somewhat Important	7	53.8	58.3	83.3
	Very Important	2	15.4	16.7	100.0
	Total	12	92.3	100.0	
Missing	System	1	7.7		
Total		13	100.0		

q14m Physics

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unimportant	1	7.7	8.3	8.3
	Somewhat Unimportant	3	23.1	25.0	33.3
	Somewhat Important	7	53.8	58.3	91.7
	Very Important	1	7.7	8.3	100.0
	Total	12	92.3	100.0	
Missing	System	1	7.7		
Total		13	100.0		

q14n Math w/ Trig

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Important	7	53.8	58.3	58.3
	Very Important	5	38.5	41.7	100.0
	Total	12	92.3	100.0	
Missing	System	1	7.7		
Total		13	100.0		

q14o Introduction to Materials

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Important	8	61.5	66.7	66.7
	Very Important	4	30.8	33.3	100.0
	Total	12	92.3	100.0	
Missing	System	1	7.7		
Total		13	100.0		

q14p Dimensioning &Tolerancing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Important	3	23.1	25.0	25.0

	Very Important	*9*	*69.2*	*75.0*	*100.0*
	Total	*12*	*92.3*	*100.0*	
Missing	System	*1*	*7.7*		
Total		*13*	*100.0*		

q14q GD & T

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Unimportant	*1*	*7.7*	*8.3*	*8.3*
	Somewhat Important	*3*	*23.1*	*25.0*	*33.3*
	Very Important	*8*	*61.5*	*66.7*	*100.0*
	Total	*12*	*92.3*	*100.0*	
Missing	System	*1*	*7.7*		
Total		*13*	*100.0*		

q14r Product Assemblies & Detailing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Unimportant	*3*	*23.1*	*25.0*	*25.0*
	Somewhat Important	*5*	*38.5*	*41.7*	*66.7*
	Very Important	*4*	*30.8*	*33.3*	*100.0*
	Total	*12*	*92.3*	*100.0*	
Missing	System	*1*	*7.7*		
Total		*13*	*100.0*		

q14s Moldflow

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unimportant	*5*	*38.5*	*55.6*	*55.6*
	Somewhat Unimportant	*3*	*23.1*	*33.3*	*88.9*
	Somewhat Important	*1*	*7.7*	*11.1*	*100.0*
	Total	*9*	*69.2*	*100.0*	
Missing	System	*4*	*30.8*		
Total		*13*	*100.0*		

q14t CAE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unimportant	*1*	*7.7*	*10.0*	*10.0*
	Somewhat Unimportant	*3*	*23.1*	*30.0*	*40.0*

	Somewhat Important	6	46.2	60.0	100.0
	Total	10	76.9	100.0	
Missing	System	3	23.1		
Total		13	100.0		

q15a Board drafting/Sketching

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unimportant	1	7.7	9.1	9.1
	Somewhat Unimportant	2	15.4	18.2	27.3
	Somewhat Important	5	38.5	45.5	72.7
	Very Important	3	23.1	27.3	100.0
	Total	11	84.6	100.0	
Missing	System	2	15.4		
Total		13	100.0		

q15b Descriptive Geometry

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Unimportant	1	7.7	9.1	9.1
	Somewhat Important	7	53.8	63.6	72.7
	Very Important	3	23.1	27.3	100.0
	Total	11	84.6	100.0	
Missing	System	2	15.4		
Total		13	100.0		

q15c CAD 2-D

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Unimportant	1	7.7	10.0	10.0
	Somewhat Important	3	23.1	30.0	40.0
	Very Important	6	46.2	60.0	100.0
	Total	10	76.9	100.0	
Missing	System	3	23.1		
Total		13	100.0		

q15d CAD 3-D modeling

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Important	4	30.8	36.4	36.4

	Very Important	7	53.8	63.6	100.0
	Total	11	84.6	100.0	
Missing	System	2	15.4		
Total		13	100.0		

q15e CAD surfacing/solid modeling

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Important	7	53.8	63.6	63.6
	Very Important	4	30.8	36.4	100.0
	Total	11	84.6	100.0	
Missing	System	2	15.4		
Total		13	100.0		

q15f Solid modeling-parametrics

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Important	5	38.5	45.5	45.5
	Very Important	6	46.2	54.5	100.0
	Total	11	84.6	100.0	
Missing	System	2	15.4		
Total		13	100.0		

q15g Dimensioning, tolerancing & GD&T

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Unimportant	1	7.7	9.1	9.1
	Somewhat Important	1	7.7	9.1	18.2
	Very Important	9	69.2	81.8	100.0
	Total	11	84.6	100.0	
Missing	System	2	15.4		
Total		13	100.0		

q15h Product design/detailing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Unimportant	2	15.4	18.2	18.2
	Somewhat Important	4	30.8	36.4	54.5
	Very Important	5	38.5	45.5	100.0
	Total	11	84.6	100.0	

Missing	System	2	15.4		
Total		13	100.0		

q15i Gage design

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Unimportant	4	30.8	36.4	36.4
	Somewhat Important	6	46.2	54.5	90.9
	Very Important	1	7.7	9.1	100.0
	Total	11	84.6	100.0	
Missing	System	2	15.4		
Total		13	100.0		

q15j Jig & fixture design

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Unimportant	4	30.8	36.4	36.4
	Somewhat Important	2	15.4	18.2	54.5
	Very Important	5	38.5	45.5	100.0
	Total	11	84.6	100.0	
Missing	System	2	15.4		
Total		13	100.0		

q15k Die design

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Important	1	7.7	20.0	20.0
	Very Important	4	30.8	80.0	100.0
	Total	5	38.5	100.0	
Missing	System	8	61.5		
Total		13	100.0		

q15l Mold design

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unimportant	1	7.7	33.3	33.3
	Somewhat Important	1	7.7	33.3	66.7
	Very Important	1	7.7	33.3	100.0
	Total	3	23.1	100.0	
Missing	System	10	76.9		

Total		*13*	*100.0*		

q15m Special machine design

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unimportant	*2*	*15.4*	*18.2*	*18.2*
	Somewhat Unimportant	*4*	*30.8*	*36.4*	*54.5*
	Somewhat Important	*5*	*38.5*	*45.5*	*100.0*
	Total	*11*	*84.6*	*100.0*	
Missing	System	*2*	*15.4*		
Total		*13*	*100.0*		

q15n Automation & system design

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unimportant	*2*	*15.4*	*18.2*	*18.2*
	Somewhat Unimportant	*5*	*38.5*	*45.5*	*63.6*
	Somewhat Important	*3*	*23.1*	*27.3*	*90.9*
	Very Important	*1*	*7.7*	*9.1*	*100.0*
	Total	*11*	*84.6*	*100.0*	
Missing	System	*2*	*15.4*		
Total		*13*	*100.0*		

q15o Materials & material selection

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Unimportant	*1*	*7.7*	*10.0*	*10.0*
	Somewhat Important	*5*	*38.5*	*50.0*	*60.0*
	Very Important	*4*	*30.8*	*40.0*	*100.0*
	Total	*10*	*76.9*	*100.0*	
Missing	System	*3*	*23.1*		
Total		*13*	*100.0*		

q15p Moldflow

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Important	*1*	*7.7*	*100.0*	*100.0*
Missing	System	*12*	*92.3*		
Total		*13*	*100.0*		

q15q Sheet metal simulation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Unimportant	2	15.4	33.3	33.3
	Somewhat Important	4	30.8	66.7	100.0
	Total	6	46.2	100.0	
Missing	System	7	53.8		
Total		13	100.0		

q15r Physics

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Unimportant	3	23.1	27.3	27.3
	Somewhat Important	7	53.8	63.6	90.9
	Very Important	1	7.7	9.1	100.0
	Total	11	84.6	100.0	
Missing	System	2	15.4		
Total		13	100.0		

q15s Static & strength of materials

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Unimportant	5	38.5	45.5	45.5
	Somewhat Important	4	30.8	36.4	81.8
	Very Important	2	15.4	18.2	100.0
	Total	11	84.6	100.0	
Missing	System	2	15.4		
Total		13	100.0		

q15t Computer aided FEA

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unimportant	1	7.7	9.1	9.1
	Somewhat Unimportant	5	38.5	45.5	54.5
	Somewhat Important	5	38.5	45.5	100.0
	Total	11	84.6	100.0	
Missing	System	2	15.4		
Total		13	100.0		

q15u Kinematics

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unimportant	1	7.7	9.1	9.1
	Somewhat Unimportant	6	46.2	54.5	63.6
	Somewhat Important	3	23.1	27.3	90.9
	Very Important	1	7.7	9.1	100.0
	Total	11	84.6	100.0	
Missing	System	2	15.4		
Total		13	100.0		

q15v Fluids (hydraulics, pneumatics)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Unimportant	6	46.2	54.5	54.5
	Somewhat Important	3	23.1	27.3	81.8
	Very Important	2	15.4	18.2	100.0
	Total	11	84.6	100.0	
Missing	System	2	15.4		
Total		13	100.0		

q15w Rapid prototyping

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unimportant	3	23.1	27.3	27.3
	Somewhat Unimportant	4	30.8	36.4	63.6
	Somewhat Important	3	23.1	27.3	90.9
	Very Important	1	7.7	9.1	100.0
	Total	11	84.6	100.0	
Missing	System	2	15.4		
Total		13	100.0		

q15x Electronic sensors for tooling

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unimportant	1	7.7	9.1	9.1
	Somewhat Unimportant	3	23.1	27.3	36.4
	Somewhat Important	5	38.5	45.5	81.8
	Very Important	2	15.4	18.2	100.0
	Total	11	84.6	100.0	

Missing	System	*2*	*15.4*		
Total		*13*	*100.0*		

q15y Manufacturing processes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Unimportant	*2*	*15.4*	*18.2*	*18.2*
	Somewhat Important	*4*	*30.8*	*36.4*	*54.5*
	Very Important	*5*	*38.5*	*45.5*	*100.0*
	Total	*11*	*84.6*	*100.0*	
Missing	System	*2*	*15.4*		
Total		*13*	*100.0*		

q15z Welding & metal joining processes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unimportant	*1*	*7.7*	*10.0*	*10.0*
	Somewhat Unimportant	*3*	*23.1*	*30.0*	*40.0*
	Somewhat Important	*5*	*38.5*	*50.0*	*90.0*
	Very Important	*1*	*7.7*	*10.0*	*100.0*
	Total	*10*	*76.9*	*100.0*	
Missing	System	*3*	*23.1*		
Total		*13*	*100.0*		

q15aa Machine tool fundamentals

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unimportant	*1*	*7.7*	*9.1*	*9.1*
	Somewhat Important	*4*	*30.8*	*36.4*	*45.5*
	Very Important	*6*	*46.2*	*54.5*	*100.0*
	Total	*11*	*84.6*	*100.0*	
Missing	System	*2*	*15.4*		
Total		*13*	*100.0*		

q15ab Advanced Machine Tools w/ CAM

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unimportant	*1*	*7.7*	*10.0*	*10.0*
	Somewhat Unimportant	*1*	*7.7*	*10.0*	*20.0*
	Somewhat Important	*8*	*61.5*	*80.0*	*100.0*

	Total	*10*	*76.9*	*100.0*	
Missing	System	*3*	*23.1*		
Total		*13*	*100.0*		

q15ac Die & mold construction & repair

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unimportant	*2*	*15.4*	*20.0*	*20.0*
	Somewhat Unimportant	*1*	*7.7*	*10.0*	*30.0*
	Somewhat Important	*6*	*46.2*	*60.0*	*90.0*
	Very Important	*1*	*7.7*	*10.0*	*100.0*
	Total	*10*	*76.9*	*100.0*	
Missing	System	*3*	*23.1*		
Total		*13*	*100.0*		

q15ad Quality control & SPC

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unimportant	*1*	*7.7*	*9.1*	*9.1*
	Somewhat Unimportant	*5*	*38.5*	*45.5*	*54.5*
	Somewhat Important	*4*	*30.8*	*36.4*	*90.9*
	Very Important	*1*	*7.7*	*9.1*	*100.0*
	Total	*11*	*84.6*	*100.0*	
Missing	System	*2*	*15.4*		
Total		*13*	*100.0*		

q15ae Design for manufacturing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Unimportant	*3*	*23.1*	*27.3*	*27.3*
	Somewhat Important	*5*	*38.5*	*45.5*	*72.7*
	Very Important	*3*	*23.1*	*27.3*	*100.0*
	Total	*11*	*84.6*	*100.0*	
Missing	System	*2*	*15.4*		
Total		*13*	*100.0*		

q15af Process planning & estimating

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Unimportant	*2*	*15.4*	*18.2*	*18.2*

	Somewhat Important	7	53.8	63.6	81.8
	Very Important	2	15.4	18.2	100.0
	Total	11	84.6	100.0	
Missing	System	2	15.4		
Total		13	100.0		

q15ag Body design

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unimportant	2	15.4	20.0	20.0
	Somewhat Unimportant	6	46.2	60.0	80.0
	Somewhat Important	2	15.4	20.0	100.0
	Total	10	76.9	100.0	
Missing	System	3	23.1		
Total		13	100.0		

q15ah Metrology

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Unimportant	5	38.5	45.5	45.5
	Somewhat Important	6	46.2	54.5	100.0
	Total	11	84.6	100.0	
Missing	System	2	15.4		
Total		13	100.0		

q15ai Internship for tool design

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unimportant	2	15.4	18.2	18.2
	Somewhat Unimportant	1	7.7	9.1	27.3
	Somewhat Important	5	38.5	45.5	72.7
	Very Important	3	23.1	27.3	100.0
	Total	11	84.6	100.0	
Missing	System	2	15.4		
Total		13	100.0		

q15aj CIM

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unimportant	3	23.1	27.3	27.3

	Somewhat Unimportant	6	46.2	54.5	81.8
	Somewhat Important	2	15.4	18.2	100.0
	Total	11	84.6	100.0	
Missing	System	2	15.4		
Total		13	100.0		

q15ak CAD macro creating/system customization

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unimportant	1	7.7	10.0	10.0
	Somewhat Unimportant	7	53.8	70.0	80.0
	Somewhat Important	2	15.4	20.0	100.0
	Total	10	76.9	100.0	
Missing	System	3	23.1		
Total		13	100.0		

q15al Speech & English

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Unimportant	2	15.4	18.2	18.2
	Somewhat Important	6	46.2	54.5	72.7
	Very Important	3	23.1	27.3	100.0
	Total	11	84.6	100.0	
Missing	System	2	15.4		
Total		13	100.0		

q15am Math

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Important	4	30.8	36.4	36.4
	Very Important	7	53.8	63.6	100.0
	Total	11	84.6	100.0	
Missing	System	2	15.4		
Total		13	100.0		

q15an Tool tryout & processing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unimportant	1	7.7	10.0	10.0
	Somewhat Unimportant	3	23.1	30.0	40.0

	Somewhat Important	*2*	*15.4*	*20.0*	*60.0*
	Very Important	*4*	*30.8*	*40.0*	*100.0*
	Total	*10*	*76.9*	*100.0*	
Missing	System	*3*	*23.1*		
Total		*13*	*100.0*		

q15ao Computer applications

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Unimportant	*2*	*15.4*	*18.2*	*18.2*
	Somewhat Important	*6*	*46.2*	*54.5*	*72.7*
	Very Important	*3*	*23.1*	*27.3*	*100.0*
	Total	*11*	*84.6*	*100.0*	
Missing	System	*2*	*15.4*		
Total		*13*	*100.0*		

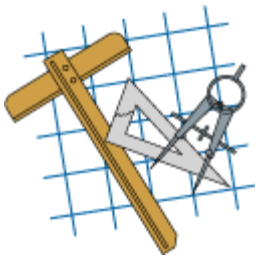
q16 Satisfaction with FSU CDTD grads

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Satisfied	*4*	*30.8*	*100.0*	*100.0*
Missing	System	*9*	*69.2*		
Total		*13*	*100.0*		

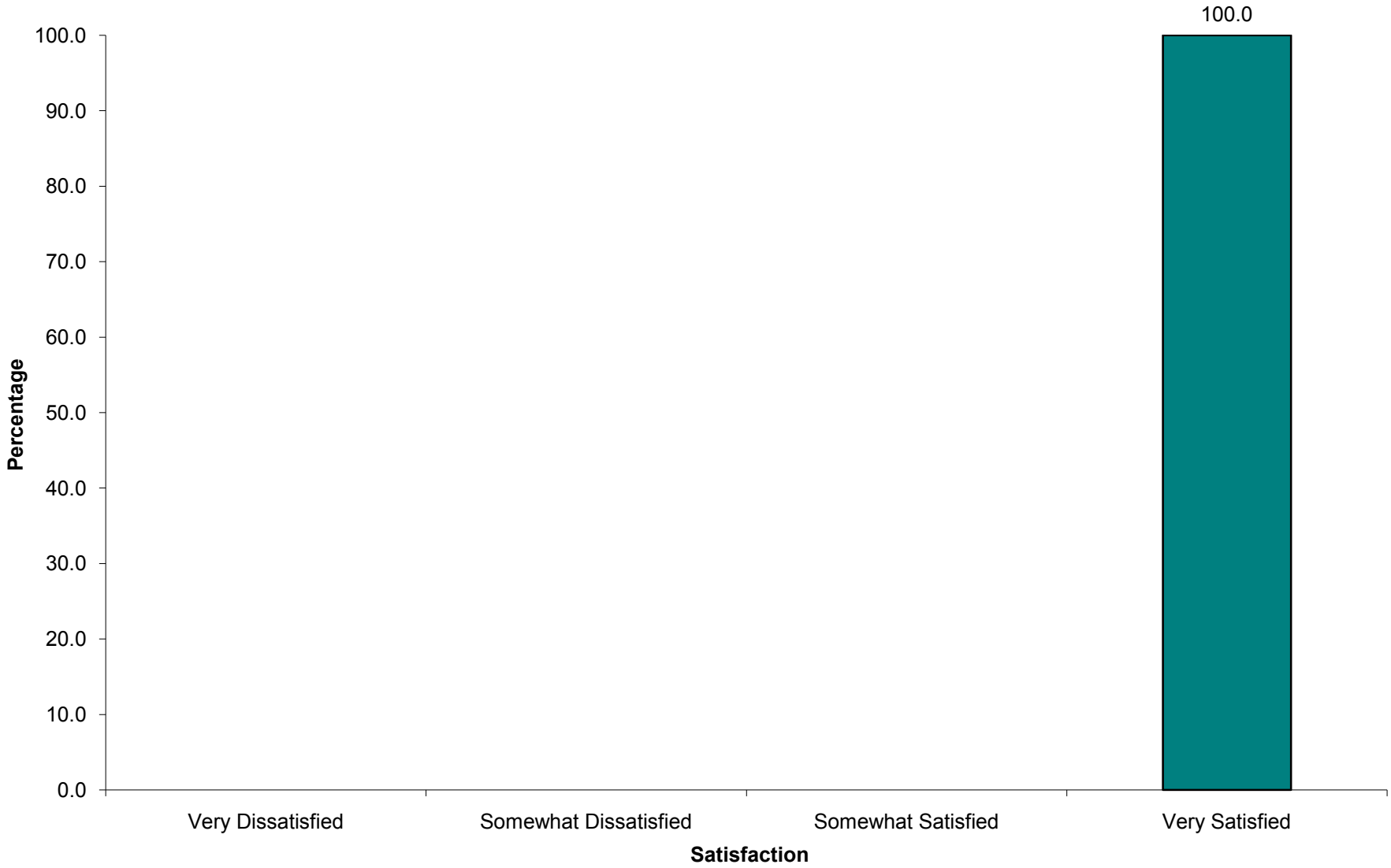
q17 Additional comments

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		*8*	*61.5*	*61.5*	*61.5*
	CDTD needs more of Hill, and less of Wanink, Rose is OK for his age, Where did Eldridge go?	*1*	*7.7*	*7.7*	*69.2*
	I think it is very beneficial for students to get some hands on experience working with the dies/tools that they will be designing. I believe to be a good designer the student must understand all aspects of the working die or tool in order to have a successful design. This includes having a materials background to select the correct materials used. Also the designer must have an understanding of how the die or tool will be maintained by the end user. There are many aspects to designing a good die or tool and the fundamentals is where it all begins.	*1*	*7.7*	*7.7*	*76.9*
	Implement some form of tolerance analysis to facilitate 2-D drawings, 3-D models and the 3-D assemblies. This pulls all together virtually to prove the designs & check the drawing to the model to the assembly.	*1*	*7.7*	*7.7*	*84.6*
	Keep up the good work	*1*	*7.7*	*7.7*	*92.3*

	We did not answer Q15 because we have never done die design/build and therefore don't know the skill requirements necessary.	*1*	*7.7*	*7.7*	*100.0*
	Total	*13*	*100.0*	*100.0*	

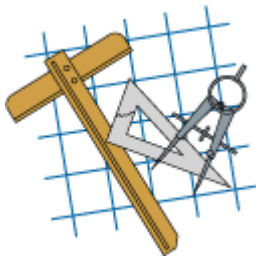


2.B. EMPLOYER FOLLOW-UP SURVEY: This activity is intended to aid in assessing the employers experiences with graduates and their perceptions of the program itself.


Q16 Satisfaction with FSU CDTD Grads
100.0
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Percentage
Very Dissatisfied
Somewhat Dissatisfied
Somewhat Satisfied
Very Satisfied
Satisfaction

SUMMARY:

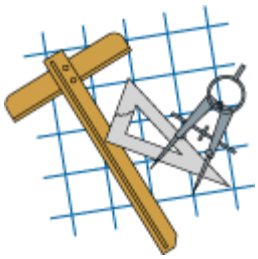
This section of the Academic Program Review Report summarizes the results of the CAD Drafting & Tool Design Employer Survey conducted January 2009. The information received by employers shows that our CAD Drafting & Tool Design graduates are providing industry with the type of skilled employee they are looking for. The survey also shows that we are providing graduates with an education that trains them to go into varied segments of engineering such as: product design, tool design, gage design, die design, mold design and machine design. *Due to the varied industries replying to the survey, some of the results are skewed toward specific processes. Care should be taken when evaluating the results and comments*. The results from employers indicate we are providing the solid design foundation companies need for highly skilled employees to design in today's sophisticated manufacturing environment. The survey was mailed to 103 employers. Approximately 37 were returned for insufficient addresses. Of the 66 remaining, 37 surveys were received for the APR analysis. This was a return rate of 20 percent.



2C. Graduating student exit survey: Graduating students are surveyed every year on an ongoing basis to obtain information regarding quality of instruction, relevance of courses, and satisfaction with program outcomes based on their own expectations. The survey must seek student suggestions on ways to improve the effectiveness of the program and to enhance the fulfillment of their expectations. This survey is mandatory for all program graduates.

Comment:

The CDTD program currently does not survey graduating students. The "Student Program Evaluation" in Section 2D surveys students for quality of instruction, relevance of courses, and satisfaction with program outcomes and expectations. In addition, students provide SAI surveys every semester.



2D. Student program evaluation: Current students are surveyed to obtain information regarding quality of instruction, relevance of courses, and satisfaction with program outcomes based on their own expectations. The survey must seek student suggestions on ways to improve the effectiveness of the program and to enhance the fulfillment of their expectations. This survey should be conducted during the year before the PRP report is submitted.

SECTION 2-D

STUDENT PROGRAM EVALUATION

A. PROGRAM TASK

Student Program Evaluation: Students are surveyed to obtain information regarding quality of instruction, relevance of courses, satisfaction with program outcomes based on their own expectations. The survey must seek student suggestions on way to improve the effectiveness of the program and to enhance the fulfillment of their expectations.

The program continually monitors the curriculum, quality of instruction and courses taught in the CDTD program. The Student Assessment Instrument provides information and evaluation of course content and instructional quality. The CDTD curriculum is assessed with the help of industry advisors and visits to industrial facilities. CDTD faculty is evaluated by students on a semester schedule, the results provided to the faculty member and dean of the college. Program faculty attends industry conferences and makes company visits to be sure curriculum is meeting industry needs. The Academic Program Review (APR) process also provides valuable input and self-evaluation of the program.

The results of the surveys have been used to identify instruction, content, equipment, facilities, courses, and marketing that are viewed as inadequate by the students. Problem areas are investigated to find the basis for the perceived problem. Changes in course texts, instructional delivery, and course content and scheduling issues have been identified and used as the basis of change.

(The survey instrument and survey results are attached.)

B. SUMMARY OF SURVEY RESULTS

Student overall ratings of the program, facilities and instruction remains high. Students place a high value with the hands on approach of instruction and feel that the lab experience of the coursework is of very high value. The students feel that CDTD faculty care about their learning and the material is relevant to there Careers. Students continually mention that the computer systems are slow and not to industry standards which causes a lot of frustration when trying to complete their required coursework. The survey respondents stated that the course work in

a few courses was too much and overwhelming. (Please reference the Advisory Committee survey and note that they indicated that all program competencies are extremely important.)

Some questions areas are difficult for the student to evaluate based on their limited experience, but student perceptions and concerns need to be considered.

FACILITIES:
The major area of concern is that the computer hardware is not adequate and up to date for the software that our students are required to use. 48% indicated that they were dissatisfied with the computer systems. The students also indicated dissatisfaction over the stability and performance of the computers in Swan 503 & 504. Many students indicated computer failures and system lockups routinely occurring while they are working on their coursework.

Another area of concern is the available lab hours. 44% felt the lab availability on weekends is below average.

INSTRUCTION:
Two areas of concern were identified by the student survey. The first concern was the amount and difficulty of course work required in a specific course. The second concern identified by students was the cost of their education.

The survey also indicated that our students need to be made more aware and encouraged to use academic, career, and counseling resources.

PROGRAM:
Students selected FSU and the CDTD program because of high school/career center instructors, quality, and reputation of the program. 80% of the students indicated they would continue on for a baccalaureate degree. The survey also indicated that we need to try to market differently by TV advertising and continuing to have program faculty visit schools. The CDTD faculty are all members of the Michigan Design Educators Association and continues to develop new relationships with career center and high school instructors in an effort to increase enrollments. We also have open houses to have instructors and students come to campus. Instructors also visit high schools and career center programs to share program information. We need to be sure to have brochures and materials that instructors can share with their students.

CDTD APR...Current Students

Frequencies

Prepared by: Institutional Research & Testing, 06/09

Statistics

	N		Mean	Median	Std. Deviation
	Valid	Missing	Valid	Missing	Valid
q1 I am in my	25	0	1.36	1.00	.490
q2a Select: Friend suggested	25	0	.08	.00	.277
q2b Select: Family suggested	25	0	.08	.00	.277
q2c Select: Teacher suggested	25	0	.52	1.00	.510
q2d Select: School counselor	25	0	.12	.00	.332
q2e Select: University Recruiter	25	0	.04	.00	.200
q2f Select: Advertising	25	0	.04	.00	.200
q2g Select: Quality and reputation	25	0	.40	.00	.500
q2h Select: Other	25	0	.28	.00	.458
q2i Select: Other specified	25	0			
q3a Promote: TV advertising	24	1	.42	.00	.504
q3b Promote: Radio advertising	24	1	.13	.00	.338
q3c Promote: Video/DVD sent to schools	24	1	.21	.00	.415
q3d Promote: Ferris website	24	1	.25	.00	.442
q3e Promote: Visits from Admissions rep	24	1	.21	.00	.415
q3f Promote: CAD Drafting faculty visits to schools	24	1	.54	1.00	.509
q3g Promote: CDTD alumni/students to visit schools	24	1	.54	1.00	.509
q3h Promote: Career center or high school on campus visit	24	1	.42	.00	.504
q3i Promote: Direct invitation to parents and students to visit the program	24	1	.21	.00	.415
q3j Promote: Brochures/materials sent to school counselors/teachers	24	1	.46	.00	.509
q3k Promote: Other	24	1	.00	.00	.000
q3l Promote: Other specified	25	0			
q4 Plan on obtaining four-year degree	25	0	1.20	1.00	.408
q5 From which program	20	5	2.85	2.00	1.981
q5a Other program specified	25	0			
q6 Percentage of time should spend on CAD	25	0	3.08	3.00	1.038
q7a Material presented in class is of adequate quality	23	2	3.13	3.00	.757
q7b Instructors are well qualified	22	3	3.27	3.00	.827
q7c Course content is being taught very well	23	2	2.78	3.00	.951
q7d Each course content is in line with my needs/interests	23	2	3.17	3.00	.937

q7e Material presented meets current standards	*23*	*2*	*3.26*	*3.00*	*.810*
q7f Pace of material presented is appropriate	*23*	*2*	*2.78*	*3.00*	*1.085*
q7g Instructors care about your learning	*23*	*2*	*3.26*	*3.00*	*.915*
q7h Material presented is relevant	*23*	*2*	*3.43*	*4.00*	*.728*
q7i Sufficient use of visual aids and materials	*23*	*2*	*3.39*	*4.00*	*.783*
q7j Material is appropriate difficulty level	*23*	*2*	*3.04*	*3.00*	*1.065*
q7k Assignment objectives are well thought out and clear	*23*	*2*	*3.09*	*3.00*	*.996*
q7l Appropriate use of media, white board, etc.	*23*	*2*	*3.35*	*3.00*	*.775*
q7m Lectures are well prepared and organized	*23*	*2*	*2.96*	*3.00*	*.928*
q7n Faculty are available for help	*23*	*2*	*3.30*	*4.00*	*.876*
q7o Faculty are approachable	*23*	*2*	*3.35*	*4.00*	*.885*
q7p My advisor has been valuable	*23*	*2*	*2.96*	*3.00*	*1.065*
q7q Materials are reviewed	*23*	*2*	*3.09*	*3.00*	*.848*
q7r Student evaluation and grading are explained and clear	*23*	*2*	*3.13*	*3.00*	*.815*
q7s Testing and evaluation procedures are fair	*23*	*2*	*3.26*	*3.00*	*.810*
q7t Graded material is returned in a timely manner	*23*	*2*	*3.26*	*3.00*	*.915*
q7u The program represents a good value for the money spent	*23*	*2*	*2.87*	*3.00*	*1.140*
q7v The lab equipment is well maintained	*23*	*2*	*2.65*	*3.00*	*1.071*
q7w The lab computers are well maintained	*23*	*2*	*2.30*	*2.00*	*1.146*
q7x I made the right choice in selecting FSU's CDTD program	*23*	*2*	*2.91*	*3.00*	*1.083*
q7y I am comfortable recommending the program to others	*23*	*2*	*2.83*	*3.00*	*1.193*
q8 Please elaborate here	*25*	*0*			
q9a CAD hardware	*25*	*0*	*2.16*	*2.00*	*1.143*
q9b CAD software	*25*	*0*	*2.92*	*3.00*	*.954*
q9c Advanced equipment	*25*	*0*	*3.24*	*3.00*	*.779*
q9d Classroom environment	*25*	*0*	*3.32*	*3.00*	*.748*
q9e Classroom furniture	*25*	*0*	*3.64*	*4.00*	*.569*
q9f Textbooks	*25*	*0*	*2.88*	*3.00*	*.781*
q9g Plotters	*25*	*0*	*3.36*	*3.00*	*.569*
q9h Printers	*25*	*0*	*3.24*	*3.00*	*.663*
q9i Faculty advising	*25*	*0*	*3.00*	*3.00*	*.866*
q9j Lab hours-evenings	*25*	*0*	*3.00*	*3.00*	*1.000*
q9k Lab hours-weekends	*25*	*0*	*2.48*	*3.00*	*1.046*
q9l Student activities and clubs	*25*	*0*	*2.68*	*3.00*	*.945*
q10 How could make CDTD better	*25*	*0*			
q11 Aware of the placement data and average starting salary	*25*	*0*			
q12 How necessary are lab experiences	*25*	*0*			
q13 How has course structure helped	*25*	*0*			
q14 How aware/have you utilized Career Services office	*25*	*0*			
q15 How aware/have you utilized Academic Support Center	*25*	*0*			
q16 How aware/have you utilized Counseling Center	*25*	*0*			
q17 How aware/have you utilized the Educ & Career Couns Ctr	*25*	*0*			
q18 Additional comments	*25*	*0*			

Frequency Table

q1 I am in my

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	First year	16	64.0	64.0	64.0
	Second year	9	36.0	36.0	100.0
	Total	25	100.0	100.0	

q2a Select: Friend suggested

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	23	92.0	92.0	92.0
	Selected	2	8.0	8.0	100.0
	Total	25	100.0	100.0	

q2b Select: Family suggested

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	23	92.0	92.0	92.0
	Selected	2	8.0	8.0	100.0
	Total	25	100.0	100.0	

q2c Select: Teacher suggested

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	12	48.0	48.0	48.0
	Selected	13	52.0	52.0	100.0
	Total	25	100.0	100.0	

q2d Select: School counselor

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	22	88.0	88.0	88.0
	Selected	3	12.0	12.0	100.0
	Total	25	100.0	100.0	

q2e Select: University Recruiter

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	24	96.0	96.0	96.0
	Selected	1	4.0	4.0	100.0
	Total	25	100.0	100.0	

q2f Select: Advertising

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	24	96.0	96.0	96.0
	Selected	1	4.0	4.0	100.0
	Total	25	100.0	100.0	

q2g Select: Quality and reputation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	15	60.0	60.0	60.0
	Selected	10	40.0	40.0	100.0
	Total	25	100.0	100.0	

q2h Select: Other

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	18	72.0	72.0	72.0
	Selected	7	28.0	28.0	100.0
	Total	25	100.0	100.0	

q2i Select: Other specified

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		19	76.0	76.0	76.0
	Dad got me interested in cad design	1	4.0	4.0	80.0
	high school teacher took class here	1	4.0	4.0	84.0
	i like cad	1	4.0	4.0	88.0
	Interest	1	4.0	4.0	92.0
	like CAD	1	4.0	4.0	96.0
	was always interested in it	1	4.0	4.0	100.0
	Total	25	100.0	100.0	

q3a Promote: TV advertising

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	*14*	*56.0*	*58.3*	*58.3*
	Selected	*10*	*40.0*	*41.7*	*100.0*
	Total	*24*	*96.0*	*100.0*	
Missing	System	*1*	*4.0*		
Total		*25*	*100.0*		

q3b Promote: Radio advertising

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	*21*	*84.0*	*87.5*	*87.5*
	Selected	*3*	*12.0*	*12.5*	*100.0*
	Total	*24*	*96.0*	*100.0*	
Missing	System	*1*	*4.0*		
Total		*25*	*100.0*		

q3c Promote: Video/DVD sent to schools

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	*19*	*76.0*	*79.2*	*79.2*
	Selected	*5*	*20.0*	*20.8*	*100.0*
	Total	*24*	*96.0*	*100.0*	
Missing	System	*1*	*4.0*		
Total		*25*	*100.0*		

q3d Promote: Ferris website

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	*18*	*72.0*	*75.0*	*75.0*
	Selected	*6*	*24.0*	*25.0*	*100.0*
	Total	*24*	*96.0*	*100.0*	
Missing	System	*1*	*4.0*		
Total		*25*	*100.0*		

q3e Promote: Visits from Admissions rep

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	*19*	*76.0*	*79.2*	*79.2*
	Selected	*5*	*20.0*	*20.8*	*100.0*
	Total	*24*	*96.0*	*100.0*	
Missing	System	*1*	*4.0*		

Total		25	100.0		

q3f Promote: CAD Drafting faculty visits to schools

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	11	44.0	45.8	45.8
	Selected	13	52.0	54.2	100.0
	Total	24	96.0	100.0	
Missing	System	1	4.0		
Total		25	100.0		

q3g Promote: CDTD alumni/students to visit schools

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	11	44.0	45.8	45.8
	Selected	13	52.0	54.2	100.0
	Total	24	96.0	100.0	
Missing	System	1	4.0		
Total		25	100.0		

q3h Promote: Career center or high school on campus visit

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	14	56.0	58.3	58.3
	Selected	10	40.0	41.7	100.0
	Total	24	96.0	100.0	
Missing	System	1	4.0		
Total		25	100.0		

q3i Promote: Direct invitation to parents and students to visit the program

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	19	76.0	79.2	79.2
	Selected	5	20.0	20.8	100.0
	Total	24	96.0	100.0	
Missing	System	1	4.0		
Total		25	100.0		

q3j Promote: Brochures/materials sent to school counselors/teachers

	Frequency	Percent	Valid Percent	Cumulative Percent

Valid	Not Selected	13	52.0	54.2	54.2
	Selected	11	44.0	45.8	100.0
	Total	24	96.0	100.0	
Missing	System	1	4.0		
Total		25	100.0		

q3k Promote: Other

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	24	96.0	100.0	100.0
Missing	System	1	4.0		
Total		25	100.0		

q3l Promote: Other specified

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		25	100.0	100.0	100.0

q4 Plan on obtaining four-year degree

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	20	80.0	80.0	80.0
	No	5	20.0	20.0	100.0
	Total	25	100.0	100.0	

q5 From which program

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Product Design Engineering Technology	8	32.0	40.0	40.0
	Manufacturing Engineering Technology	3	12.0	15.0	55.0
	Mechanical Engineering Technology	1	4.0	5.0	60.0
	Plastics Engineering Technology	4	16.0	20.0	80.0
	Other	4	16.0	20.0	100.0
	Total	20	80.0	100.0	
Missing	System	5	20.0		
Total		25	100.0		

q5a Other program specified

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		23	92.0	92.0	92.0

	Graphic Design	*1*	*4.0*	*4.0*	*96.0*
	Im transfering to another school	*1*	*4.0*	*4.0*	*100.0*
	Total	*25*	*100.0*	*100.0*	

q6 Percentage of time should spend on CAD

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	100%	*1*	*4.0*	*4.0*	*4.0*
	90%	*6*	*24.0*	*24.0*	*28.0*
	80%	*10*	*40.0*	*40.0*	*68.0*
	70%	*7*	*28.0*	*28.0*	*96.0*
	50%	*1*	*4.0*	*4.0*	*100.0*
	Total	*25*	*100.0*	*100.0*	

q7a Material presented in class is of adequate quality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	*5*	*20.0*	*21.7*	*21.7*
	Somewhat Agree	*10*	*40.0*	*43.5*	*65.2*
	Strongly Agree	*8*	*32.0*	*34.8*	*100.0*
	Total	*23*	*92.0*	*100.0*	
Missing	System	*2*	*8.0*		
Total		*25*	*100.0*		

q7b Instructors are well qualified

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	*1*	*4.0*	*4.5*	*4.5*
	Somewhat Disagree	*2*	*8.0*	*9.1*	*13.6*
	Somewhat Agree	*9*	*36.0*	*40.9*	*54.5*
	Strongly Agree	*10*	*40.0*	*45.5*	*100.0*
	Total	*22*	*88.0*	*100.0*	
Missing	System	*3*	*12.0*		
Total		*25*	*100.0*		

q7c Course content is being taught very well

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	*3*	*12.0*	*13.0*	*13.0*
	Somewhat Disagree	*4*	*16.0*	*17.4*	*30.4*
	Somewhat Agree	*11*	*44.0*	*47.8*	*78.3*
	Strongly Agree	*5*	*20.0*	*21.7*	*100.0*

	Total	23	92.0	100.0	
Missing	System	2	8.0		
Total		25	100.0		

q7d Each course content is in line with my needs/interests

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	8.0	8.7	8.7
	Somewhat Disagree	2	8.0	8.7	17.4
	Somewhat Agree	9	36.0	39.1	56.5
	Strongly Agree	10	40.0	43.5	100.0
	Total	23	92.0	100.0	
Missing	System	2	8.0		
Total		25	100.0		

q7e Material presented meets current standards

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	4.0	4.3	4.3
	Somewhat Disagree	2	8.0	8.7	13.0
	Somewhat Agree	10	40.0	43.5	56.5
	Strongly Agree	10	40.0	43.5	100.0
	Total	23	92.0	100.0	
Missing	System	2	8.0		
Total		25	100.0		

q7f Pace of material presented is appropriate

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	4	16.0	17.4	17.4
	Somewhat Disagree	4	16.0	17.4	34.8
	Somewhat Agree	8	32.0	34.8	69.6
	Strongly Agree	7	28.0	30.4	100.0
	Total	23	92.0	100.0	
Missing	System	2	8.0		
Total		25	100.0		

q7g Instructors care about your learning

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	8.0	8.7	8.7
	Somewhat Disagree	1	4.0	4.3	13.0

	Somewhat Agree	9	36.0	39.1	52.2
	Strongly Agree	11	44.0	47.8	100.0
	Total	23	92.0	100.0	
Missing	System	2	8.0		
Total		25	100.0		

q7h Material presented is relevant

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	4.0	4.3	4.3
	Somewhat Agree	10	40.0	43.5	47.8
	Strongly Agree	12	48.0	52.2	100.0
	Total	23	92.0	100.0	
Missing	System	2	8.0		
Total		25	100.0		

q7i Sufficient use of visual aids and materials

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	4.0	4.3	4.3
	Somewhat Disagree	1	4.0	4.3	8.7
	Somewhat Agree	9	36.0	39.1	47.8
	Strongly Agree	12	48.0	52.2	100.0
	Total	23	92.0	100.0	
Missing	System	2	8.0		
Total		25	100.0		

q7j Material is appropriate difficulty level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	12.0	13.0	13.0
	Somewhat Disagree	3	12.0	13.0	26.1
	Somewhat Agree	7	28.0	30.4	56.5
	Strongly Agree	10	40.0	43.5	100.0
	Total	23	92.0	100.0	
Missing	System	2	8.0		
Total		25	100.0		

q7k Assignment objectives are well thought out and clear

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	8.0	8.7	8.7

	Somewhat Disagree	4	16.0	17.4	26.1
	Somewhat Agree	7	28.0	30.4	56.5
	Strongly Agree	10	40.0	43.5	100.0
	Total	23	92.0	100.0	
Missing	System	2	8.0		
Total		25	100.0		

q7l Appropriate use of media, white board, etc.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	4.0	4.3	4.3
	Somewhat Disagree	1	4.0	4.3	8.7
	Somewhat Agree	10	40.0	43.5	52.2
	Strongly Agree	11	44.0	47.8	100.0
	Total	23	92.0	100.0	
Missing	System	2	8.0		
Total		25	100.0		

q7m Lectures are well prepared and organized

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	8.0	8.7	8.7
	Somewhat Disagree	4	16.0	17.4	26.1
	Somewhat Agree	10	40.0	43.5	69.6
	Strongly Agree	7	28.0	30.4	100.0
	Total	23	92.0	100.0	
Missing	System	2	8.0		
Total		25	100.0		

q7n Faculty are available for help

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	4.0	4.3	4.3
	Somewhat Disagree	3	12.0	13.0	17.4
	Somewhat Agree	7	28.0	30.4	47.8
	Strongly Agree	12	48.0	52.2	100.0
	Total	23	92.0	100.0	
Missing	System	2	8.0		
Total		25	100.0		

q7o Faculty are approachable

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	4.0	4.3	4.3
	Somewhat Disagree	3	12.0	13.0	17.4
	Somewhat Agree	6	24.0	26.1	43.5
	Strongly Agree	13	52.0	56.5	100.0
	Total	23	92.0	100.0	
Missing	System	2	8.0		
Total		25	100.0		

q7p My advisor has been valuable

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	12.0	13.0	13.0
	Somewhat Disagree	4	16.0	17.4	30.4
	Somewhat Agree	7	28.0	30.4	60.9
	Strongly Agree	9	36.0	39.1	100.0
	Total	23	92.0	100.0	
Missing	System	2	8.0		
Total		25	100.0		

q7q Materials are reviewed

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	4.0	4.3	4.3
	Somewhat Disagree	4	16.0	17.4	21.7
	Somewhat Agree	10	40.0	43.5	65.2
	Strongly Agree	8	32.0	34.8	100.0
	Total	23	92.0	100.0	
Missing	System	2	8.0		
Total		25	100.0		

q7r Student evaluation and grading are explained and clear

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	4.0	4.3	4.3
	Somewhat Disagree	3	12.0	13.0	17.4
	Somewhat Agree	11	44.0	47.8	65.2
	Strongly Agree	8	32.0	34.8	100.0
	Total	23	92.0	100.0	
Missing	System	2	8.0		
Total		25	100.0		

q7s Testing and evaluation procedures are fair

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	4.0	4.3	4.3
	Somewhat Disagree	2	8.0	8.7	13.0
	Somewhat Agree	10	40.0	43.5	56.5
	Strongly Agree	10	40.0	43.5	100.0
	Total	23	92.0	100.0	
Missing	System	2	8.0		
Total		25	100.0		

q7t Graded material is returned in a timely manner

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	8.0	8.7	8.7
	Somewhat Disagree	1	4.0	4.3	13.0
	Somewhat Agree	9	36.0	39.1	52.2
	Strongly Agree	11	44.0	47.8	100.0
	Total	23	92.0	100.0	
Missing	System	2	8.0		
Total		25	100.0		

q7u The program represents a good value for the money spent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	5	20.0	21.7	21.7
	Somewhat Disagree	1	4.0	4.3	26.1
	Somewhat Agree	9	36.0	39.1	65.2
	Strongly Agree	8	32.0	34.8	100.0
	Total	23	92.0	100.0	
Missing	System	2	8.0		
Total		25	100.0		

q7v The lab equipment is well maintained

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	5	20.0	21.7	21.7
	Somewhat Disagree	3	12.0	13.0	34.8
	Somewhat Agree	10	40.0	43.5	78.3
	Strongly Agree	5	20.0	21.7	100.0
	Total	23	92.0	100.0	
Missing	System	2	8.0		
Total		25	100.0		

q7w The lab computers are well maintained

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	8	32.0	34.8	34.8
	Somewhat Disagree	4	16.0	17.4	52.2
	Somewhat Agree	7	28.0	30.4	82.6
	Strongly Agree	4	16.0	17.4	100.0
	Total	23	92.0	100.0	
Missing	System	2	8.0		
Total		25	100.0		

q7x I made the right choice in selecting FSU's CDTD program

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	4	16.0	17.4	17.4
	Somewhat Disagree	2	8.0	8.7	26.1
	Somewhat Agree	9	36.0	39.1	65.2
	Strongly Agree	8	32.0	34.8	100.0
	Total	23	92.0	100.0	
Missing	System	2	8.0		
Total		25	100.0		

q7y I am comfortable recommending the program to others

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	5	20.0	21.7	21.7
	Somewhat Disagree	3	12.0	13.0	34.8
	Somewhat Agree	6	24.0	26.1	60.9
	Strongly Agree	9	36.0	39.1	100.0
	Total	23	92.0	100.0	
Missing	System	2	8.0		
Total		25	100.0		

q8 Please elaborate here

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		19	76.0	76.0	76.0
	in cdtd 122 with dan wanink i believe we were given an unreasonable amount of projects to complete in the given time period. this did not teach me anything but to throw things together just to meet a obserd deadline. this class harmed much of my work for other classes because of being over worked.	1	4.0	4.0	80.0

	need better computers	1	4.0	4.0	84.0
	Need better computers for first year students. I probably failed the performance part of the final exam because the computer was too slow.	1	4.0	4.0	88.0
	The computers in the lab are not compatable with the work that is needed to be done to be successful in this program. I felt that because the computers were not as efficient as we needed them to be it put a dent in alot of peoples grade this year in the sophmores grade and it is unfair. Complaints were made and nothing was still done. I will not recommend this program to anyone because of that. My GPA is in jepordy because no one listened to us when we said we needed better computers or the workload should have been cut short.	1	4.0	4.0	92.0
	The lab computers need to be faster and not have so many problems and network failures. To make the computers faster is to have 8 gigs of ram, 4 core processer, and an NVIDIA GForce 9800 graphics card.	1	4.0	4.0	96.0
	The work load in CDTD 122 is overwhelming and a major deturrant to the program. Too much work is assigned and it seems the instructor isnt concened with your leanening of the material, only that you get it done.	1	4.0	4.0	100.0
	Total	25	100.0	100.0	

q9a CAD hardware

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Dissatisfied	10	40.0	40.0	40.0
	Somewhat Dissatisfied	5	20.0	20.0	60.0
	Somewhat Satisfied	6	24.0	24.0	84.0
	Very Satisfied	4	16.0	16.0	100.0
	Total	25	100.0	100.0	

q9b CAD software

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Dissatisfied	2	8.0	8.0	8.0
	Somewhat Dissatisfied	6	24.0	24.0	32.0
	Somewhat Satisfied	9	36.0	36.0	68.0
	Very Satisfied	8	32.0	32.0	100.0
	Total	25	100.0	100.0	

q9c Advanced equipment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Dissatisfied	5	20.0	20.0	20.0
	Somewhat Satisfied	9	36.0	36.0	56.0
	Very Satisfied	11	44.0	44.0	100.0

	Total	*25*	*100.0*	*100.0*	

q9d Classroom environment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Dissatisfied	*1*	*4.0*	*4.0*	*4.0*
	Somewhat Dissatisfied	*1*	*4.0*	*4.0*	*8.0*
	Somewhat Satisfied	*12*	*48.0*	*48.0*	*56.0*
	Very Satisfied	*11*	*44.0*	*44.0*	*100.0*
	Total	*25*	*100.0*	*100.0*	

q9e Classroom furniture

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Dissatisfied	*1*	*4.0*	*4.0*	*4.0*
	Somewhat Satisfied	*7*	*28.0*	*28.0*	*32.0*
	Very Satisfied	*17*	*68.0*	*68.0*	*100.0*
	Total	*25*	*100.0*	*100.0*	

q9f Textbooks

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Dissatisfied	*1*	*4.0*	*4.0*	*4.0*
	Somewhat Dissatisfied	*6*	*24.0*	*24.0*	*28.0*
	Somewhat Satisfied	*13*	*52.0*	*52.0*	*80.0*
	Very Satisfied	*5*	*20.0*	*20.0*	*100.0*
	Total	*25*	*100.0*	*100.0*	

q9g Plotters

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Dissatisfied	*1*	*4.0*	*4.0*	*4.0*
	Somewhat Satisfied	*14*	*56.0*	*56.0*	*60.0*
	Very Satisfied	*10*	*40.0*	*40.0*	*100.0*
	Total	*25*	*100.0*	*100.0*	

q9h Printers

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Dissatisfied	*3*	*12.0*	*12.0*	*12.0*
	Somewhat Satisfied	*13*	*52.0*	*52.0*	*64.0*

	Very Satisfied	9	36.0	36.0	100.0
	Total	25	100.0	100.0	

q9i Faculty advising

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Dissatisfied	2	8.0	8.0	8.0
	Somewhat Dissatisfied	3	12.0	12.0	20.0
	Somewhat Satisfied	13	52.0	52.0	72.0
	Very Satisfied	7	28.0	28.0	100.0
	Total	25	100.0	100.0	

q9j Lab hours-evenings

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Dissatisfied	3	12.0	12.0	12.0
	Somewhat Dissatisfied	3	12.0	12.0	24.0
	Somewhat Satisfied	10	40.0	40.0	64.0
	Very Satisfied	9	36.0	36.0	100.0
	Total	25	100.0	100.0	

q9k Lab hours-weekends

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Dissatisfied	6	24.0	24.0	24.0
	Somewhat Dissatisfied	5	20.0	20.0	44.0
	Somewhat Satisfied	10	40.0	40.0	84.0
	Very Satisfied	4	16.0	16.0	100.0
	Total	25	100.0	100.0	

q9l Student activities and clubs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Dissatisfied	3	12.0	12.0	12.0
	Somewhat Dissatisfied	7	28.0	28.0	40.0
	Somewhat Satisfied	10	40.0	40.0	80.0
	Very Satisfied	5	20.0	20.0	100.0
	Total	25	100.0	100.0	

q10 How could make CDTD better

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		9	36.0	36.0	36.0
	Better computers need to be available for future students. There needs to be a tutor for students so that projects can be explained in more detail. Everyone doesn't understand what instructors are saying right then and there. Professors need to be more understanding when students are complaining about the computers crashing, professors need to be more fair about getting work turned in. Its cool to have set dates but if comuters do not work then it is not fair for teachers to put a dent in our grade because of it. It's really not fair.	1	4.0	4.0	40.0
	Better computers.	5	20.0	20.0	60.0
	Create smaller classes. That way students get more attention.	1	4.0	4.0	64.0
	Dont make everything due at once	1	4.0	4.0	68.0
	FASTER COMPUTERS! They crash to much.	1	4.0	4.0	72.0
	get newer computers that can better handle the software.	1	4.0	4.0	76.0
	Have due dates on at least some projects	1	4.0	4.0	80.0
	I liked everything except how the software would freeze and close out randomly.	1	4.0	4.0	84.0
	i think that the CAD rooms need to be a little bit nicer. They need to make me feel like I can stay there for hours a day. Room 503 is a good example of this...but could be a little bit nicer. Room502 needs new computers badly	1	4.0	4.0	88.0
	Less work so the material can be learned and absorbed, instead of rushed through just to get to the next topic.	1	4.0	4.0	92.0
	make it 4 years	1	4.0	4.0	96.0
	The computers in room 503 of swan have very slow reaction time and sometimes your waiting up to 15-20 minutes to finish just a inch of data you have entered.	1	4.0	4.0	100.0
	Total	25	100.0	100.0	

q11 Aware of the placement data and average starting salary

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		8	32.0	32.0	32.0
	100% placement, $40,000 starting salary	1	4.0	4.0	36.0
	about $40,000	1	4.0	4.0	40.0
	No	6	24.0	24.0	64.0
	Somewhat	2	8.0	8.0	72.0
	Very aware	1	4.0	4.0	76.0
	Yes	5	20.0	20.0	96.0
	Yes and I am very pleased with that. There is one thing that I think this program needs to include next year. That is to add an internship requirement to get the two year degree. Students in this program do their research on finding jobs but it would be cool if the professors could help find internships that fit each and every student so that every student has an eqaul oppurtunity as far as that is concerned.	1	4.0	4.0	100.0
	Total	25	100.0	100.0	

q12 How necessary are lab experiences

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		7	28.0	28.0	28.0
	good	1	4.0	4.0	32.0
	i am in the lab six to ten hours each day to complete my work(mainly from cdtd 122) i believe that many of the projects we have done have been well thoughtout and helpful but lately getting getting too many assignments to be able to complete also repetitive.	1	4.0	4.0	36.0
	I have found the labs useful in that the students in my lab can learn off from each other we all have different ways of interpreting information and it helps to get others opinions in lab on how a design should go.	1	4.0	4.0	40.0
	its very important to work on what you have learned and make sure there is a clear understanding of everything.	1	4.0	4.0	44.0
	Lab is very helpful.	1	4.0	4.0	48.0
	The labs could be shorter so the material isnt worn out as fast.	1	4.0	4.0	52.0
	very high with all the amount of work we have.	1	4.0	4.0	56.0
	Very necessary	9	36.0	36.0	92.0
	Very necessary, without lab experiences we would not be as skilled in our designs as we are.	1	4.0	4.0	96.0
	without labs i would of never of learned the CAD program like i do now.	1	4.0	4.0	100.0
	Total	25	100.0	100.0	

q13 How has course structure helped

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		9	36.0	36.0	36.0
	alright	1	4.0	4.0	40.0
	Greatly	2	8.0	8.0	48.0
	half half	1	4.0	4.0	52.0
	Helps make me feel more disciplined.	1	4.0	4.0	56.0
	how to handle pressure	1	4.0	4.0	60.0
	i believe they have all helped me develope the necessary skills	1	4.0	4.0	64.0
	i feel confident that i can do work for a employer	1	4.0	4.0	68.0
	i have learned to not be scared of the program and started to like trying to figure out how to get something to work.	1	4.0	4.0	72.0
	i think we learn a lot of design techniques and learn how to work as a team to produce a final product.	1	4.0	4.0	76.0
	it gave us the experience	1	4.0	4.0	80.0
	It has given me a good mixture of mold design, die design, tool/ jig and fixture design which lead to a broad understanding of most skills necessary in industry.	1	4.0	4.0	84.0

	Mr. Rose's class is actually very helpful. When turning in drawings he makes sure that the bill of materials is perfect down to the T! That is a major help when he does it. Mr. Hill's class is very fun and its cool learning about the Mold Bases, he makes it fun to learn about it. Wanninks class just prepares you for bad employment. Its like having a manager(mr. wanink) and you are the designer trying to get things done and it just doesnt get done. He prepares you to learn how to deal with people that wait to the last minute.	*1*	*4.0*	*4.0*	*88.0*
	The program has deturred me from the CAD field.	*1*	*4.0*	*4.0*	*92.0*
	The structure is kind of jumble when it comes to my class CDTD-122	*1*	*4.0*	*4.0*	*96.0*
	yes.	*1*	*4.0*	*4.0*	*100.0*
	Total	*25*	*100.0*	*100.0*	

q14 How aware/have you utilized Career Services office

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		*13*	*52.0*	*52.0*	*52.0*
	Have not used	*2*	*8.0*	*8.0*	*60.0*
	I am aware of if it but haven't utilized it.	*1*	*4.0*	*4.0*	*64.0*
	I am not very aware and not sure how to get started with using the career services.	*1*	*4.0*	*4.0*	*68.0*
	I have not utilized it.	*1*	*4.0*	*4.0*	*72.0*
	i know there is a career services office here at ferris.	*1*	*4.0*	*4.0*	*76.0*
	Im not too aware of it. This program needs to do a better job of making students aware of this.	*1*	*4.0*	*4.0*	*80.0*
	no. i have never.	*1*	*4.0*	*4.0*	*84.0*
	Not very	*3*	*12.0*	*12.0*	*96.0*
	resume builder	*1*	*4.0*	*4.0*	*100.0*
	Total	*25*	*100.0*	*100.0*	

q15 How aware/have you utilized Academic Support Center

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		*11*	*44.0*	*44.0*	*44.0*
	I am aware and have used them only in extreme cases where my own knowledge was not sufficient for a decent grade.	*1*	*4.0*	*4.0*	*48.0*
	I have not utilized it.	*3*	*12.0*	*12.0*	*60.0*
	i have used the tutors for some of my classes	*1*	*4.0*	*4.0*	*64.0*
	i have went to the writing center before.	*1*	*4.0*	*4.0*	*68.0*
	I went to the tutor almost every day.	*1*	*4.0*	*4.0*	*72.0*
	im aware of it	*1*	*4.0*	*4.0*	*76.0*
	not much	*1*	*4.0*	*4.0*	*80.0*
	Not very	*1*	*4.0*	*4.0*	*84.0*
	slightly aware.	*1*	*4.0*	*4.0*	*88.0*
	usually get help from proffesors, classmates and upperclassmen	*1*	*4.0*	*4.0*	*92.0*
	Very aware	*1*	*4.0*	*4.0*	*96.0*

	yes. for math.	1	4.0	4.0	100.0
	Total	25	100.0	100.0	

q16 How aware/have you utilized Counseling Center

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		14	56.0	56.0	56.0
	I am aware of it, but have not used it.	1	4.0	4.0	60.0
	I have not utilized it.	3	12.0	12.0	72.0
	i have spoken to my advisors and spoken to other advisors to get a clear understanding of my education path and where i	1	4.0	4.0	76.0
	I know there is a counseling center that can be utilized if need be to help with any stress or problems I may have.	1	4.0	4.0	80.0
	im aware of it	1	4.0	4.0	84.0
	Never been there	2	8.0	8.0	92.0
	never had to go there.	1	4.0	4.0	96.0
	Not at all	1	4.0	4.0	100.0
	Total	25	100.0	100.0	

q17 How aware/have you utilized the Educ & Career Couns Ctr

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		14	56.0	56.0	56.0
	I am aware of it, but have not used it.	1	4.0	4.0	60.0
	I have not utilized it.	5	20.0	20.0	80.0
	im aware of it	1	4.0	4.0	84.0
	never had to go there	1	4.0	4.0	88.0
	Not at all	1	4.0	4.0	92.0
	should be headed.	1	4.0	4.0	96.0
	Very aware.	1	4.0	4.0	100.0
	Total	25	100.0	100.0	

q18 Additional comments

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		23	92.0	92.0	92.0
	NEED BETTER COMPUTERS!!!!!!!!	1	4.0	4.0	96.0
	WE NEED BETTER AND FASTER COMPUTERS! Solid Edge ST needs a larger processer and more gigs of ram(preferibly 8) to run correctly.	1	4.0	4.0	100.0
	Total	25	100.0	100.0	

CAD DRAFTING/TOOL DESIGN FACULTY APR SURVEY

This survey was completed after careful review of other surveys conducted for this program review. The concerns, comments, criticisms, responses, and recommendations of graduates, students, employers, and advisory committee members were evaluated and the questions for this survey were determined, for the most part, from those responses. The confidence expressed by the students and graduates in the faculty's ability and knowledge of the industry and in the presentation of the materials and industrial related applications affirms your role in this review process. It is of greatest importance that the views and opinions of each faculty member be expressed to continue this program's quality education. Please complete and submit. Your assistance is sincerely appreciated.

Curriculum Perceptions

Q1 Please indicate your level of satisfaction with each of the following skills of typical CDTD students

relative to other FSU students.
Very
Dissatisfied
Somewhat
Dissatisfied
Somewhat
Satisfied Very Satisfied
Written communication mlkj n mlkj n mlkj n mlkj n

Verbal communication nmlkjnmlkjnmlkjnmlkjVerbal communicationnmlkjnmlkjnmlkjnmlkj
Quantitative mkjnj mkjnj mkj mkjnj

llln l

Problem-solving nmlkjnmlkjnmlkjnmlkjProblem-solvingnmlkjnmlkjnmlkjnmlkj
Time management mkjnj mkjnj mkj mkjnj

llln l

Individual project management nmlkjnmlkjnmlkjnmlkjIndividual project managementnmlkjnmlkjnmlkjnmlkj
Q2 We have made changes in the curriculum. Please indicate your level of agreement that the following

areas are being taught adequately.

Strongly Somewhat Somewhat

Disagree Disagree Agree Strongly Agree

Geometrical Construction mkjnj mkjnj mkjmkjnj

llln l

Orthographic Projection nmlkjnmlkjnmlkjnmlkjOrthographic Projectionnmlkjnmlkjnmlkjnmlkj
Sketching mkjnj mkjnj mkj mkjnj

llln l

Sectioning nmlkjnmlkjnmlkjnmlkjSectioningnmlkjnmlkjnmlkjnmlkj
Auxiliary Views mkjnj mkjnj mkj mkjnj

llln l

Dimensioning nmlkjnmlkjnmlkjnmlkjDimensioningnmlkjnmlkjnmlkjnmlkj
Assemblies mkjnj mkjnj mkj mkjnj

llln l

Descriptive Geometry nmlkjnmlkjnmlkjnmlkjDescriptive Geometrynmlkjnmlkjnmlkjnmlkj
llln l

Development of Solid Models for CAE use mkjnj mkjnj mkj mkjnj

Q3 For each item, please rate its importance to the program/curriculum at the present time.

Somewhat Isn't Currently
Not Important Important Very Important Required

CAD Solid Models mknj mknj mkj mknj llln l

Parametric Models nmlkjnmlkjnmlkjnmlkjParametric Modelsnmlkjnmlkjnmlkjnmlkj
Rapid Prototyping mknj mknj mkj mknj

llln l

CAE Statics & Strengths nmlkjnmlkjnmlkjnmlkjCAE Statics & Strengthsnmlkjnmlkjnmlkjnmlkj
CAE Kinematics mknj mknj mkj mknj

llln l

CAE Moldfill nmlkjnmlkjnmlkjnmlkjCAE Moldfillnmlkjnmlkjnmlkjnmlkj
GD&T mknj mknj mkj mknj

llln l

Other nmlkjnmlkjnmlkjnmlkjOthernmlkjnmlkjnmlkjnmlkj
Please Specify:

Q4 Looking toward the next 5 years and beyond, what subjects/topics should be emphasized in the CDTD two-year degree?
Slightly Somewhat Greatly
Not Important Emphasized Emphasized Emphasized

Sketching mknj mknj mkj mknj

llln l

Surfacing in CAD nmlkjnmlkjnmlkjnmlkjSurfacing in CADnmlkjnmlkjnmlkjnmlkj
Mold Design mknj mknj mkj mknj

llln l

Die Design nmlkjnmlkjnmlkjnmlkjDie Designnmlkjnmlkjnmlkjnmlkj
Jig. Fixture, Gage Design mkjnj mkjnj mkj mkjnj

llln l

Special Machines nmlkjnmlkjnmlkjnmlkjSpecial Machinesnmlkjnmlkjnmlkjnmlkj
Product Design mkjnj mkjnj mkj mkjnj

llln l

Dimensioning, Tolerances, GD&T nmlkjnmlkjnmlkjnmlkjDimensioning, Tolerances, GD&Tnmlkjnmlkjnmlkjnmlkj
CAE Die Simulation mkjnj mkjnj mkj mkjnj

llln l

AutoCAD 2D nmlkjnmlkjnmlkjnmlkjAutoCAD 2Dnmlkjnmlkjnmlkjnmlkj
Solid Modeling mkjnj mkjnj mkj mkjnj

llln l

Parametric Technology nmlkjnmlkjnmlkjnmlkjParametric Technologynmlkjnmlkjnmlkjnmlkj
Rapid Prototyping mkjnj mkjnj mkj mkjnj

llln l

Rapid Tooling nmlkjnmlkjnmlkjnmlkjRapid Toolingnmlkjnmlkjnmlkjnmlkj
Machine Tool Operations mkjnj mkjnj mkj mkjnj

llln l

Tool Building nmlkjnmlkjnmlkjnmlkjTool Buildingnmlkjnmlkjnmlkjnmlkj
Tool Path (CAM) mkjnj mkjnj mkj mkjnj

llln l

CMM nmlkjnmlkjnmlkjnmlkjCMMnmlkjnmlkjnmlkjnmlkj
Laser Measuring mkjnj mkjnj mkj mkjnj

llln l

Reverse Engineering nmlkjnmlkjnmlkjnmlkjReverse Engineeringnmlkjnmlkjnmlkjnmlkj
llln l

Other mkjnj mkjnj mkj mkjnj

Please Specify:

Q5 Please indicate your level of agreement with each of the following statements regarding the program

and its offerings.

Strongly Somewhat Somewhat

Disagree Disagree Agree Strongly Agree

The program should have only one mkjnj mkjnj mkj mkjnj

llln l

instructor per course when possible.

The program should use one instructor to
teach the lecture & another to conduct the
lab.
nmlkjnmlkjnmlkjnmlkjThe program should use one instructor toteach the lecture & another to conduct thelab.
nmlkjnmlkjnmlkjnmlkj
The program should have 2 entry points mkjnj mkjnj mkj mkjnj

llln l

(Fall & Spring).

The program should operate year-round
including classes & externships during the
summer term.
nmlkjnmlkjnmlkjnmlkjThe program should operate year-roundincluding classes & externships during thesummer term.
nmlkjnmlkjnmlkjnmlkj
The program should become/continue to mkjnj mkjnj mkj mkjnj

llln l

be involved with certifying various skills
with the industry.

There are currently too many classes
offered with the program.
nmlkjnmlkjnmlkjnmlkjThere are currently too many classesoffered with the program.
nmlkjnmlkjnmlkjnmlkj
Applicable supportive courses are relevant mkjnj mkjnj mkj mkjnj

llln l

to program goals & student needs.

The student to faculty ratio is sufficient to
permit optimum program effectiveness.
nmlkjnmlkjnmlkjnmlkjThe student to faculty ratio is sufficient topermit optimum program effectiveness.
nmlkjnmlkjnmlkjnmlkj
llln l

The CDTD program should be expanded mkjnj mkjnj mkj mkjnj

to four years.

Q6 Please indicate your level of agreement with each of the followings statements regarding facilities,

equipment & support mechanisms.

Strongly Somewhat Somewhat
Disagree Disagree Agree Strongly Agree

The program faculty has access to mknj mknj mkj mknj

llln l

adequate funds for faculty development.

The program has adequate leadership. nmlkjnmlkjnmlkjnmlkjThe program has adequate leadership.nmlkjnmlkjnmlkjnmlkj
The advisory board has adequate input & mkjnj mkjnj mkj mkjnj

llln l

influence for the program.

Adequate funds for equipment & supplies
are available for student usage.
nmlkjnmlkjnmlkjnmlkjAdequate funds for equipment & suppliesare available for student usage.
nmlkjnmlkjnmlkjnmlkj
The program computer labs have mkjnj mkjnj mkj mkjnj

llln l

adequate hardware.

Aides & lab assistants are available &
provide appropriate support for students &
faculty to insure maximum effectiveness of
the program.
nmlkjnmlkjnmlkjnmlkjAides & lab assistants are available &
provide appropriate support for students &
faculty to insure maximum effectiveness ofthe program.
nmlkjnmlkjnmlkjnmlkj
Office & clerical assistance is available to mkjnj mkjnj mkj mkjnj

llln l

enhance the effectiveness of program
faculty.

Equipment within the program is in
adequate supply.
nmlkjnmlkjnmlkjnmlkjEquipment within the program is inadequate supply.
nmlkjnmlkjnmlkjnmlkj
Equipment is operational, safe & well-mkjnj mkjnj mkj mkjnj

llln l

maintained.

Instructional facilities meet program
objectives including safety, functionality,
flexibility & satisfying students' needs.
nmlkjnmlkjnmlkjnmlkjInstructional facilities meet programobjectives including safety, functionality,
flexibility & satisfying students' needs.
nmlkjnmlkjnmlkjnmlkj
Scheduling of facilities & equipment is mkjnj mkjnj mkj mkjnj

llln l

planned & consistent w/ quality instruction.

Materials & supplies are readily available
& in sufficient quantity to support quality
instruction.
nmlkjnmlkjnmlkjnmlkjMaterials & supplies are readily available& in sufficient quantity to support qualityinstruction.
nmlkjnmlkjnmlkjnmlkj
Adequate funds are available for new mkjnj mkjnj mkj mkjnj

llln l

equipment and/or equipment repair.

Fund allocation is consistent w/ program
objectives & instructor input.
nmlkjnmlkjnmlkjnmlkjFund allocation is consistent w/ programobjectives & instructor input.
nmlkjnmlkjnmlkjnmlkj
The current number of students assigned mkjnj mkjnj mkj mkjnj

llln l

to each advisor is manageable.

Q7 Please indicate your level of agreement with each of the followings statements regarding placement.
Strongly Somewhat Somewhat
Disagree Disagree Agree Strongly Agree

Current labor market & employment data mkjnj mkjnj mkj mkjnj

llln l

are systematically utilized for the
development & evaluation of the program.

Current job skills & trends are
systematically utilized for the development
& evaluation of the program.
nmlkjnmlkjnmlkjnmlkjCurrent job skills & trends aresystematically utilized for the development& evaluation of the
program.
nmlkjnmlkjnmlkjnmlkj
Current graduate follow-up data are mkjnj mkjnj mkj mkjnj

llln l

systematically utilized for the development
& evaluation of the program.

The program curriculum is relevant to
students once they have entered the
workforce.
nmlkjnmlkjnmlkjnmlkjThe program curriculum is relevant tostudents once they have entered theworkforce.
nmlkjnmlkjnmlkjnmlkj
llln l

The University has an effective system for mkjnj mkjnj mkj mkjnj

job placement of students within the
program.

Q8 If you could change the CAD Drafting/Tool Q9 Please use this space for additional comments.

Design program in any way you desired, what

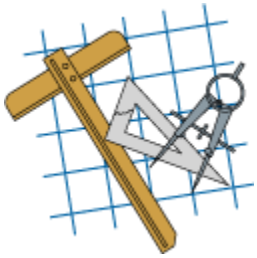
would you do? This may include program

content, materials, name, methods,

configuration, etc. Please be as open and

candid as possible.

Thank you for your time and feedback.



2E. Faculty perceptions: The purpose of this activity is to assess faculty perceptions regarding the following aspects of the program: curriculum, resources, admissions standards, degree of commitment by the administration, processes and procedures used, and their overall feelings. Additional items that may be unique to the program can be incorporated in this survey.

CAD and Tool Design

Faculty survey results

The CAD and Tool design (CDTD) faculty completed a survey on their program. There are three faculty and all participated. The focus of the report will center on two aspects of their responses. First, they were all in disagreement or second – was there a large disparity in the faculty's answers. Bar graphs of answers in question are following the written review.

Skill relative to other FSU students

The faculty seemed to be split on the "*quantitative skills*" of their students but were generally not satisfied with their students reasoning capabilities. They also identified "*time management*" as another area of weakness.

Areas Taught adequately

Descriptive geometry seems to be an outcome that questions were raised about. The faculty did not agree at all with answers ranging from Strongly disagree to somewhat agree. Questions were also raised about the adequate *teaching of sectioning, auxiliary views and Dimensioning*.

Importance to Program /Curriculum

For the most part faculty were agreement with their answers to this set of questions. Disagreement arose when CAE (computer aided engineering) concepts were questioned. Two faculty thought CAE *Statics and strengths* was not important while one thought it was very important. Interestingly, CAE – *kinematics was opposed*; two faculty thought it was very important while the third suggested it was not important.

Subject/Topics to emphasize

The faculty were in agreement on subjects (program outcomes) emphasis in their curriculum. Disagreement arose on *emphasizing Jig, Fixture, Gage Design; Special machine design; CAE simulation*; and both *Rapid prototypes* and *Rapid tooling.*

The diverse answers regarding rapid tooling and rapid prototyping seem to echo answers in the Importance to the program section.

Program Offerings

There was some disparity between the faculty when discussing, *only one instructor per course* as one faculty strongly disagreed and the others agreed. Additionally there was a range of answers for *Operate year-round*, some faculty supported this notion while others disagreed strongly. There was also a little disagreement regarding, *currently too many classes*, 2 faculty strongly disagreed while one somewhat agreed. *Involvement with Certifying skills* also garnered a diverse response from the faculty that ranged

from strongly disagree to strongly agree. The faculty also disagreed on the concept of *expanding to a 4 year degree*, two strongly disagreed while one somewhat agreed.

Facilities, Equipment and Support

Faculty were split regarding the program's *funding* but disagreed with the f*unding specifically tied to equipment and supplies* statement and Adequate funding for new equipment/repair. They also felt that there not *adequate leadership* for the program and low clerical *support*. In addition there was some concern expressed for the *fund allocation consistency*?

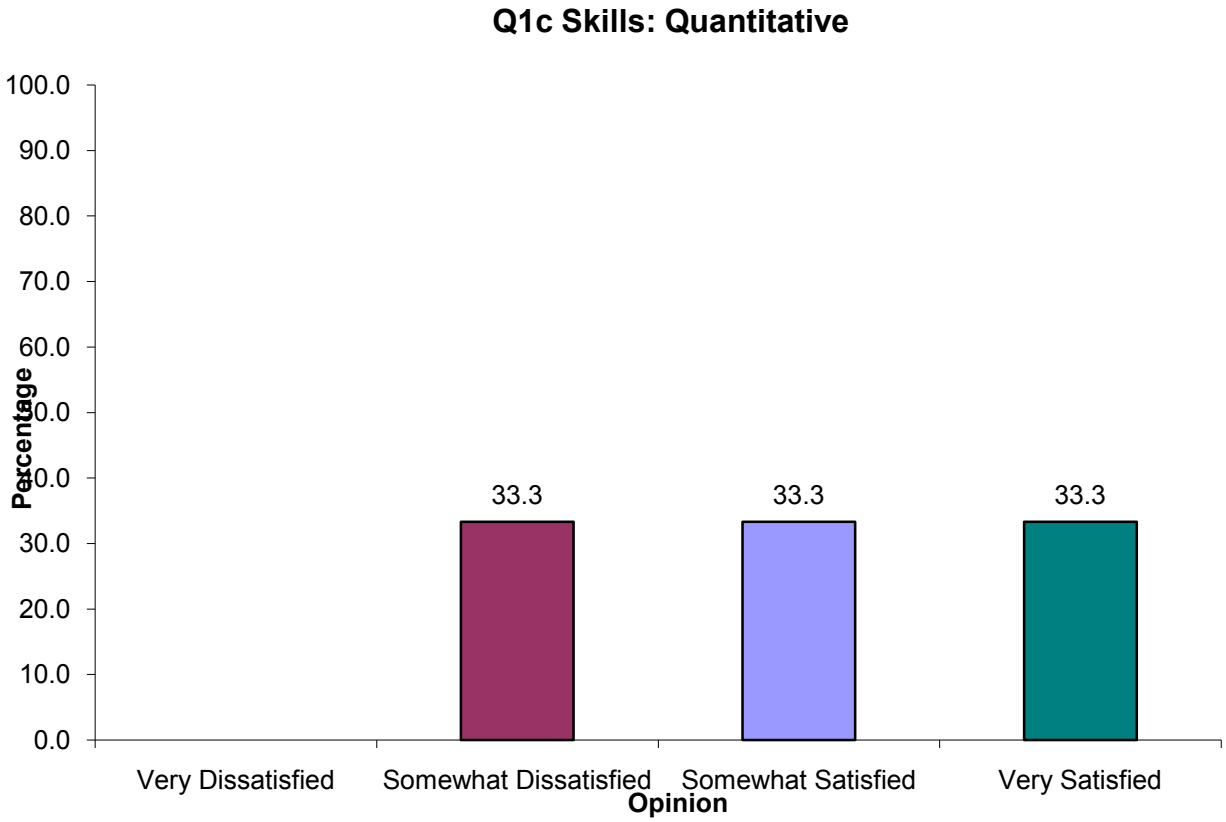
Placement

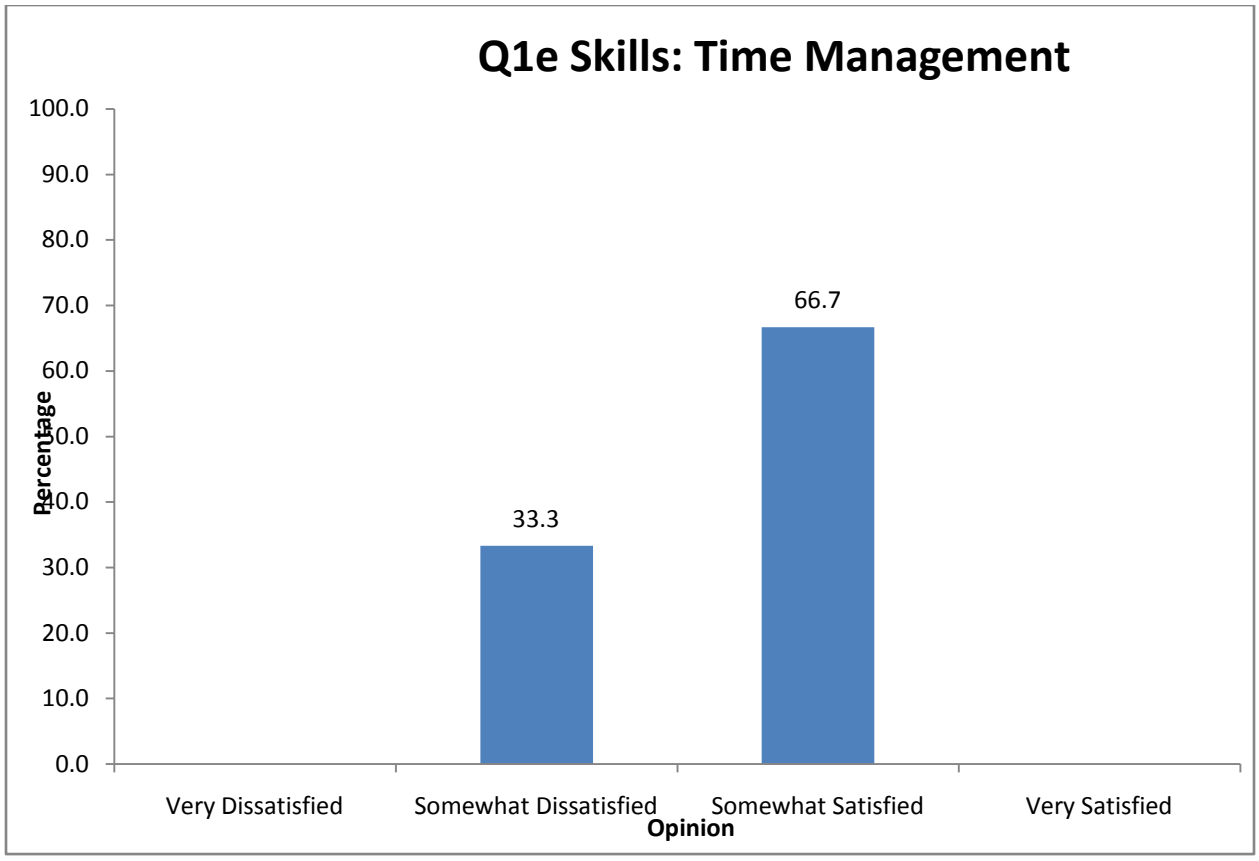
Faculty were split on their perspective of use of Current labor mrk/employment data utilization, but none strongly disagreed

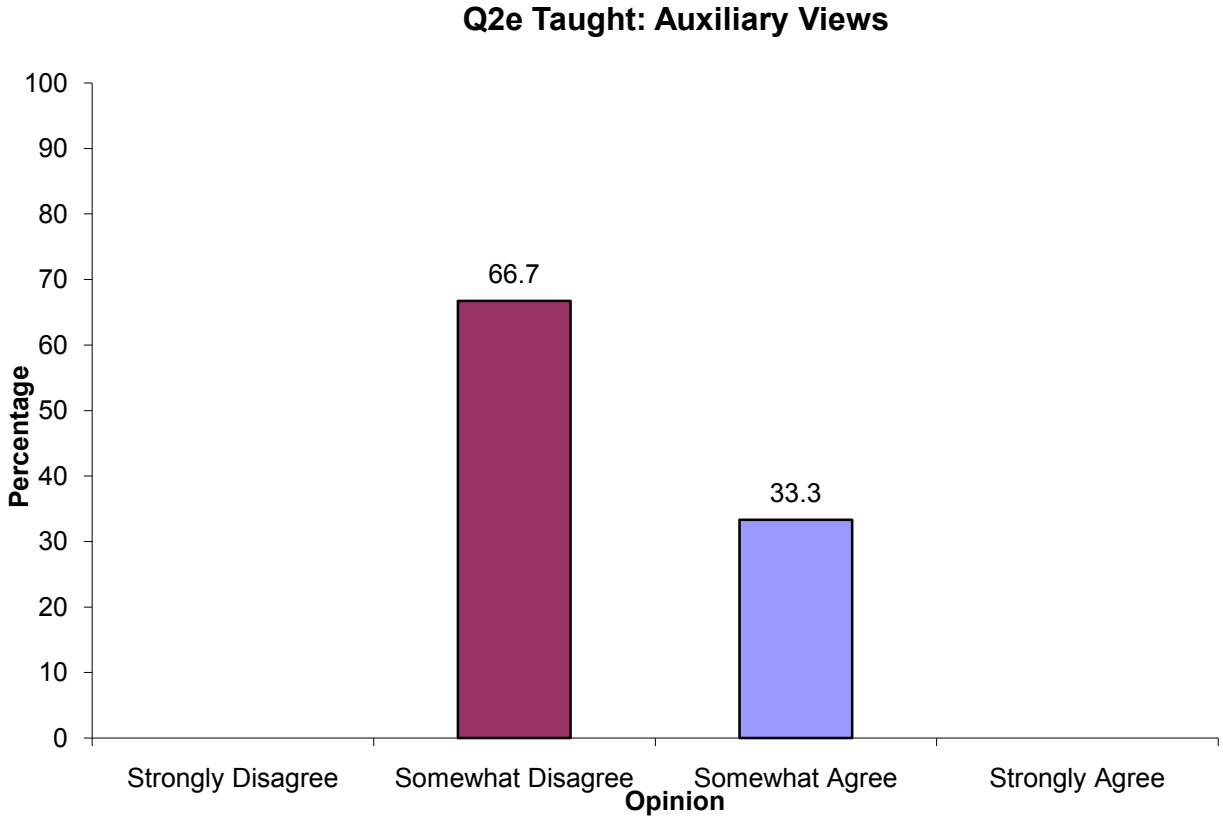
Conclusions

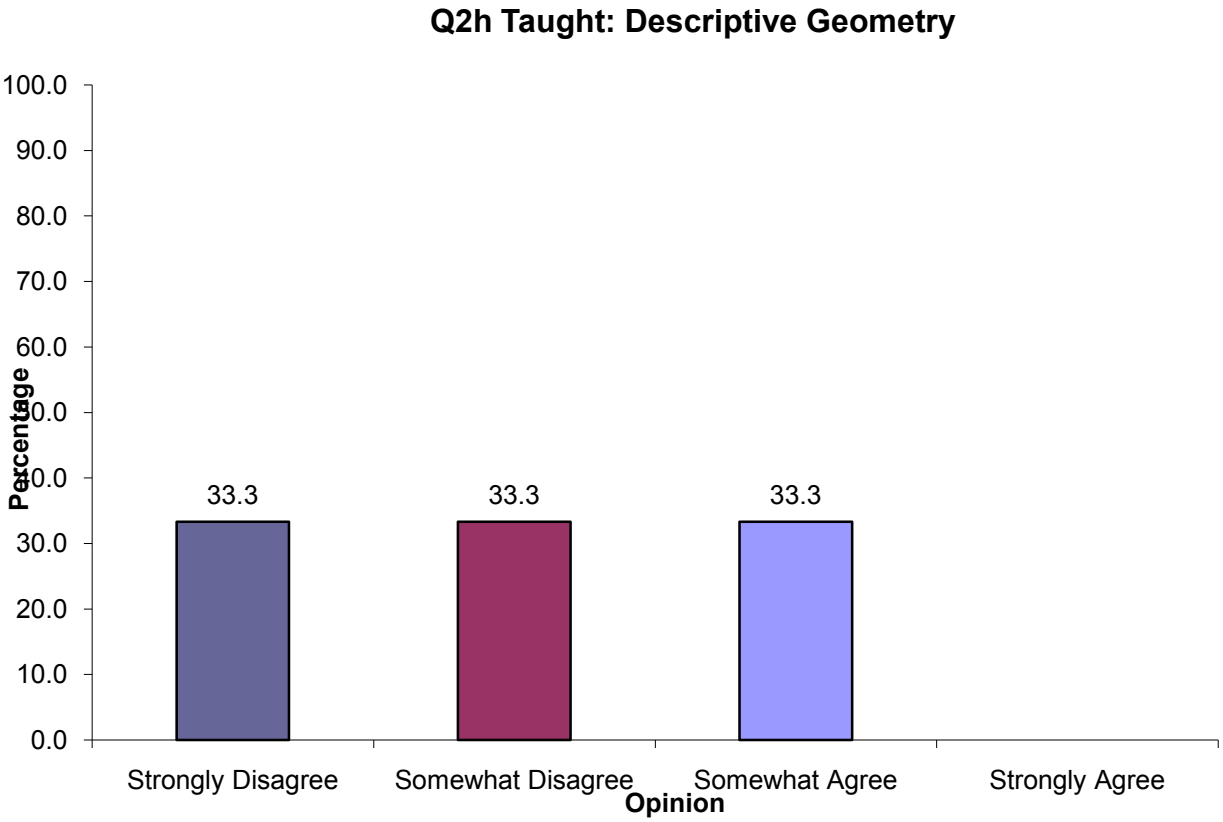
The CAD and Tool Design faculty feel under represented both in the department and at the College level. This is supported by their responses involved in Question series #6 .

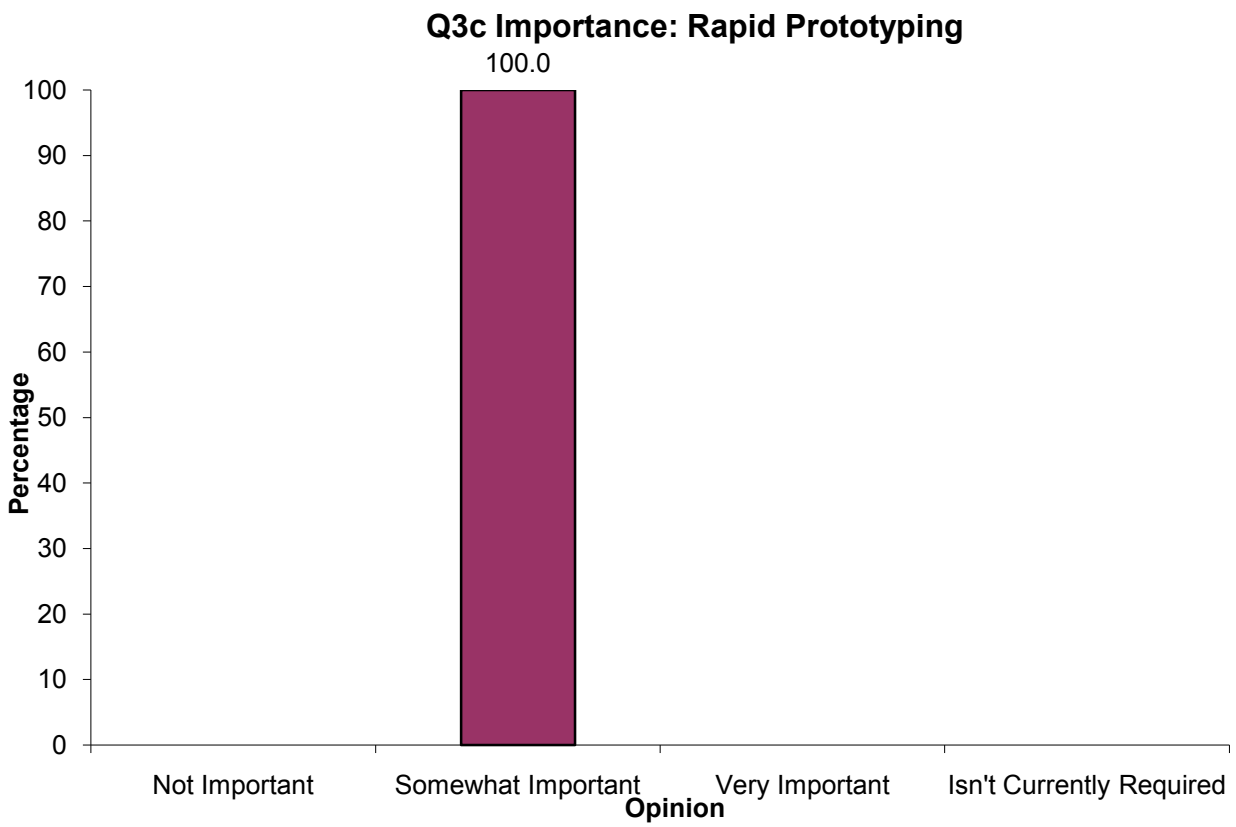
Additionally, there seems to be some disagreement on curricular content and its' coverage. Faculty identified short comings in *Time management* and quantitative skills which are gained partially through non major coursework. In addition there is significant faculty disagreement with the programs curriculum. Some faculty felt that *Descriptive geometry teaching of sectioning, auxiliary views and Dimensioning* were not adequately covered within the current curriculum. Also there were questions raised about emphasizing of *Jig, Fixture, Gage Design; Special machine design; CAE simulation*; and both *Rapid prototyping* and *Rapid tooling* and their validity within the program.


Q1c Skills: Quantitative
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Percentage
33.3
33.3
33.3
Very Dissatisfied
Somewhat Dissatisfied
Somewhat Satisfied
Very Satisfied
Opinion

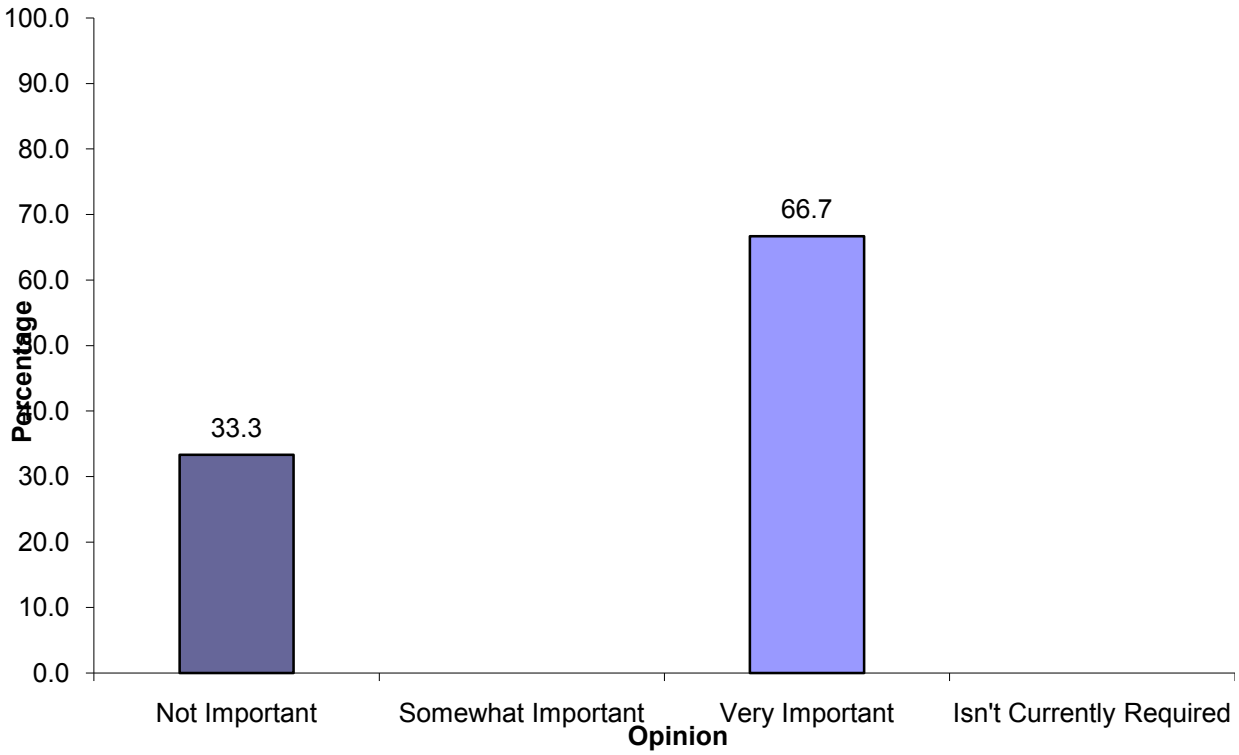

Q1e Skills: Time Management
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Percentage
33.3
66.7
Very Dissatisfied
Somewhat Dissatisfied
Somewhat Satisfied
Very Satisfied
Opinion


Q2e Taught: Auxiliary Views
100
90
80
70
60
50
40
30
20
10
0
Percentage
66.7
33.3
Strongly Disagree
Somewhat Disagree
Somewhat Agree
Strongly Agree
Opinion

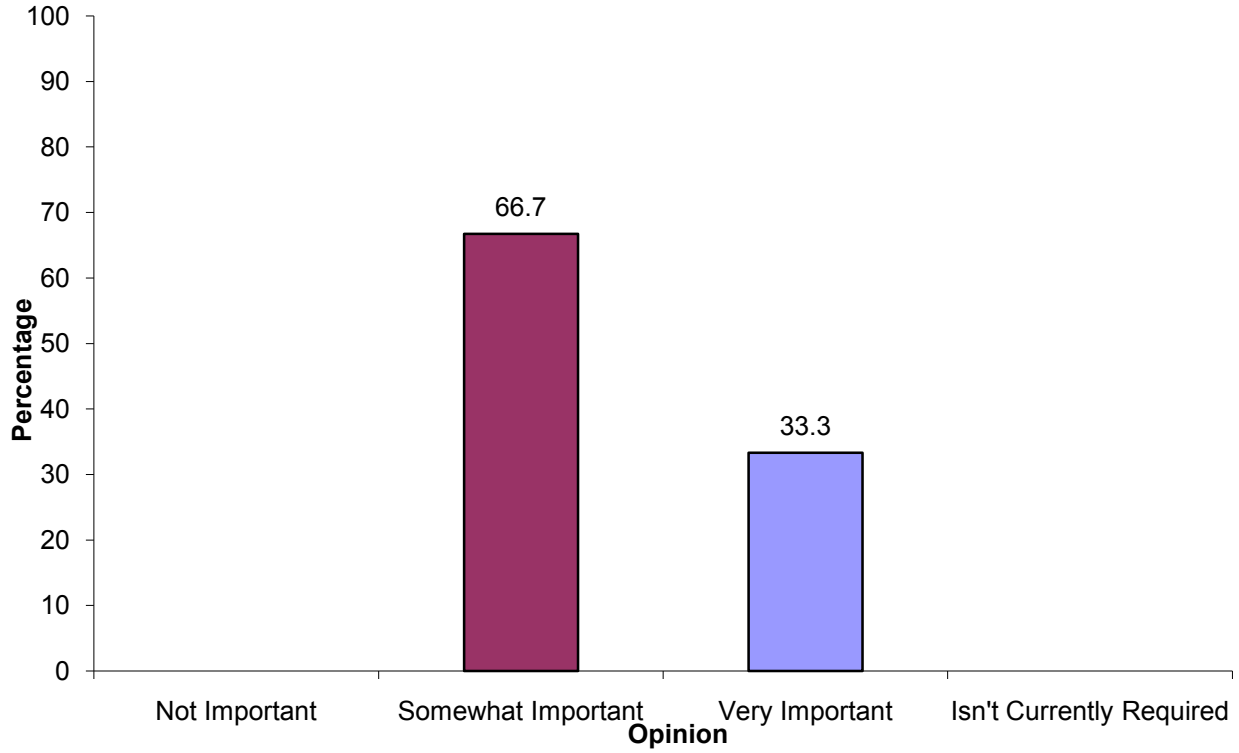

Q2h Taught: Descriptive Geometry
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Percentage
33.3
33.3
33.3
Strongly Disagree
Somewhat Disagree
Somewhat Agree
Strongly Agree
Opinion

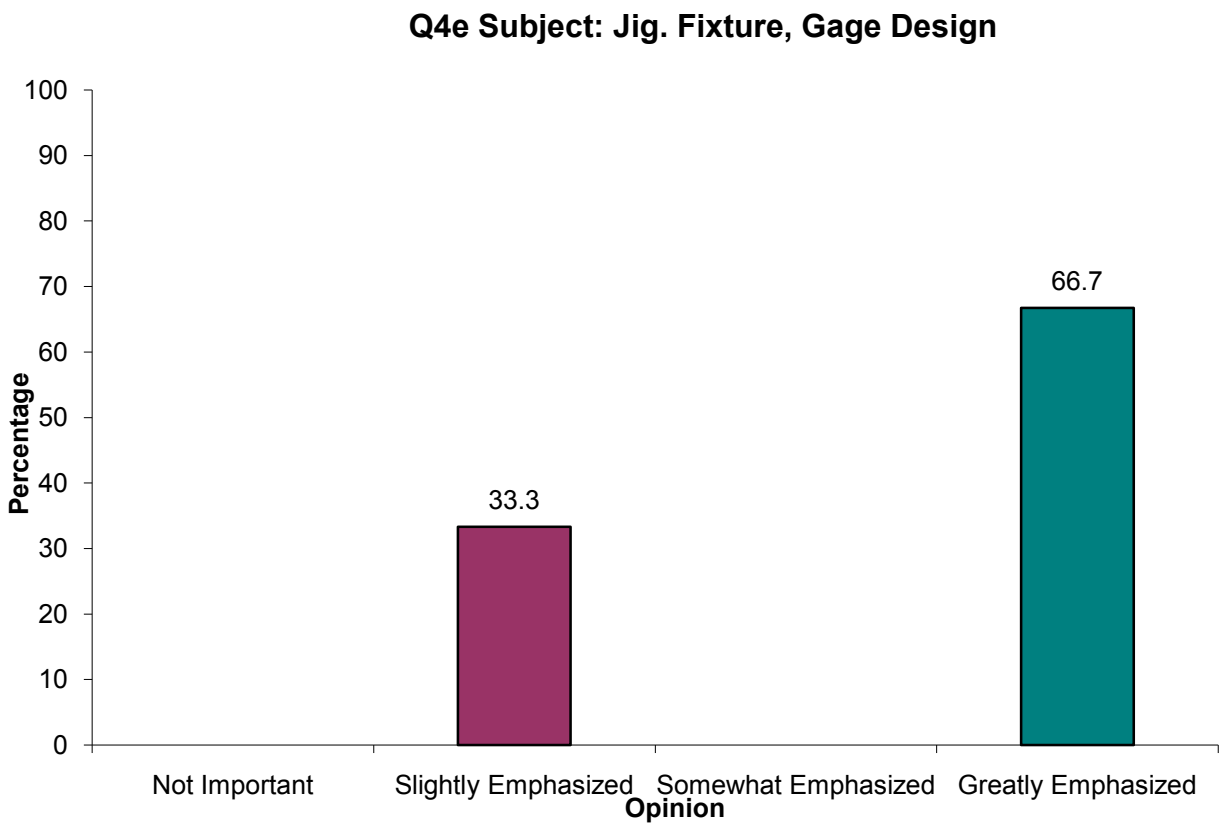

Q3c Importance: Rapid Prototyping
100.0
100
90
80
70
60
50
40
30
20
10
0
Percentage
Not Important
Somewhat Important
Very Important
Isn't Currently Required
Opinion

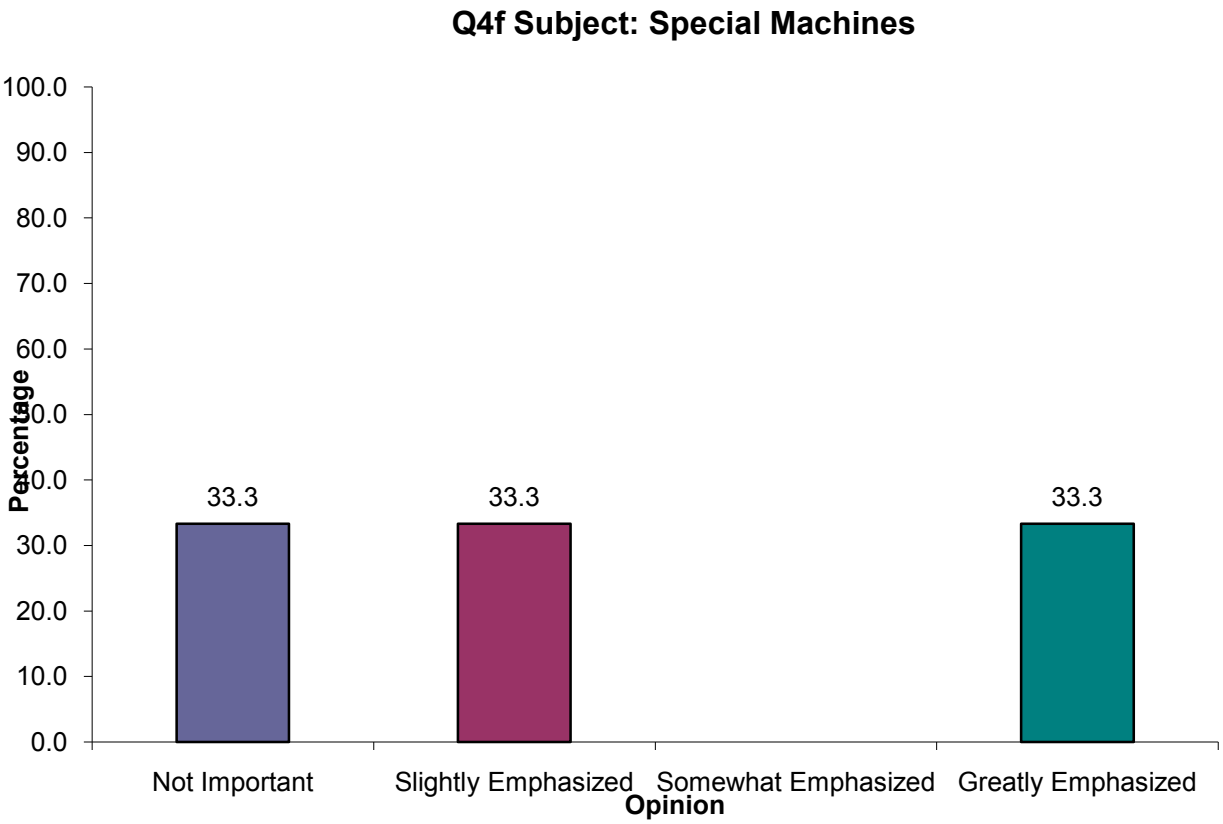
Q3e Importance: CAE Kinematics

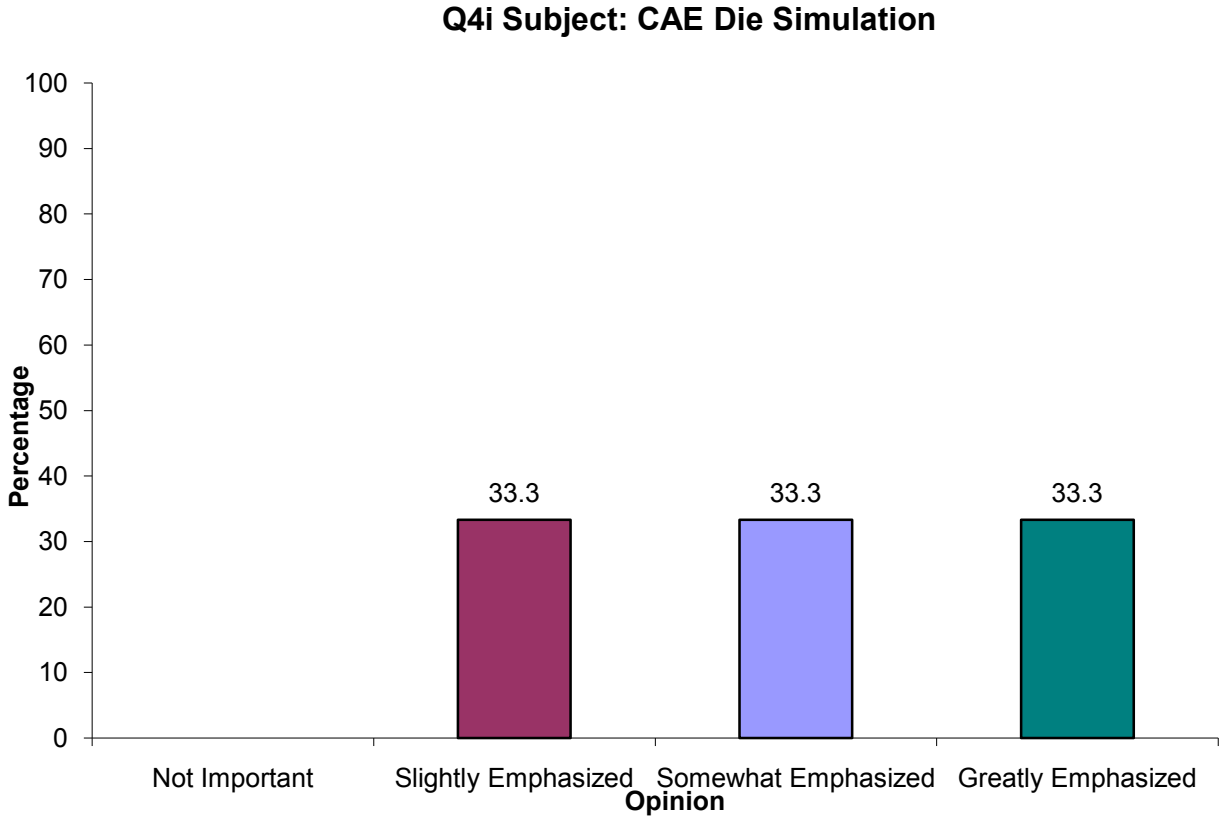


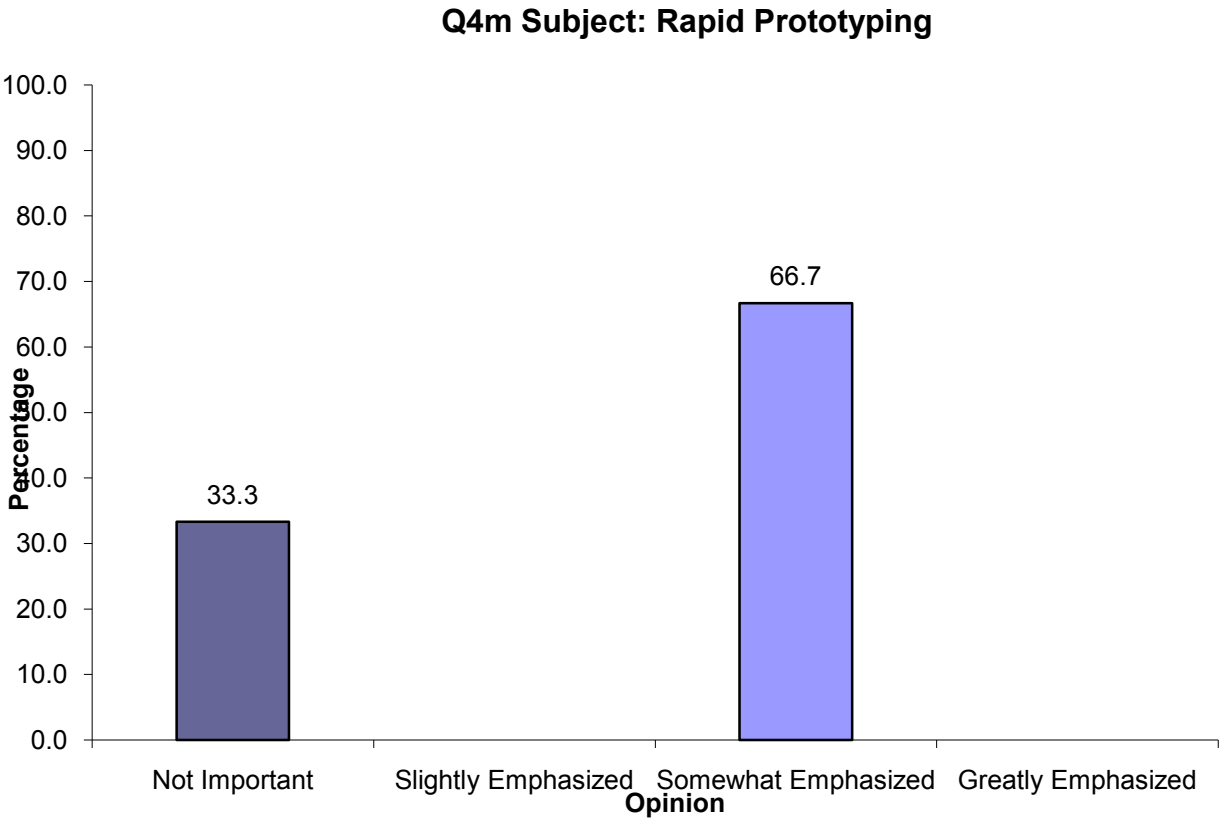
Q3f Importance: CAE Moldfill

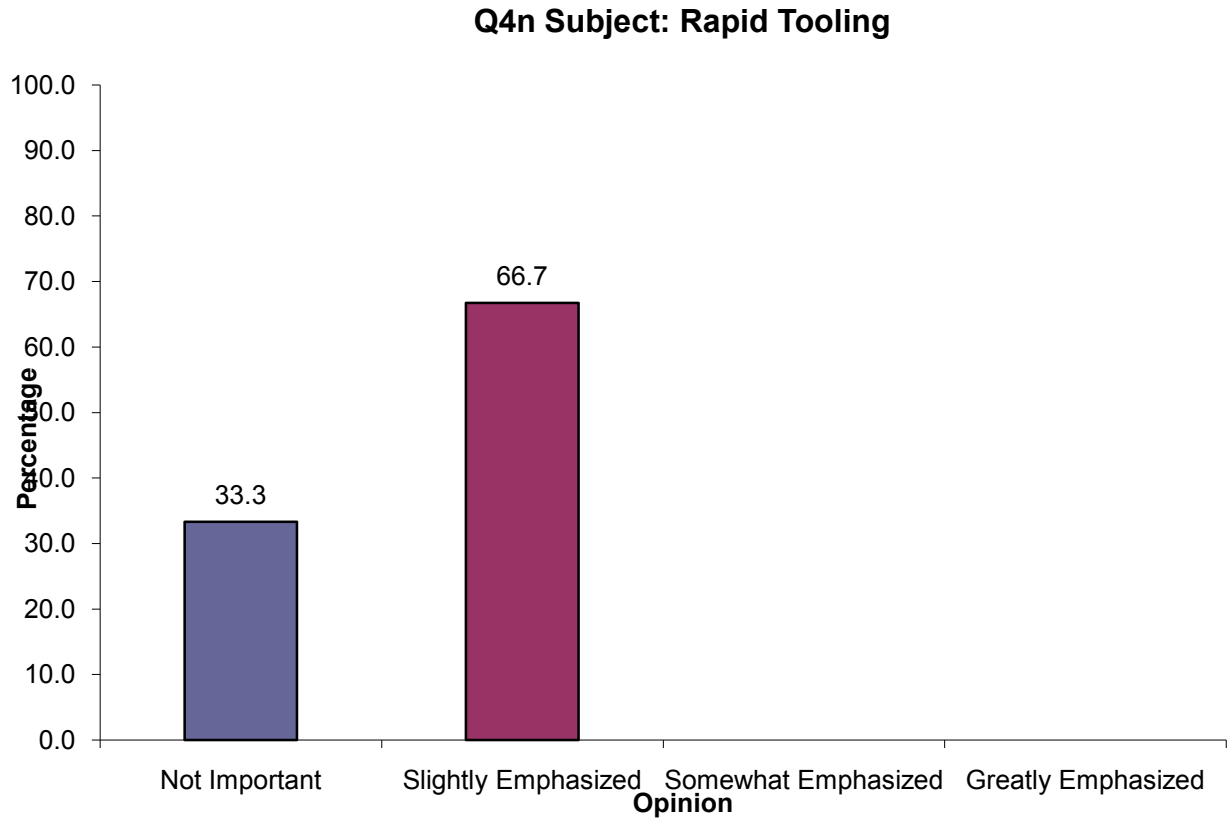


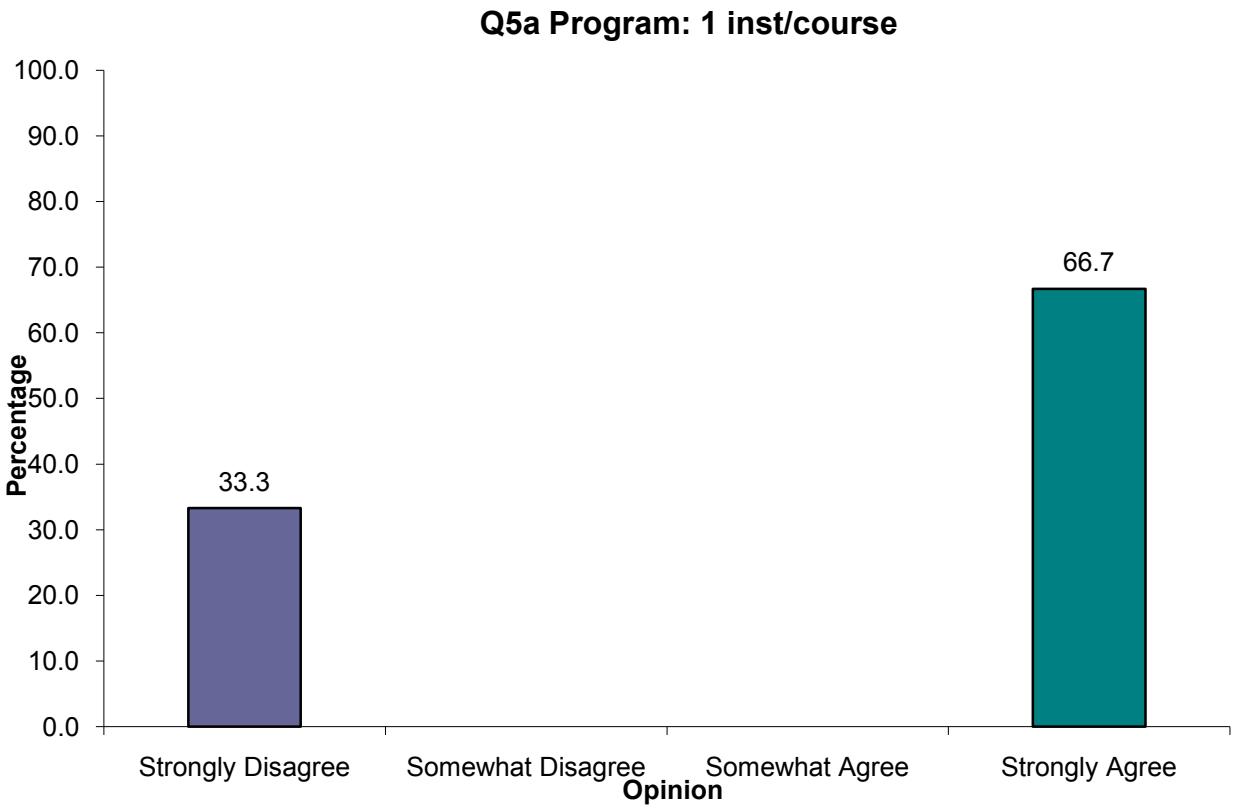

Q4e Subject: Jig. Fixture, Gage Design
100
90
80
70
60
50
40
30
20
10
0
Percentage
66.7
33.3
Not Important
Slightly Emphasized
Somewhat Emphasized
Greatly Emphasized
Opinion

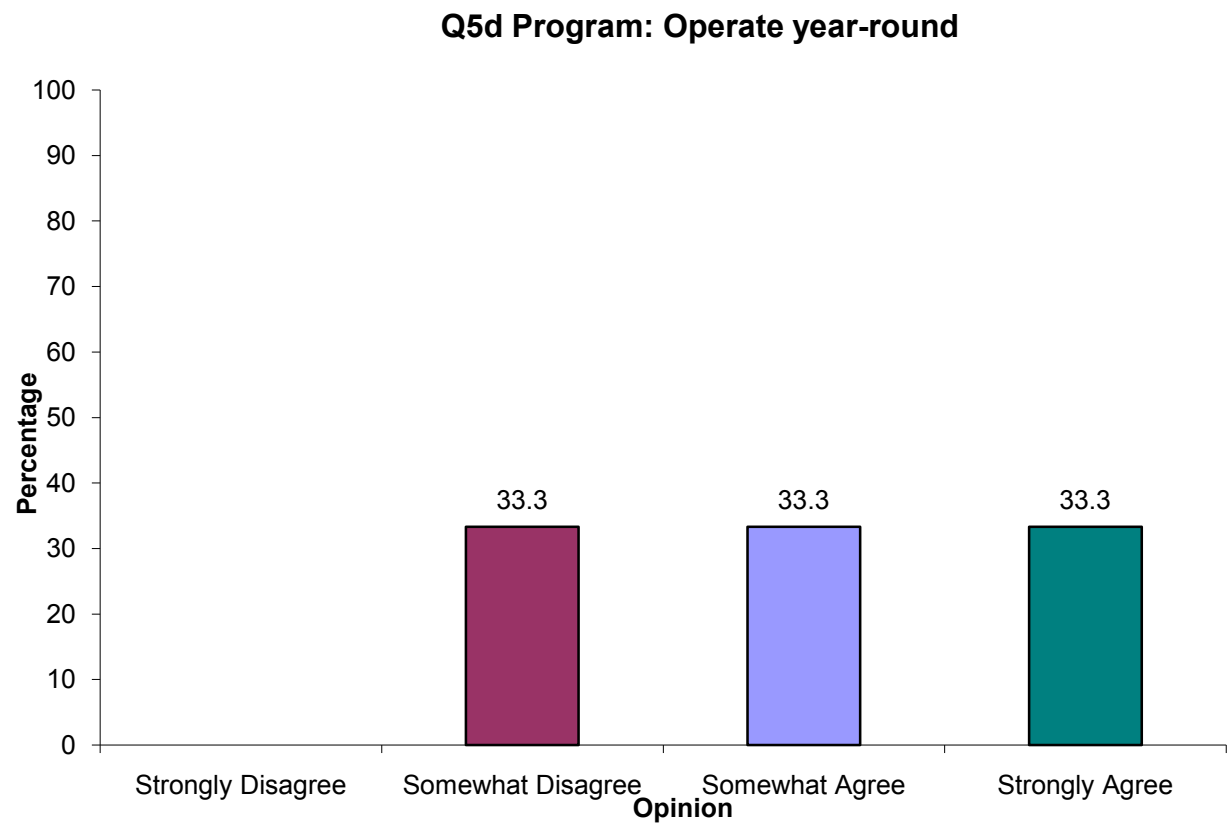

Q4f Subject: Special Machines
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Percentage
33.3
33.3
33.3
Not Important
Slightly Emphasized
Somewhat Emphasized
Greatly Emphasized
Opinion

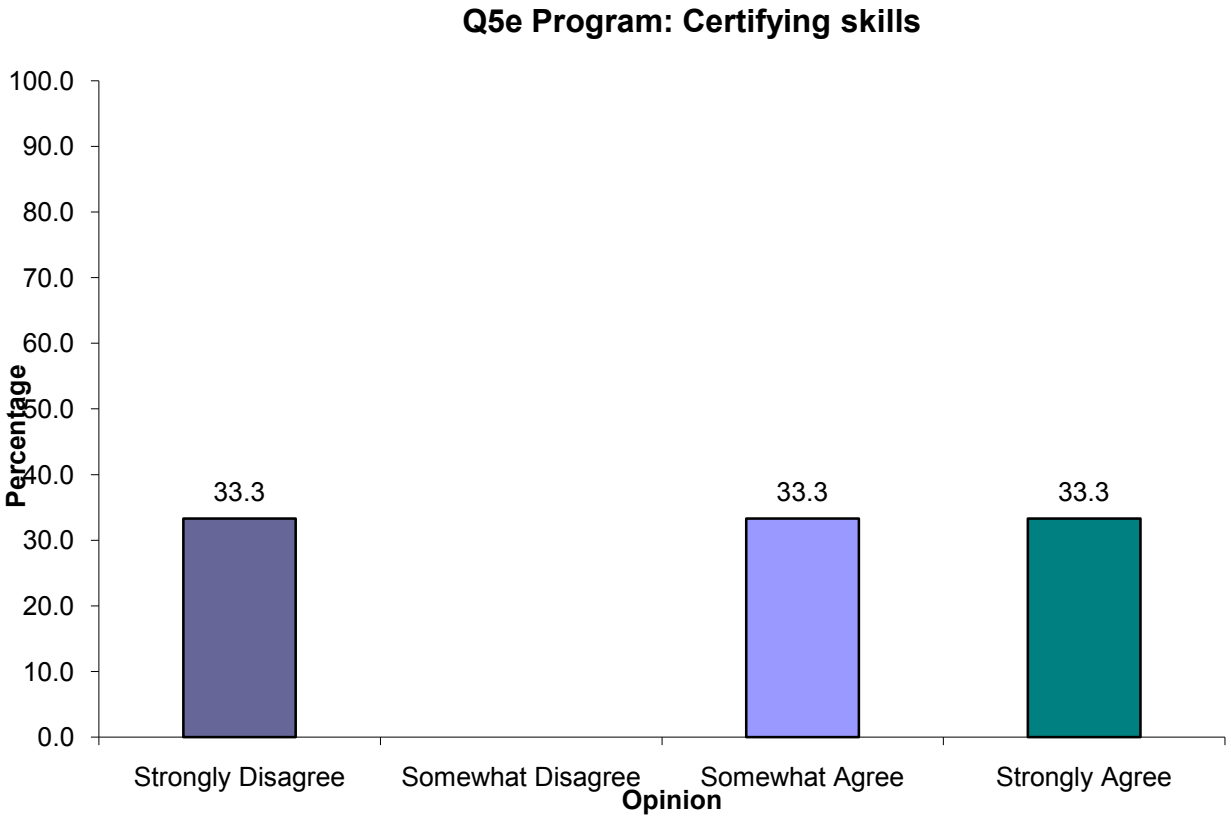

Q4i Subject: CAE Die Simulation
Percentage
100
90
80
70
60
50
40
30
20
10
0
33.3
33.3
33.3
Not Important
Slightly Emphasized
Somewhat Emphasized
Greatly Emphasized
Opinion

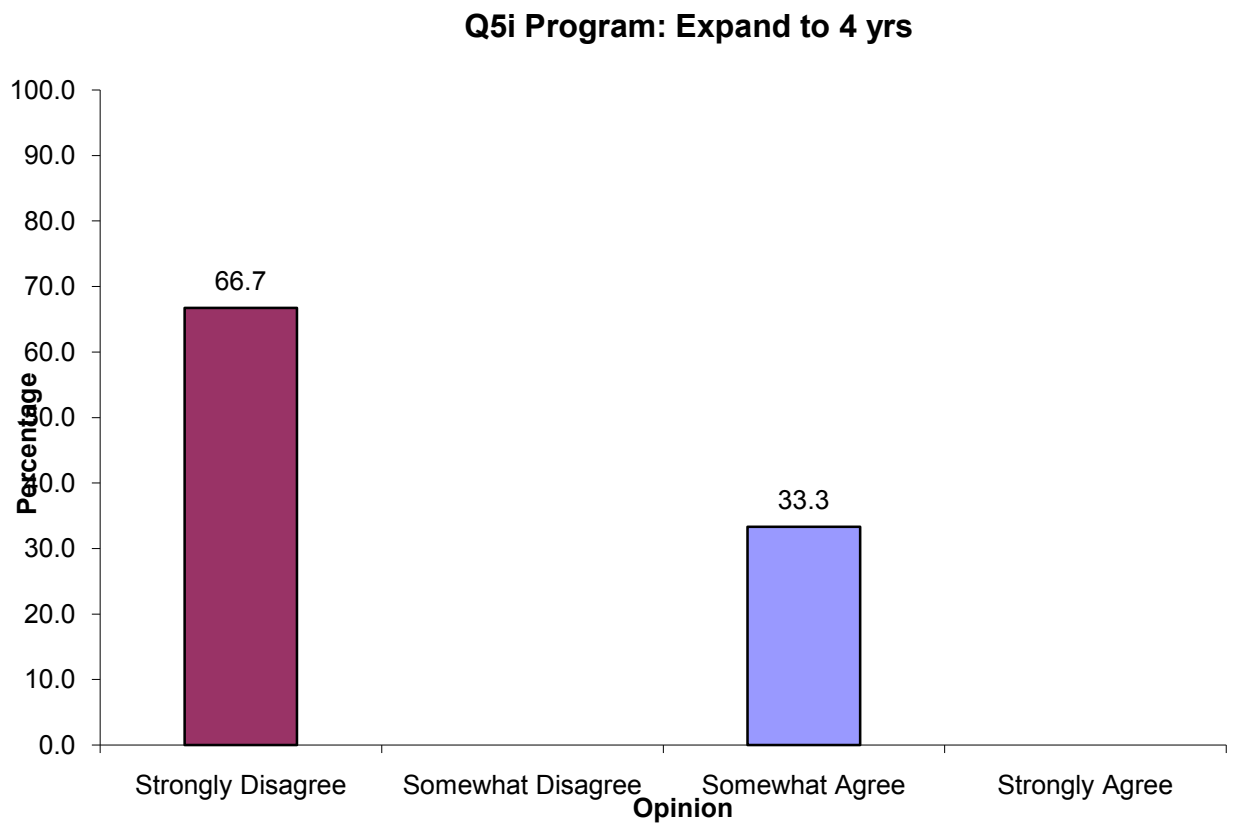

Q4m Subject: Rapid Prototyping
Percentage
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
33.3
66.7
Not Important
Slightly Emphasized
Somewhat Emphasized
Greatly Emphasized
Opinion

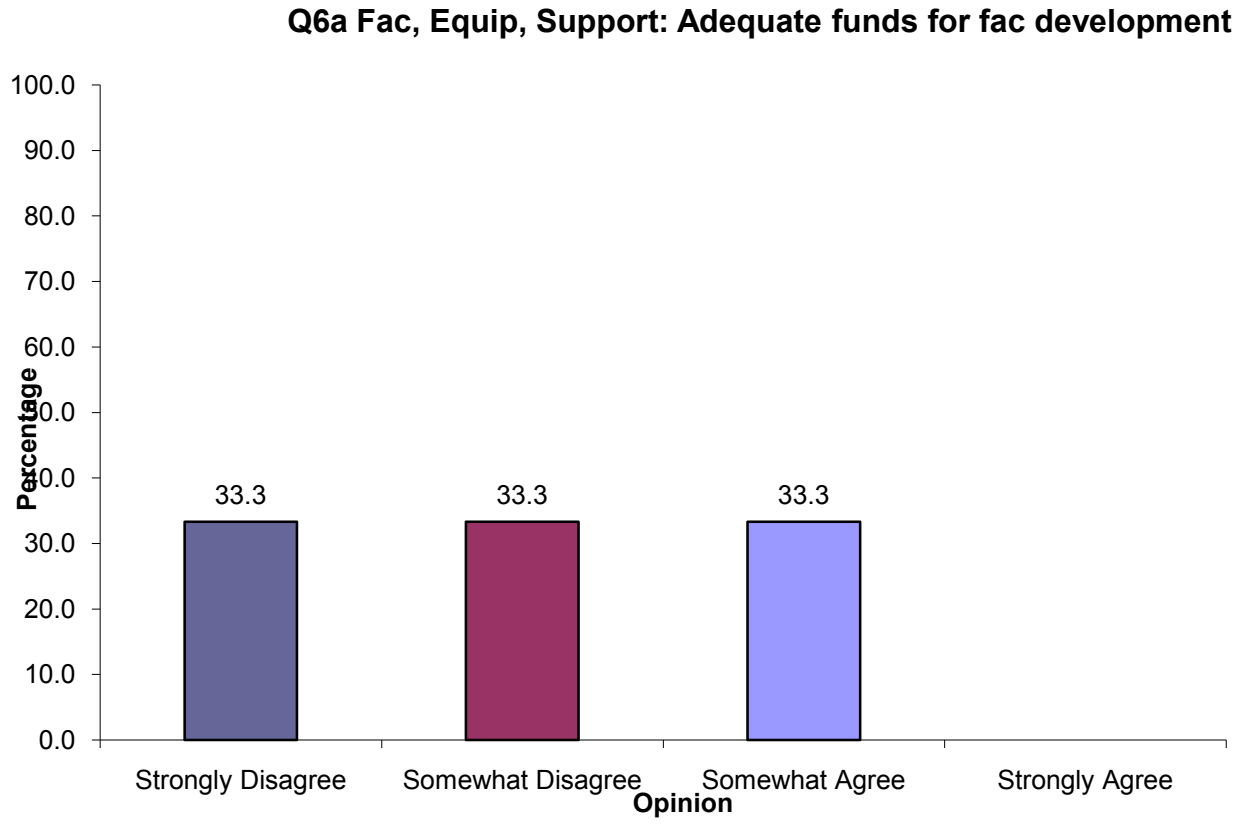

Q4n Subject: Rapid Tooling
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Percentage
33.3
66.7
Not Important
Slightly Emphasized
Somewhat Emphasized
Greatly Emphasized
Opinion


Q5a Program: 1 inst/course
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Percentage
33.3
66.7
Strongly Disagree
Somewhat Disagree
Somewhat Agree
Strongly Agree
Opinion

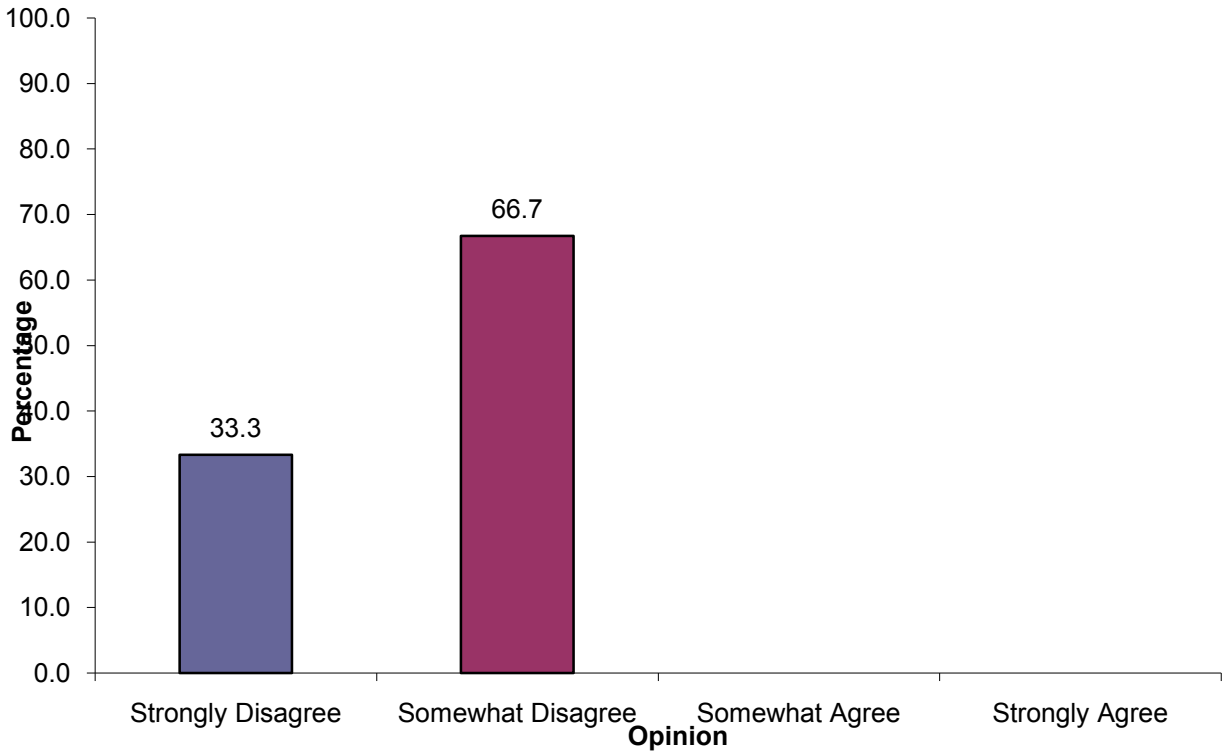

Q5d Program: Operate year-round
100
90
80
70
60
50
40
30
20
10
0
Percentage
33.3
33.3
33.3
Strongly Disagree
Somewhat Disagree
Somewhat Agree
Strongly Agree
Opinion


Q5e Program: Certifying skills
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Percentage
33.3
33.3
33.3
Strongly Disagree
Somewhat Disagree
Somewhat Agree
Strongly Agree
Opinion

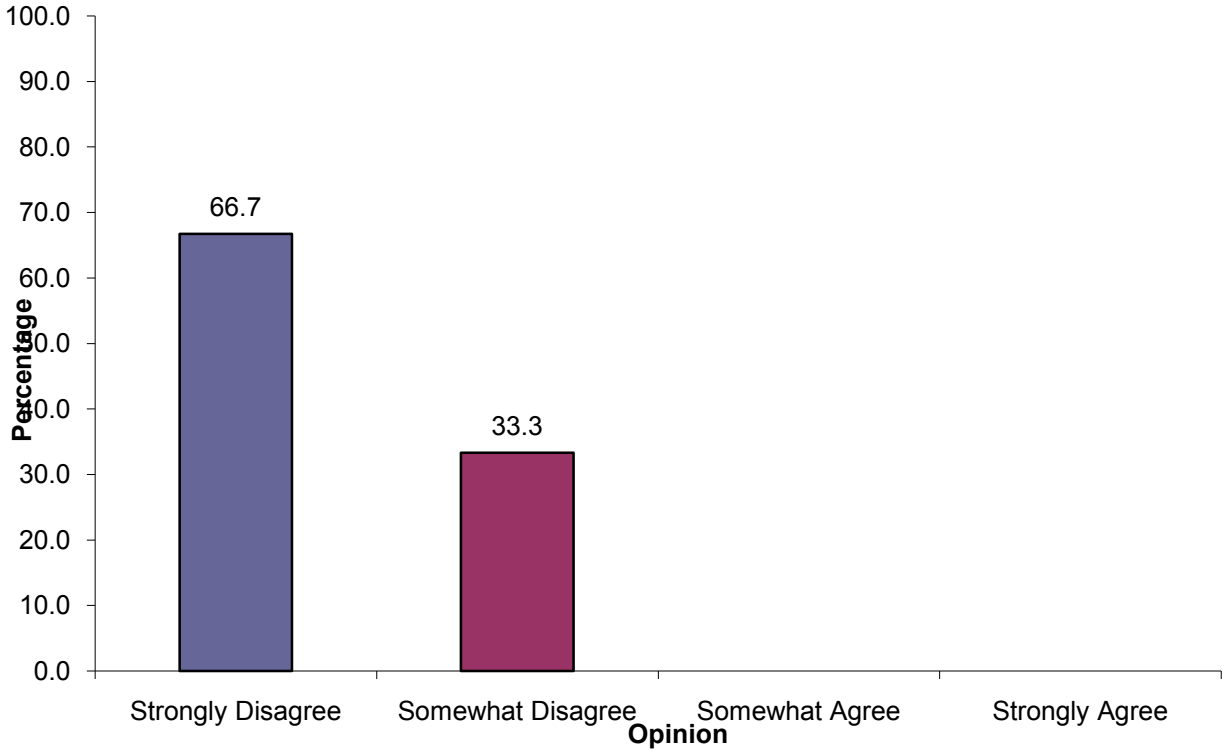

Q5i Program: Expand to 4 yrs
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Percentage
66.7
33.3
Strongly Disagree
Somewhat Disagree
Somewhat Agree
Strongly Agree
Opinion


Q6a Fac, Equip, Support: Adequate funds for fac development
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Percentage
33.3
33.3
33.3
Strongly Disagree
Somewhat Disagree
Somewhat Agree
Strongly Agree
Opinion

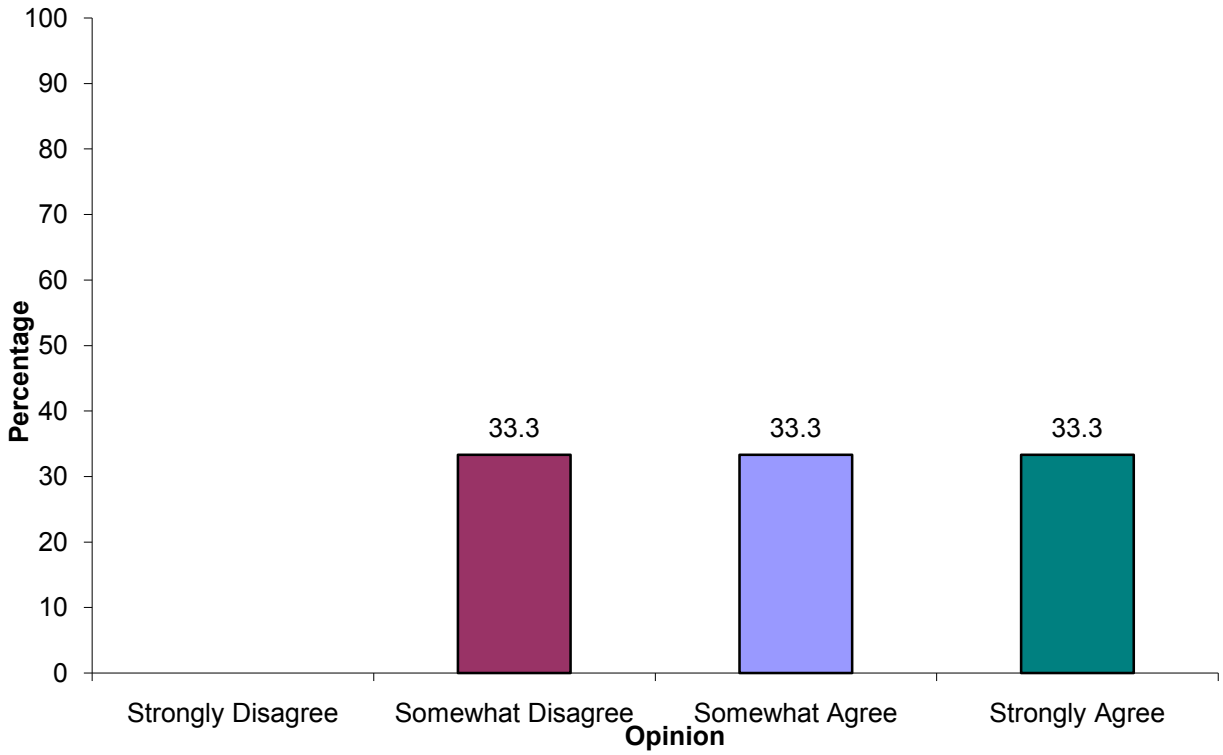
Q6b Fac, Equip, Support: Adequate leadership



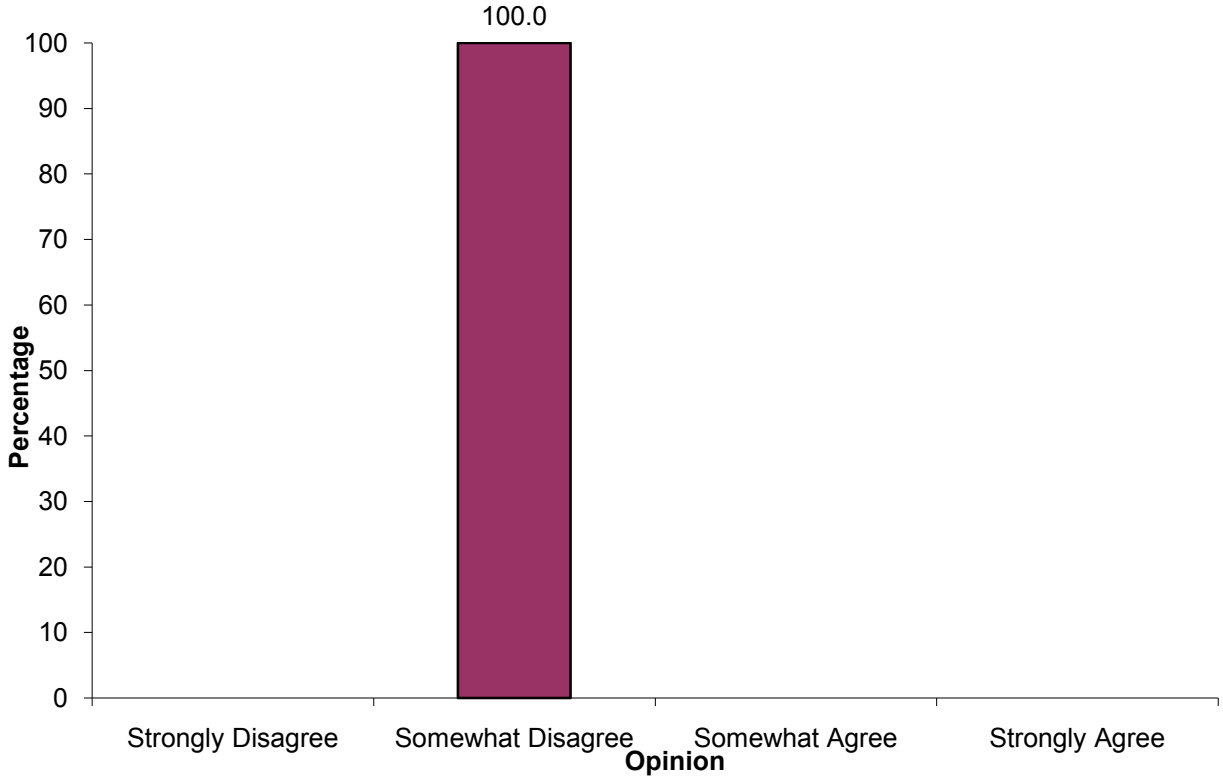
Q6d Fac, Equip, Support: Adequate funds for equipmt/supplies

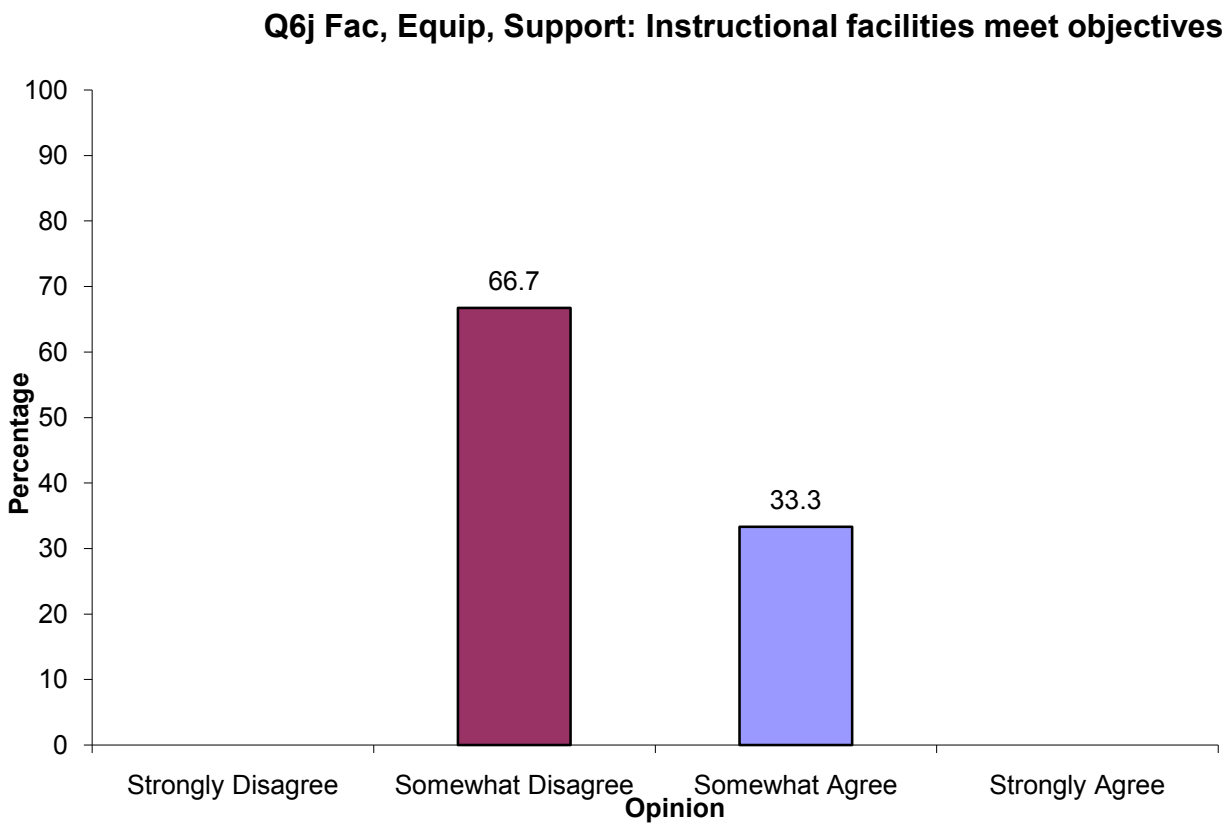


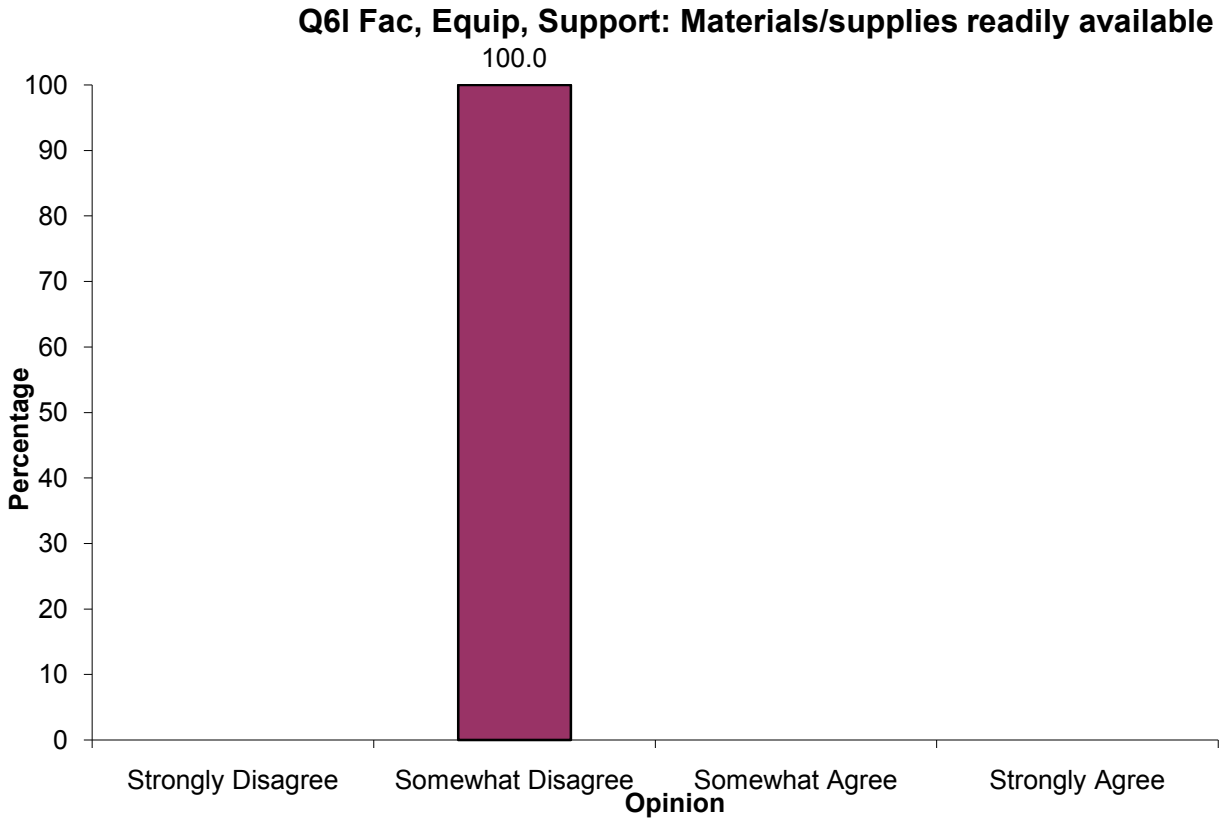
Q6g Fac, Equip, Support: Office/clerical assistance available

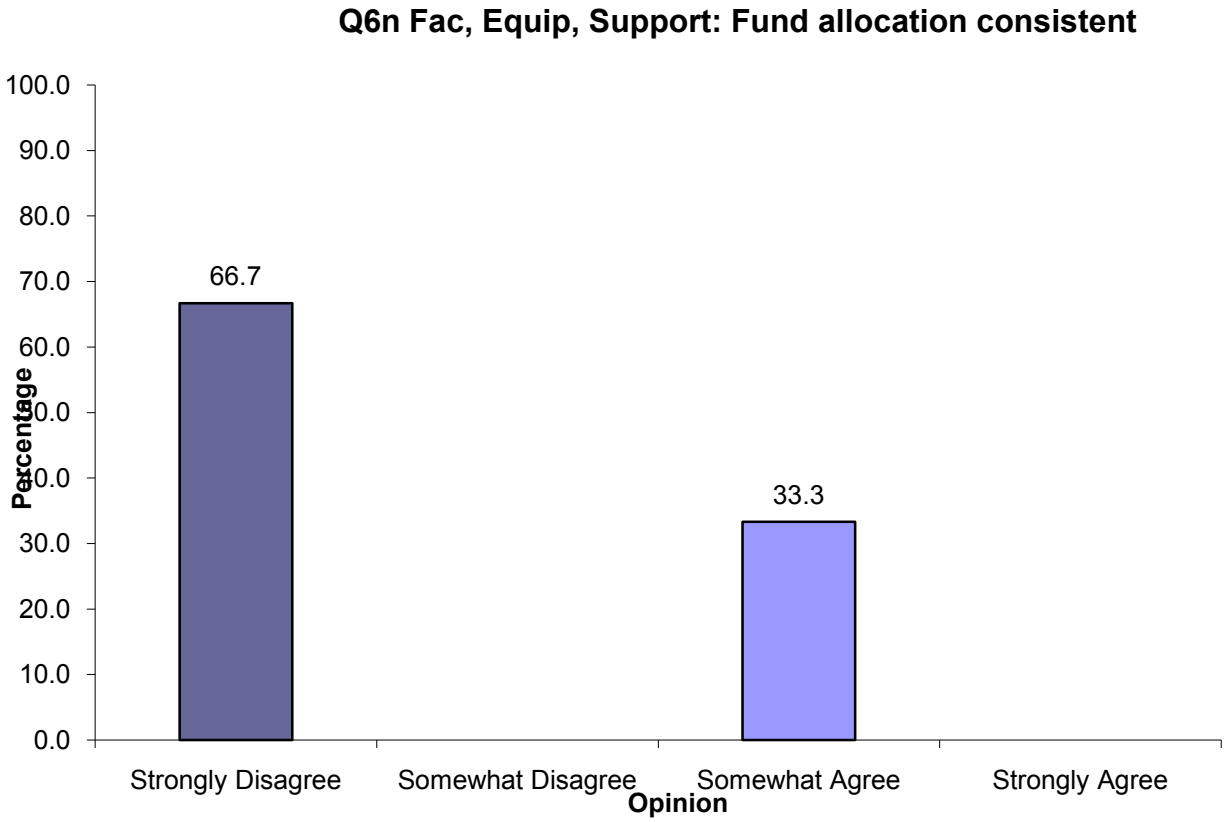


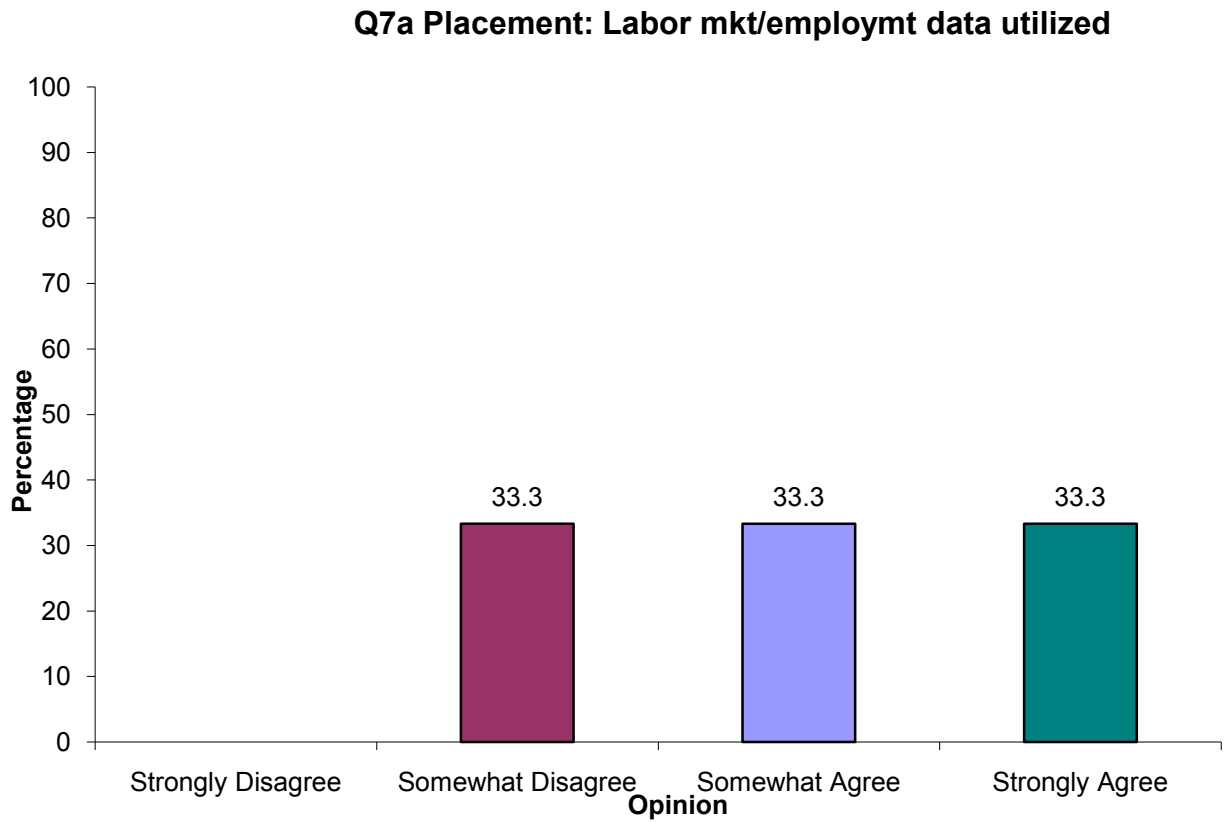
Q6h Fac, Equip, Support: Equipmt in adequate supply

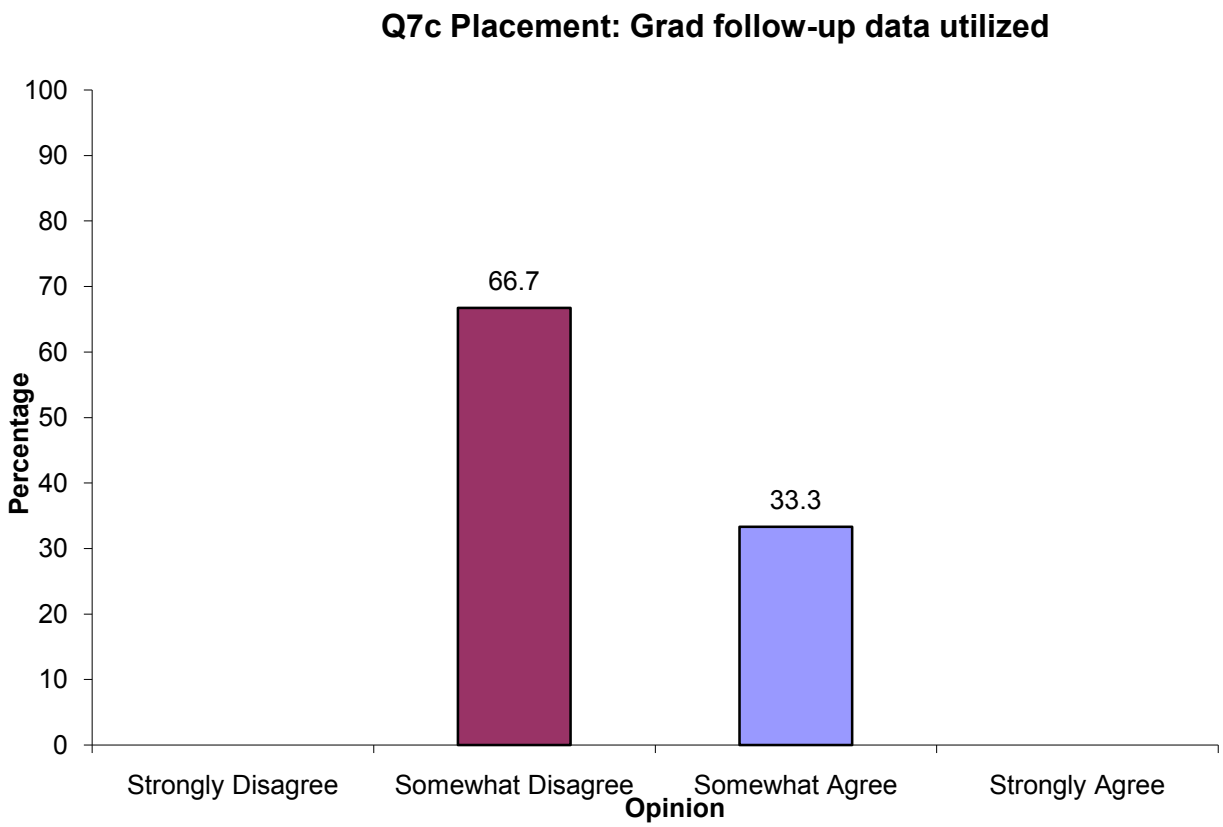



Q6j Fac, Equip, Support: Instructional facilities meet objectives
100
90
80
70
60
50
40
30
20
10
0
Percentage
66.7
33.3
Strongly Disagree
Somewhat Disagree
Somewhat Agree
Strongly Agree
Opinion


Q6l Fac, Equip, Support: Materials/supplies readily available
100.0
100
90
80
70
60
50
40
30
20
10
0
Percentage
Strongly Disagree
Somewhat Disagree
Somewhat Agree
Strongly Agree
Opinion


Q6n Fac, Equip, Support: Fund allocation consistent
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Percentage
66.7
33.3
Strongly Disagree
Somewhat Disagree
Somewhat Agree
Strongly Agree
Opinion


Q7a Placement: Labor mkt/employmt data utilized
100
90
80
70
60
50
40
30
20
10
0
Percentage
33.3
33.3
33.3
Strongly Disagree
Somewhat Disagree
Somewhat Agree
Strongly Agree
Opinion


Q7c Placement: Grad follow-up data utilized
100
90
80
70
60
50
40
30
20
10
0
Percentage
66.7
33.3
Strongly Disagree
Somewhat Disagree
Somewhat Agree
Strongly Agree
Opinion

CDTD APR...Faculty

Frequencies

Prepared by: Institutional Research & Testing, 02/09

Statistics

	N		Mean	Median	Std. Deviation
	Valid	Missing	Valid	Missing	Valid
q1a Written communication	3	0	3.00	3.00	.000
q1b Verbal communication	3	0	3.33	3.00	.577
q1c Quantitative	3	0	3.00	3.00	1.000
q1d Problem-solving	3	0	3.00	3.00	.000
q1e Time management	3	0	2.67	3.00	.577
q1f Individual project management	3	0	3.00	3.00	.000
q2a Geometrical Construction	3	0	3.00	3.00	.000
q2b Orthographic Projection	3	0	3.33	3.00	.577
q2c Sketching	3	0	3.33	3.00	.577
q2d Sectioning	3	0	2.67	3.00	.577
q2e Auxiliary Views	3	0	2.33	2.00	.577
q2f Dimensioning	3	0	2.33	2.00	.577
q2g Assemblies	3	0	3.33	3.00	.577
q2h Descriptive Geometry	3	0	2.00	2.00	1.000
q2i Development of Solid Models	3	0	3.67	4.00	.577
q3a CAD Solid Models	3	0	3.00	3.00	.000
q3b Parametric Models	3	0	3.00	3.00	.000
q3c Rapid Prototyping	3	0	2.00	2.00	.000
q3d CAE Statics & Strengths	3	0	1.67	1.00	1.155
q3e CAE Kinematics	3	0	2.33	3.00	1.155
q3f CAE Moldfill	3	0	2.33	2.00	.577
q3g GD&T	3	0	3.00	3.00	.000
q3h Other	1	2	1.00	1.00	
q3i Please Specify:	3	0			
q4a Sketching	3	0	3.67	4.00	.577
q4b Surfacing in CAD	3	0	3.33	3.00	.577
q4c Mold Design	3	0	4.00	4.00	.000
q4d Die Design	3	0	3.67	4.00	.577
q4e Jig. Fixture, Gage Design	3	0	3.33	4.00	1.155
q4f Special Machines	3	0	2.33	2.00	1.528
q4g Product Design	3	0	3.67	4.00	.577
q4h Dimensioning, Tolerances, GD&T	3	0	4.00	4.00	.000
q4i CAE Die Simulation	3	0	3.00	3.00	1.000
q4j AutoCAD 2D	3	0	1.33	1.00	.577
q4k Solid Modeling	3	0	4.00	4.00	.000
q4l Parametric Technology	3	0	4.00	4.00	.000
q4m Rapid Prototyping	3	0	2.33	3.00	1.155

q4n Rapid Tooling	*3*	*0*	*1.67*	*2.00*	*.577*
q4o Machine Tool Operations	*3*	*0*	*2.67*	*3.00*	*.577*
q4p Tool Building	*3*	*0*	*2.33*	*2.00*	*.577*
q4q Tool Path (CAM)	*3*	*0*	*3.67*	*4.00*	*.577*
q4r CMM	*3*	*0*	*2.00*	*2.00*	*.000*
q4s Laser Measuring	*3*	*0*	*1.67*	*2.00*	*.577*
q4t Reverse Engineering	*3*	*0*	*2.33*	*2.00*	*.577*
q4u Other	*1*	*2*	*3.00*	*3.00*	
q4v Please Specify:	*3*	*0*			
q5a 1 instructor per course	*3*	*0*	*3.00*	*4.00*	*1.732*
q5b 1 for lect, 1 for lab	*3*	*0*	*1.00*	*1.00*	*.000*
q5c 2 entry points (Fall & Spring)	*3*	*0*	*2.67*	*3.00*	*.577*
q5d Operate year-round	*3*	*0*	*3.00*	*3.00*	*1.000*
q5e Involved with certifying various skills	*3*	*0*	*2.67*	*3.00*	*1.528*
q5f Too many classes offered	*3*	*0*	*1.67*	*1.00*	*1.155*
q5g Applicable supportive courses are relevant	*3*	*0*	*3.00*	*3.00*	*.000*
q5h Student to faculty ratio is sufficient	*3*	*0*	*3.00*	*3.00*	*.000*
q5i Program should be expanded to four years	*3*	*0*	*1.67*	*1.00*	*1.155*
q6a Faculty has access to adequate funds	*3*	*0*	*2.00*	*2.00*	*1.000*
q6b Program has adequate leadership	*3*	*0*	*1.67*	*2.00*	*.577*
q6c Adv board has adequate input & influence	*3*	*0*	*3.67*	*4.00*	*.577*
q6d Adequate funds for equipment & supplies	*3*	*0*	*1.33*	*1.00*	*.577*
q6e Computer labs have adequate hardware	*3*	*0*	*2.33*	*2.00*	*.577*
q6f Aides & lab assistants are available	*3*	*0*	*3.33*	*3.00*	*.577*
q6g Office & clerical assistance is available	*3*	*0*	*3.00*	*3.00*	*1.000*
q6h Equipment is in adequate supply	*3*	*0*	*2.00*	*2.00*	*.000*
q6i Equipment is operational, safe & well-maintained	*3*	*0*	*2.67*	*3.00*	*.577*
q6j Instructional facilities meet objectives	*3*	*0*	*2.33*	*2.00*	*.577*
q6k Scheduling planned & consistent	*3*	*0*	*2.67*	*3.00*	*.577*
q6l Materials & supplies are readily available	*3*	*0*	*2.00*	*2.00*	*.000*
q6m Adequate funds are available for new equipmt/repair	*3*	*0*	*1.33*	*1.00*	*.577*
q6n Fund allocation is consistent	*3*	*0*	*1.67*	*1.00*	*1.155*
q6o Number of students assigned to advisor is manageable	*3*	*0*	*3.33*	*3.00*	*.577*
q7a Current labor mkt data systematically utilized	*3*	*0*	*3.00*	*3.00*	*1.000*
q7b Current job skills & trends systematically utilized	*3*	*0*	*3.33*	*3.00*	*.577*
q7c Current grad follow-up data systematically utilized	*3*	*0*	*2.33*	*2.00*	*.577*
q7d Curriculum is relevant once enter workforce	*3*	*0*	*4.00*	*4.00*	*.000*
q7e University has effective job placement	*3*	*0*	*2.67*	*3.00*	*.577*
q8 Changes	*3*	*0*			
q9 Additional comments	*3*	*0*			

Frequency Table

q1a Written communication

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Satisfied	*3*	*100.0*	*100.0*	*100.0*

q1b Verbal communication

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Satisfied	*2*	*66.7*	*66.7*	*66.7*
	Very Satisfied	*1*	*33.3*	*33.3*	*100.0*
	Total	*3*	*100.0*	*100.0*	

q1c Quantitative

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Dissatisfied	*1*	*33.3*	*33.3*	*33.3*
	Somewhat Satisfied	*1*	*33.3*	*33.3*	*66.7*
	Very Satisfied	*1*	*33.3*	*33.3*	*100.0*
	Total	*3*	*100.0*	*100.0*	

q1d Problem-solving

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Satisfied	*3*	*100.0*	*100.0*	*100.0*

q1e Time management

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Dissatisfied	*1*	*33.3*	*33.3*	*33.3*
	Somewhat Satisfied	*2*	*66.7*	*66.7*	*100.0*
	Total	*3*	*100.0*	*100.0*	

q1f Individual project management

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Satisfied	*3*	*100.0*	*100.0*	*100.0*

q2a Geometrical Construction

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	3	100.0	100.0	100.0

q2b Orthographic Projection

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	2	66.7	66.7	66.7
	Strongly Agree	1	33.3	33.3	100.0
	Total	3	100.0	100.0	

q2c Sketching

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	2	66.7	66.7	66.7
	Strongly Agree	1	33.3	33.3	100.0
	Total	3	100.0	100.0	

q2d Sectioning

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	1	33.3	33.3	33.3
	Somewhat Agree	2	66.7	66.7	100.0
	Total	3	100.0	100.0	

q2e Auxiliary Views

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	2	66.7	66.7	66.7
	Somewhat Agree	1	33.3	33.3	100.0
	Total	3	100.0	100.0	

q2f Dimensioning

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	2	66.7	66.7	66.7

	Somewhat Agree	*1*	*33.3*	*33.3*	*100.0*
	Total	*3*	*100.0*	*100.0*	

q2g Assemblies

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	*2*	*66.7*	*66.7*	*66.7*
	Strongly Agree	*1*	*33.3*	*33.3*	*100.0*
	Total	*3*	*100.0*	*100.0*	

q2h Descriptive Geometry

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	*1*	*33.3*	*33.3*	*33.3*
	Somewhat Disagree	*1*	*33.3*	*33.3*	*66.7*
	Somewhat Agree	*1*	*33.3*	*33.3*	*100.0*
	Total	*3*	*100.0*	*100.0*	

q2i Development of Solid Models

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	*1*	*33.3*	*33.3*	*33.3*
	Strongly Agree	*2*	*66.7*	*66.7*	*100.0*
	Total	*3*	*100.0*	*100.0*	

q3a CAD Solid Models

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Important	*3*	*100.0*	*100.0*	*100.0*

q3b Parametric Models

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Important	*3*	*100.0*	*100.0*	*100.0*

q3c Rapid Prototyping

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Important	3	100.0	100.0	100.0

q3d CAE Statics & Strengths

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Important	2	66.7	66.7	66.7
	Very Important	1	33.3	33.3	100.0
	Total	3	100.0	100.0	

q3e CAE Kinematics

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Important	1	33.3	33.3	33.3
	Very Important	2	66.7	66.7	100.0
	Total	3	100.0	100.0	

q3f CAE Moldfill

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Important	2	66.7	66.7	66.7
	Very Important	1	33.3	33.3	100.0
	Total	3	100.0	100.0	

q3g GD&T

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Important	3	100.0	100.0	100.0

q3h Other

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Important	1	33.3	100.0	100.0
Missing	System	2	66.7		
Total		3	100.0		

q3i Please Specify:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		2	66.7	66.7	66.7
	There are some CAD topics more important that the topics in the CAE class.	1	33.3	33.3	100.0
	Total	3	100.0	100.0	

q4a Sketching

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Emphasized	1	33.3	33.3	33.3
	Greatly Emphasized	2	66.7	66.7	100.0
	Total	3	100.0	100.0	

q4b Surfacing in CAD

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Emphasized	2	66.7	66.7	66.7
	Greatly Emphasized	1	33.3	33.3	100.0
	Total	3	100.0	100.0	

q4c Mold Design

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Greatly Emphasized	3	100.0	100.0	100.0

q4d Die Design

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Emphasized	1	33.3	33.3	33.3
	Greatly Emphasized	2	66.7	66.7	100.0
	Total	3	100.0	100.0	

q4e Jig. Fixture, Gage Design

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Slightly Emphasized	1	33.3	33.3	33.3
	Greatly Emphasized	2	66.7	66.7	100.0
	Total	3	100.0	100.0	

q4f Special Machines

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Important	1	33.3	33.3	33.3
	Slightly Emphasized	1	33.3	33.3	66.7
	Greatly Emphasized	1	33.3	33.3	100.0
	Total	3	100.0	100.0	

q4g Product Design

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Emphasized	1	33.3	33.3	33.3
	Greatly Emphasized	2	66.7	66.7	100.0
	Total	3	100.0	100.0	

q4h Dimensioning, Tolerances, GD&T

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Greatly Emphasized	3	100.0	100.0	100.0

q4i CAE Die Simulation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Slightly Emphasized	1	33.3	33.3	33.3
	Somewhat Emphasized	1	33.3	33.3	66.7
	Greatly Emphasized	1	33.3	33.3	100.0
	Total	3	100.0	100.0	

q4j AutoCAD 2D

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Important	2	66.7	66.7	66.7
	Slightly Emphasized	1	33.3	33.3	100.0
	Total	3	100.0	100.0	

q4k Solid Modeling

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Greatly Emphasized	3	100.0	100.0	100.0

q4l Parametric Technology

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Greatly Emphasized	3	100.0	100.0	100.0

q4m Rapid Prototyping

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Important	1	33.3	33.3	33.3
	Somewhat Emphasized	2	66.7	66.7	100.0
	Total	3	100.0	100.0	

q4n Rapid Tooling

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Important	1	33.3	33.3	33.3
	Slightly Emphasized	2	66.7	66.7	100.0
	Total	3	100.0	100.0	

q4o Machine Tool Operations

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Slightly Emphasized	1	33.3	33.3	33.3
	Somewhat Emphasized	2	66.7	66.7	100.0
	Total	3	100.0	100.0	

q4p Tool Building

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Slightly Emphasized	2	66.7	66.7	66.7
	Somewhat Emphasized	1	33.3	33.3	100.0
	Total	3	100.0	100.0	

q4q Tool Path (CAM)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Emphasized	1	33.3	33.3	33.3
	Greatly Emphasized	2	66.7	66.7	100.0
	Total	3	100.0	100.0	

q4r CMM

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Slightly Emphasized	3	100.0	100.0	100.0

q4s Laser Measuring

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Important	1	33.3	33.3	33.3
	Slightly Emphasized	2	66.7	66.7	100.0
	Total	3	100.0	100.0	

q4t Reverse Engineering

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Slightly Emphasized	2	66.7	66.7	66.7
	Somewhat Emphasized	1	33.3	33.3	100.0
	Total	3	100.0	100.0	

q4u Other

	Frequency	Percent	Valid Percent	Cumulative Percent

Valid	Somewhat Emphasized	1	33.3	100.0	100.0
Missing	System	2	66.7		
Total		3	100.0		

q4v Please Specify:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		2	66.7	66.7	66.7
	Project Management	1	33.3	33.3	100.0
	Total	3	100.0	100.0	

q5a 1 instructor per course

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	33.3	33.3	33.3
	Strongly Agree	2	66.7	66.7	100.0
	Total	3	100.0	100.0	

q5b 1 for lect, 1 for lab

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	100.0	100.0	100.0

q5c 2 entry points (Fall & Spring)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	1	33.3	33.3	33.3
	Somewhat Agree	2	66.7	66.7	100.0
	Total	3	100.0	100.0	

q5d Operate year-round

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	1	33.3	33.3	33.3
	Somewhat Agree	1	33.3	33.3	66.7
	Strongly Agree	1	33.3	33.3	100.0
	Total	3	100.0	100.0	

q5e Involved with certifying various skills

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	33.3	33.3	33.3
	Somewhat Agree	1	33.3	33.3	66.7
	Strongly Agree	1	33.3	33.3	100.0
	Total	3	100.0	100.0	

q5f Too many classes offered

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	66.7	66.7	66.7
	Somewhat Agree	1	33.3	33.3	100.0
	Total	3	100.0	100.0	

q5g Applicable supportive courses are relevant

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	3	100.0	100.0	100.0

q5h Student to faculty ratio is sufficient

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	3	100.0	100.0	100.0

q5i Program should be expanded to four years

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	66.7	66.7	66.7
	Somewhat Agree	1	33.3	33.3	100.0
	Total	3	100.0	100.0	

q6a Faculty has access to adequate funds

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	33.3	33.3	33.3

	Somewhat Disagree	*1*	*33.3*	*33.3*	*66.7*
	Somewhat Agree	*1*	*33.3*	*33.3*	*100.0*
	Total	*3*	*100.0*	*100.0*	

q6b Program has adequate leadership

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	*1*	*33.3*	*33.3*	*33.3*
	Somewhat Disagree	*2*	*66.7*	*66.7*	*100.0*
	Total	*3*	*100.0*	*100.0*	

q6c Adv board has adequate input & influence

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	*1*	*33.3*	*33.3*	*33.3*
	Strongly Agree	*2*	*66.7*	*66.7*	*100.0*
	Total	*3*	*100.0*	*100.0*	

q6d Adequate funds for equipment & supplies

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	*2*	*66.7*	*66.7*	*66.7*
	Somewhat Disagree	*1*	*33.3*	*33.3*	*100.0*
	Total	*3*	*100.0*	*100.0*	

q6e Computer labs have adequate hardware

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	*2*	*66.7*	*66.7*	*66.7*
	Somewhat Agree	*1*	*33.3*	*33.3*	*100.0*
	Total	*3*	*100.0*	*100.0*	

q6f Aides & lab assistants are available

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	*2*	*66.7*	*66.7*	*66.7*
	Strongly Agree	*1*	*33.3*	*33.3*	*100.0*
	Total	*3*	*100.0*	*100.0*	

q6g Office & clerical assistance is available

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	1	33.3	33.3	33.3
	Somewhat Agree	1	33.3	33.3	66.7
	Strongly Agree	1	33.3	33.3	100.0
	Total	3	100.0	100.0	

q6h Equipment is in adequate supply

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	3	100.0	100.0	100.0

q6i Equipment is operational, safe & well-maintained

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	1	33.3	33.3	33.3
	Somewhat Agree	2	66.7	66.7	100.0
	Total	3	100.0	100.0	

q6j Instructional facilities meet objectives

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	2	66.7	66.7	66.7
	Somewhat Agree	1	33.3	33.3	100.0
	Total	3	100.0	100.0	

q6k Scheduling planned & consistent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	1	33.3	33.3	33.3
	Somewhat Agree	2	66.7	66.7	100.0
	Total	3	100.0	100.0	

q6l Materials & supplies are readily available

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	*3*	*100.0*	*100.0*	*100.0*

q6m Adequate funds are available for new equipment/repair

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	*2*	*66.7*	*66.7*	*66.7*
	Somewhat Disagree	*1*	*33.3*	*33.3*	*100.0*
	Total	*3*	*100.0*	*100.0*	

q6n Fund allocation is consistent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	*2*	*66.7*	*66.7*	*66.7*
	Somewhat Agree	*1*	*33.3*	*33.3*	*100.0*
	Total	*3*	*100.0*	*100.0*	

q6o Number of students assigned to advisor is manageable

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	*2*	*66.7*	*66.7*	*66.7*
	Strongly Agree	*1*	*33.3*	*33.3*	*100.0*
	Total	*3*	*100.0*	*100.0*	

q7a Current labor mkt data systematically utilized

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	*1*	*33.3*	*33.3*	*33.3*
	Somewhat Agree	*1*	*33.3*	*33.3*	*66.7*
	Strongly Agree	*1*	*33.3*	*33.3*	*100.0*
	Total	*3*	*100.0*	*100.0*	

q7b Current job skills & trends systematically utilized

	Frequency	Percent	Valid Percent	Cumulative Percent

Valid	Somewhat Agree	*2*	*66.7*	*66.7*	*66.7*
	Strongly Agree	*1*	*33.3*	*33.3*	*100.0*
	Total	*3*	*100.0*	*100.0*	

q7c Current grad follow-up data systematically utilized

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	*2*	*66.7*	*66.7*	*66.7*
	Somewhat Agree	*1*	*33.3*	*33.3*	*100.0*
	Total	*3*	*100.0*	*100.0*	

q7d Curriculum is relevant once enter workforce

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	*3*	*100.0*	*100.0*	*100.0*

q7e University has effective job placement

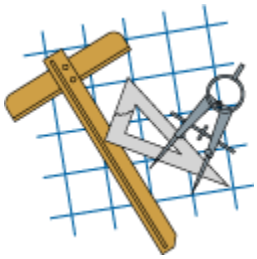
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	*1*	*33.3*	*33.3*	*33.3*
	Somewhat Agree	*2*	*66.7*	*66.7*	*100.0*
	Total	*3*	*100.0*	*100.0*	

q8 Changes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I would require our students to have an internship/externship preferably the summer between their freshman and sophmore years. I would also like to develop our second year computer lab to have high end computers that adequately run high end software. We also need to develop more cross curriculum relationships and student centered/driven projects. We also need to seek funding to have a reasonable budget to work with that will assist us in planning program specific needs so we can stay ahead of the curve.	*1*	*33.3*	*33.3*	*33.3*
	Swan 502 needs better chairs and tables. The room was undated but not completed. Need cabinents installed in back of room also.	*1*	*33.3*	*33.3*	*66.7*
	The program needs an entire review of curriculum and its objectives. Some material can be added to other classes, while adding new classes that are more relavent.	*1*	*33.3*	*33.3*	*100.0*
	Total	*3*	*100.0*	*100.0*	

q9 Additional comments

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		*2*	*66.7*	*66.7*	*66.7*
	The computer configuration CPU speed, RAM amounts are not sufficient for proper CAD operation. This topic has been raised for years with no action plan to solve the issue.	*1*	*33.3*	*33.3*	*100.0*
	Total	*3*	*100.0*	*100.0*	



2F. Advisory committee perceptions: The purpose of this survey is to obtain information from the members of the program advisory committee regarding the curriculum, outcomes, facilities, equipment, graduates, micro- and megatrends that might affect job placement (both positively and adversely), and other relevant information. Recommendations for improvement must be sought from this group. In the event that a program does not have an advisory committee, a group of individuals may be identified to serve in that capacity on a temporary basis.

SECTION 2-F

Advisory Committee Perceptions

SUMMARY OF SURVEY RESULTS

Of 16 members of the advisory 4 surveys were returned due to incorrect address. Of the remaining 12 members 6 completed the entire survey giving us a 50% return rate. The respondents of the advisory committee indicated that overall we have an extremely well-rounded program, with dedicated instructors, and graduates that are very prepared for working in the tooling industry.

As indicated by the survey results the advisory committee as a whole felt that their suggestions given in advisory committee meetings are valued and implemented by the faculty. They indicated that the amount of times that we meet is about average and they are being utilized adequately. They all felt strongly that there continues to be strong potential for long-term employment in the tooling industry.

All course objectives and subject area skills listed on the survey were indicated to have a high emphasis placed on them with the exceptions of the following. There was a split on the level of importance of detailing and dimensioning. It was indicated that the reasoning for not emphasizing this area was due to the major impact and changes that solid modeling has done to the industry. The reason given for emphasizing this area was that it proves the true understanding of manufacturability. Other items that were given a very low level of importance were board drafting, use of software design wizards, and virtual reality.

The advisory board indicated on the survey that the most widely used and critical software to use would be Unigraphics/SolidEdge followed by Solidworks.

There was also a very high level of importance given to the soft skills (verbal, written, planning, etc.) that our students are expected to know when entering this field. This needs to be emphasized and continued to be incorporated into student projects.

Several comments were listed that this program could be a four year degree. The tooling industry has changed drastically over the past ten years and entry level requirements continue to increase. It is very ironic that on our student survey they indicate that there is too much work while the advisory committee would like them to be exposed to a wide range of topics. The advisory board also indicated that it is good that students have a broad understanding of design standards with some of the basics not being quite as critical as they have been in years past.

CDTD APR...Advisory Committee

Frequencies

Prepared by: Institutional Research & Testing, 06/09

Statistics

	N		Mean	Median	Std. Deviation
	Valid	Missing	Valid	Missing	Valid
q1a The Advisory Committee meets often enough	6	0	3.33	3.50	.816
q1b The Advisory Committee members are adequately utilized	6	0	3.50	3.50	1.049
q1c Suggestions are encouraged/adopted	6	0	4.17	4.00	.753
q1d Advisory Committee input is of value	6	0	4.00	4.50	1.265
q1e Long-term employment opportunities remain strong in the tool design field	5	1	4.40	4.00	.548
q2 Elaborate on responses for Q1	6	0			
q3 Importance of tool detailing in the Tool Design industry	5	1	2.20	3.00	1.095
q4 Elaborate on responses for Q3	6	0			
q5 Percent of design work in solid modeling	6	0	5.50	6.00	.837
q6a Emphasis: Drafting Standards	6	0	2.83	3.00	.408
q6b Emphasis: Geometric Construction	6	0	2.50	2.50	.548
q6c Emphasis: Orthographic Projection	6	0	2.33	2.00	.516
q6d Emphasis: Sketching	6	0	2.50	2.50	.548
q6e Emphasis: Use of drawing tools when sketching	5	1	2.20	2.00	.447
q6f Emphasis: Sectioning	6	0	2.33	2.00	.516
q6g Emphasis: Auxiliary Views	6	0	2.17	2.00	.408
q6h Emphasis: Dimensioning	6	0	2.50	2.50	.548
q6i Emphasis: Assemblies	6	0	2.83	3.00	.408
q6j Emphasis: Bill of Materials	6	0	2.33	2.00	.516
q6k Emphasis: Descriptive Geometry	5	1	2.80	3.00	.447
q6l Emphasis: Geometric Dimensioning & Tolerancing	6	0	2.33	2.00	.516
q6m Emphasis: Other	1	5	3.00	3.00	
q6n Emphasis: Other specified	6	0			
q7 Elaborate on responses for Q6	6	0			
q8a Emphasize: Board Drafting	4	2	1.00	1.00	.000
q8b Emphasize: CAD Drafting (2-D)	3	3	2.00	2.00	1.000
q8c Emphasize: Mold Design	5	1	2.80	3.00	.447
q8d Emphasize: Die Design	5	1	2.80	3.00	.447
q8e Emphasize: Jig, Fixture, Gages	5	1	3.00	3.00	.000
q8f Emphasize: Tool Detailing	5	1	2.20	2.00	.837
q8g Emphasize: Product Detailing	5	1	2.60	3.00	.548
q8h Emphasize: Dimensioning	5	1	2.20	2.00	.837

q8i Emphasize: Geometric Dimensioning & Tolerancing (GD&T)	5	1	2.60	3.00	.548
q8j Emphasize: CAE-Moldflow	5	1	2.80	3.00	.447
q8k Emphasize: CAE-Forming/Die Simulation	5	1	2.80	3.00	.447
q8l Emphasize: CAE-Kinematics	5	1	2.60	3.00	.548
q8m Emphasize: Mold & Die Design software wizards	5	1	2.20	2.00	.837
q8n Emphasize: 3-D Models, w/ surfaces	5	1	2.40	2.00	.548
q8o Emphasize: Solid Modeling	6	0	3.00	3.00	.000
q8p Emphasize: Parametric Technology	6	0	3.00	3.00	.000
q8q Emphasize: Rapid Prototyping	6	0	2.50	2.50	.548
q8r Emphasize: Rapid Tooling	5	1	2.40	2.00	.548
q8s Emphasize: Machine Tool	5	1	3.00	3.00	.000
q8t Emphasize: Tool Building	5	1	3.00	3.00	.000
q8u Emphasize: Tool Path (CAM)	5	1	2.20	2.00	.837
q8v Emphasize: CMM-Part Inspection	5	1	2.20	2.00	.837
q8w Emphasize: Laser Measuring & Scanning	5	1	2.20	2.00	.837
q8x Emphasize: Virtual Reality	5	1	1.40	1.00	.548
q8y Emphasize: Product Development	6	0	2.50	2.50	.548
q8z Emphasize: Other	0	6			
q8aa Emphasize: Other specified	6	0			
q9 Elaborate on responses for Q8	6	0			
q10a Autodesk products	5	1	2.60	3.00	1.140
q10b CATIA	5	1	2.60	2.00	1.517
q10c Pro-Engineer	5	1	3.80	4.00	1.304
q10d Solidworks	5	1	2.20	2.00	1.095
q10e Unigraphics/Solid Edge	6	0	2.00	1.50	1.265
q11 Any other packages	6	0			
q12a Verbal communication	6	0	3.83	4.00	.408
q12b Written communication	6	0	3.83	4.00	.408
q12c Time management	6	0	4.00	4.00	.000
q12d Project planning	6	0	4.00	4.00	.000
q12e Presentation skills	6	0	3.50	4.00	.837
q13 Major strengths	6	0			
q14 Weaknesses	6	0			
q15 Changes you would make	6	0			
q16 How prepared grads are to enter field	6	0			
q17 Additional comments	6	0			

Frequency Table

q1a The Advisory Committee meets often enough

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	1	16.7	16.7	16.7
	Neutral	2	33.3	33.3	50.0

	Somewhat Agree	3	50.0	50.0	100.0
	Total	6	100.0	100.0	

q1b The Advisory Committee members are adequately utilized

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	1	16.7	16.7	16.7
	Neutral	2	33.3	33.3	50.0
	Somewhat Agree	2	33.3	33.3	83.3
	Strongly Agree	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q1c Suggestions are encouraged/adopted

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	1	16.7	16.7	16.7
	Somewhat Agree	3	50.0	50.0	66.7
	Strongly Agree	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q1d Advisory Committee input is of value

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	1	16.7	16.7	16.7
	Neutral	1	16.7	16.7	33.3
	Somewhat Agree	1	16.7	16.7	50.0
	Strongly Agree	3	50.0	50.0	100.0
	Total	6	100.0	100.0	

q1e Long-term employment opportunities remain strong in the tool design field

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	3	50.0	60.0	60.0
	Strongly Agree	2	33.3	40.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q2 Elaborate on responses for Q1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		3	50.0	50.0	50.0
	Do not work in the tool design industry.	1	16.7	16.7	66.7
	I've only met with the team/students once	1	16.7	16.7	83.3
	I am not able to comment on the advisoty committee as i was not able to attend last years meeting. It does seem however that if it meets once a year that you may not be utilizing feedback for future planning as much as you could for the program.	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q3 Importance of tool detailing in the Tool Design industry

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Important	2	33.3	40.0	40.0
	Very Important	3	50.0	60.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q4 Elaborate on responses for Q3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		2	33.3	33.3	33.3
	Even though we are in a 3d world, we still use drafting detailing to fabricate parts in the shop.	1	16.7	16.7	50.0
	Mostly all of the tool build is 3-D data driven. What is detailed could be tought in one 8 hour day.	1	16.7	16.7	66.7
	Solid modeling for design and manufacture is the greatest tool we have to compete against the world. All their 2d detailing is time consuming and slows the overall process, while driving defects and costs up.	1	16.7	16.7	83.3
	The understanding of detailing(which includes fits, geometric tolerancing, and the mechanical understanding of what the detail is to be used for and why certain decisions are made on material selection and surface finish requirements)is the fundamental starting place for any good designer or engineer. Regardless of schooling level when we hire a perpective employee, if directly out of school this is where the designer will start in our organization to be certain that they have the mechanical understanding required before advancing.	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q5 Percent of design work in solid modeling

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	80%	1	16.7	16.7	16.7
	90%	1	16.7	16.7	33.3
	100%	4	66.7	66.7	100.0
	Total	6	100.0	100.0	

q6a Emphasis: Drafting Standards

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Emphasize	1	16.7	16.7	16.7
	Greatly Emphasize	5	83.3	83.3	100.0
	Total	6	100.0	100.0	

q6b Emphasis: Geometric Construction

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Emphasize	3	50.0	50.0	50.0
	Greatly Emphasize	3	50.0	50.0	100.0
	Total	6	100.0	100.0	

q6c Emphasis: Orthographic Projection

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Emphasize	4	66.7	66.7	66.7
	Greatly Emphasize	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q6d Emphasis: Sketching

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Emphasize	3	50.0	50.0	50.0
	Greatly Emphasize	3	50.0	50.0	100.0
	Total	6	100.0	100.0	

q6e Emphasis: Use of drawing tools when sketching

	Frequency	Percent	Valid Percent	Cumulative Percent

Valid	Somewhat Emphasize	*4*	*66.7*	*80.0*	*80.0*
	Greatly Emphasize	*1*	*16.7*	*20.0*	*100.0*
	Total	*5*	*83.3*	*100.0*	
Missing	System	*1*	*16.7*		
Total		*6*	*100.0*		

q6f Emphasis: Sectioning

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Emphasize	*4*	*66.7*	*66.7*	*66.7*
	Greatly Emphasize	*2*	*33.3*	*33.3*	*100.0*
	Total	*6*	*100.0*	*100.0*	

q6g Emphasis: Auxiliary Views

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Emphasize	*5*	*83.3*	*83.3*	*83.3*
	Greatly Emphasize	*1*	*16.7*	*16.7*	*100.0*
	Total	*6*	*100.0*	*100.0*	

q6h Emphasis: Dimensioning

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Emphasize	*3*	*50.0*	*50.0*	*50.0*
	Greatly Emphasize	*3*	*50.0*	*50.0*	*100.0*
	Total	*6*	*100.0*	*100.0*	

q6i Emphasis: Assemblies

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Emphasize	*1*	*16.7*	*16.7*	*16.7*
	Greatly Emphasize	*5*	*83.3*	*83.3*	*100.0*
	Total	*6*	*100.0*	*100.0*	

q6j Emphasis: Bill of Materials

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Emphasize	*4*	*66.7*	*66.7*	*66.7*

	Greatly Emphasize	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q6k Emphasis: Descriptive Geometry

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Emphasize	1	16.7	20.0	20.0
	Greatly Emphasize	4	66.7	80.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q6l Emphasis: Geometric Dimensioning & Tolerancing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Emphasize	4	66.7	66.7	66.7
	Greatly Emphasize	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q6m Emphasis: Other

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Greatly Emphasize	1	16.7	100.0	100.0
Missing	System	5	83.3		
Total		6	100.0		

q6n Emphasis: Other specified

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		6	100.0	100.0	100.0

q7 Elaborate on responses for Q6

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		3	50.0	50.0	50.0
	3D has eliminated the need for in depth knowledge in constructing views from projection, etc.	1	16.7	16.7	66.7

	Being able to understand and communicate with the rest of the world utilizing 2d is important. Implementing it back into our system would be a HUGE mistake.	*1*	*16.7*	*16.7*	*83.3*
	Even though we are in the electronic era, the first commincation of thoughts or ideas has to start with a sketch. Sketching from a employers perspective is an absolute must as a cost and time saver. No matter what media we use, good drafting practices have to be taught. A thorough understanding of GD & T, and presentation is a must, and that includes the understanding of knowing when a specific section or view is needed for clarification.	*1*	*16.7*	*16.7*	*100.0*
	Total	*6*	*100.0*	*100.0*	

q8a Emphasize: Board Drafting

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Important	*4*	*66.7*	*100.0*	*100.0*
Missing	System	*2*	*33.3*		
Total		*6*	*100.0*		

q8b Emphasize: CAD Drafting (2-D)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Important	*1*	*16.7*	*33.3*	*33.3*
	Somewhat Emphasized	*1*	*16.7*	*33.3*	*66.7*
	Greatly Emphasized	*1*	*16.7*	*33.3*	*100.0*
	Total	*3*	*50.0*	*100.0*	
Missing	System	*3*	*50.0*		
Total		*6*	*100.0*		

q8c Emphasize: Mold Design

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Emphasized	*1*	*16.7*	*20.0*	*20.0*
	Greatly Emphasized	*4*	*66.7*	*80.0*	*100.0*
	Total	*5*	*83.3*	*100.0*	
Missing	System	*1*	*16.7*		
Total		*6*	*100.0*		

q8d Emphasize: Die Design

	Frequency	Percent	Valid Percent	Cumulative Percent

Valid	Somewhat Emphasized	1	16.7	20.0	20.0
	Greatly Emphasized	4	66.7	80.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q8e Emphasize: Jig, Fixture, Gages

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Greatly Emphasized	5	83.3	100.0	100.0
Missing	System	1	16.7		
Total		6	100.0		

q8f Emphasize: Tool Detailing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Important	1	16.7	20.0	20.0
	Somewhat Emphasized	2	33.3	40.0	60.0
	Greatly Emphasized	2	33.3	40.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q8g Emphasize: Product Detailing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Emphasized	2	33.3	40.0	40.0
	Greatly Emphasized	3	50.0	60.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q8h Emphasize: Dimensioning

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Important	1	16.7	20.0	20.0
	Somewhat Emphasized	2	33.3	40.0	60.0
	Greatly Emphasized	2	33.3	40.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		

Total		6	100.0		

q8i Emphasize: Geometric Dimensioning & Tolerancing (GD&T)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Emphasized	2	33.3	40.0	40.0
	Greatly Emphasized	3	50.0	60.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q8j Emphasize: CAE-Moldflow

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Emphasized	1	16.7	20.0	20.0
	Greatly Emphasized	4	66.7	80.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q8k Emphasize: CAE-Forming/Die Simulation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Emphasized	1	16.7	20.0	20.0
	Greatly Emphasized	4	66.7	80.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q8l Emphasize: CAE-Kinematics

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Emphasized	2	33.3	40.0	40.0
	Greatly Emphasized	3	50.0	60.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q8m Emphasize: Mold & Die Design software wizards

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Important	1	16.7	20.0	20.0
	Somewhat Emphasized	2	33.3	40.0	60.0
	Greatly Emphasized	2	33.3	40.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q8n Emphasize: 3-D Models, w/ surfaces

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Emphasized	3	50.0	60.0	60.0
	Greatly Emphasized	2	33.3	40.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q8o Emphasize: Solid Modeling

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Greatly Emphasized	6	100.0	100.0	100.0

q8p Emphasize: Parametric Technology

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Greatly Emphasized	6	100.0	100.0	100.0

q8q Emphasize: Rapid Prototyping

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Emphasized	3	50.0	50.0	50.0
	Greatly Emphasized	3	50.0	50.0	100.0
	Total	6	100.0	100.0	

q8r Emphasize: Rapid Tooling

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Emphasized	3	50.0	60.0	60.0
	Greatly Emphasized	2	33.3	40.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q8s Emphasize: Machine Tool

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Greatly Emphasized	5	83.3	100.0	100.0
Missing	System	1	16.7		
Total		6	100.0		

q8t Emphasize: Tool Building

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Greatly Emphasized	5	83.3	100.0	100.0
Missing	System	1	16.7		
Total		6	100.0		

q8u Emphasize: Tool Path (CAM)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Important	1	16.7	20.0	20.0
	Somewhat Emphasized	2	33.3	40.0	60.0
	Greatly Emphasized	2	33.3	40.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q8v Emphasize: CMM-Part Inspection

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Important	1	16.7	20.0	20.0
	Somewhat Emphasized	2	33.3	40.0	60.0
	Greatly Emphasized	2	33.3	40.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		

Total		6	100.0		

q8w Emphasize: Laser Measuring & Scanning

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Important	1	16.7	20.0	20.0
	Somewhat Emphasized	2	33.3	40.0	60.0
	Greatly Emphasized	2	33.3	40.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q8x Emphasize: Virtual Reality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Important	3	50.0	60.0	60.0
	Somewhat Emphasized	2	33.3	40.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q8y Emphasize: Product Development

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Emphasized	3	50.0	50.0	50.0
	Greatly Emphasized	3	50.0	50.0	100.0
	Total	6	100.0	100.0	

q8z Emphasize: Other

		Frequency	Percent
Missing	System	6	100.0

q8aa Emphasize: Other specified

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		6	100.0	100.0	100.0

q9 Elaborate on responses for Q8

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		4	66.7	66.7	66.7
	Product detailing....this is what truly drives what products cost...poor detailing in this can lead to a substandard product, or a way over budget cost...effective communication on product detailing is a must. It is a must to have related classes in tool building, even if it is on a level of assembly, tear down and maintanince. Students need to understand what they are designing more importantly than actually running the software....	1	16.7	16.7	83.3
	The only way to compete on a global scale is through technology and its implementation within our manufacturing base. Going BACKWARDS to 2d to match the rest of the world will NOT work for U.S. manufacturing, trying to implement it will further destroy our manufacturing base.	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q10a Autodesk products

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	1	16.7	20.0	20.0
	2	1	16.7	20.0	40.0
	3	2	33.3	40.0	80.0
	4	1	16.7	20.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q10b CATIA

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	1	16.7	20.0	20.0
	2	2	33.3	40.0	60.0
	3	1	16.7	20.0	80.0
	5	1	16.7	20.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q10c Pro-Engineer

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	1	16.7	20.0	20.0
	3	1	16.7	20.0	40.0
	4	1	16.7	20.0	60.0
	5	2	33.3	40.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q10d Solidworks

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	1	16.7	20.0	20.0
	2	3	50.0	60.0	80.0
	4	1	16.7	20.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q10e Unigraphics/Solid Edge

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	3	50.0	50.0	50.0
	2	1	16.7	16.7	66.7
	3	1	16.7	16.7	83.3
	4	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q11 Any other packages

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		4	66.7	66.7	66.7
	Cosmos, or any other stress / finite analisys software to understand if what you are creating will perform as you may expect.	1	16.7	16.7	83.3
	Unigraphics does not exist, should be labeled NX	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q12a Verbal communication

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Important	1	16.7	16.7	16.7
	Very Important	5	83.3	83.3	100.0
	Total	6	100.0	100.0	

q12b Written communication

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Important	1	16.7	16.7	16.7
	Very Important	5	83.3	83.3	100.0
	Total	6	100.0	100.0	

q12c Time management

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Important	6	100.0	100.0	100.0

q12d Project planning

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Important	6	100.0	100.0	100.0

q12e Presentation skills

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Unimportant	1	16.7	16.7	16.7
	Somewhat Important	1	16.7	16.7	33.3
	Very Important	4	66.7	66.7	100.0
	Total	6	100.0	100.0	

q13 Major strengths

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		2	33.3	33.3	33.3
	A wide variety of exposure is offered in the curriculum. The (2) year program gives the basics of what each perspective employer requires.	1	16.7	16.7	50.0
	Good exposure to alot of things.	1	16.7	16.7	66.7

	Great solid Modeling skills learned. Great Instructors. Good simulation of real world working conditions. Well rounded knowledge of Machining, Plastic processing, and CAE pratices.	*1*	*16.7*	*16.7*	*83.3*
	I think the program has some great instructors that work hard to create a unique learning experience for their students.	*1*	*16.7*	*16.7*	*100.0*
	Total	*6*	*100.0*	*100.0*	

q14 Weaknesses

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		*2*	*33.3*	*33.3*	*33.3*
	Difficult to have enough related courses along with the tool design to cover all needs.	*1*	*16.7*	*16.7*	*50.0*
	Due to the time frame of your 2 year course, it would be nice to see more class time dedicated to Tool & Die design. Knowing that,I feel you are doing a great job with the time you are given.	*1*	*16.7*	*16.7*	*66.7*
	I think it is the single tool design focus especially in our area. More focus on machine/product design in a production environment would be a plus.	*1*	*16.7*	*16.7*	*83.3*
	It is very hard determine what a (2) year program should offer to become not to diluted and have substance in critical areas. What will be important to each perspective employer is different in every case because of the end product and the type of industry that they are involved in. If we look at bullet or question #8, it is very evident that you have to be very careful to be strong in the basics (teaching basic mechanical design, mathematics, physics, and understinding the whys and wherefores for common practices) so that each employer can build on that with a strong candidate.	*1*	*16.7*	*16.7*	*100.0*
	Total	*6*	*100.0*	*100.0*	

q15 Changes you would make

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		*2*	*33.3*	*33.3*	*33.3*
	I feel that a 4 year degree would be great. It would give you more time to teach the students different techniques and processes involved in Tool & Die Design	*1*	*16.7*	*16.7*	*50.0*
	Please see question # 14.	*1*	*16.7*	*16.7*	*66.7*
	We need to implement a program to teach our students how to communicate and direct programs on a global scale. Proper decision making and communication on overseas tooling. What to outsource and what NOT to outsource. Outsourcing certain portions of our design and manufacturing is here to stay, let's educate ourselves how to best utilize this process as an asset.	*1*	*16.7*	*16.7*	*83.3*

	What if you had a broad first year and then the second year a student could choose to go with either mold design or die design to allow for more related course work and more focused education. If they wanted the other it would be a 3rd year...	*1*	*16.7*	*16.7*	*100.0*
	Total	*6*	*100.0*	*100.0*	

q16 How prepared grads are to enter field

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		*2*	*33.3*	*33.3*	*33.3*
	I'm not familiar with the other programs to make a good judgement, overall I think the students in the CDTD are well rounded and have a good knowledge base.	*1*	*16.7*	*16.7*	*50.0*
	I think that the program is very comparable to other programs that i am aware of. If a persective student really wants to stand out, do an internship in machining in a shop or a related area to gain the understanding of what can design and if you can make it.	*1*	*16.7*	*16.7*	*66.7*
	In my opinion you have the best well rounded program I have come across. We always look to Ferris State for potential employment opportunities with your students. Keep up the good work!!!!	*1*	*16.7*	*16.7*	*83.3*
	We have hired Ferris students and like any graduates we have hired they are not prepared for the level of intensity that is required of them in the real world.	*1*	*16.7*	*16.7*	*100.0*
	Total	*6*	*100.0*	*100.0*	

q17 Additional comments

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		*5*	*83.3*	*83.3*	*83.3*
	I truly believe that there will be a great need in the future in this arena. Keeping people interested in our industry today is your challenge. Manufacturing is sure to make a resurgance here in our country, and sadly enough we will have lost much of skilled trades that will be required keep manufacturing safe and sound. It is very difficult in a (2) year program to determine what should be empasized. Be certain to stay on course with the basics, and let each perspective employer make the investment in their areas of focus. I'm not certain any more if (2) years is enough time for this course of study, or if we should give this program a different title that embarks deeper with an engineering degree because of our changing tasks that are required. This will truly depend on how much you can teach in the period that you have, and still have substance to the important areas that need to be learned.	*1*	*16.7*	*16.7*	*100.0*
	Total	*6*	*100.0*	*100.0*	

3.E. ACCESS

3.E.1 Describe and assess the program's actions to make itself accessible to students. Use examples such as off-site courses, accelerated courses or other types of flexible learning, use of summer courses, multiple program entry points, e-learning, mixed delivery courses, scheduling.

Comment:

Delivery modes used by this program are a combination of conventional lecture lecture and laboratory courses offered Monday through Friday typically 8:00 AM until 6:00 PM. Various courses have an element of "web-based" content as created by the particular faculty teaching the course and the use of Ferris State web tools. All courses are taught on the Ferris State University Big Rapids, MI campus. Currently no off-campus or distance education opportunities are available. CDTD courses are available in Fall and Spring semester only.

3.E.2 Discuss what effects the actions described in (1) have had on the program. Use examples such as program visibility, market share, enrollment, faculty load, computer and other resources.

Comment:

No effect

3.E.3 How do the actions described in (1) advance or hinder program goals and priorities?

Comment:

No effect.

3.F. CURRICULUM

3.F.1 Program requirements. Describe and assess the program-related courses required for graduation.

a) As part of the graduation requirements of the current program, list directed electives and directed General Education courses. Provide the rationale for these selections.

b) Indicate any hidden prerequisites (instances where, in order to take a program required course, the student has to take an additional course. Do not include extra courses taken for remedial purposes).

Comment:

The educational objective of the CDTD A.A.S. degree program is to align with the developed University Mission Statement. As the world continues to move toward a "global society" it is imperative that students graduating from Ferris are well-prepared to encounter the ever changing environment of business and industry. The CDTD curriculum, in conjunction with the University General Education policy, insures graduates are ready to meet the challenges the world has to offer.

Information pertaining to the curriculum can be found in the following pages.

3.F.2 Has the program been significantly revised since the last review, and if so, how?

Comment: No

3.F.3 Are there any curricular or program changes currently in the review process? If so what are they?

Comment: No

3.F.4 Are there plans to revise the current program within the next three to five years? If so, what plans are envisioned and why?

Comment:

The program is constantly under review by the CDTD faculty in response to the needs of the program constituents.

The CDTD program is planning on working with the College of Engineering Technology to initiate the CET Laptop Program.

The CDTD program is reviewing adding a minor and/or certificate program in CAD with parametric solids as an option to other students in the College of Engineering Technology and interested students in the University at large.

CAD Drafting & Tool Design Technology

FERRIS STATE UNIVERSITY

COLLEGE OF TECHNOLOGY




Department of Mechanical Design

CAD Drafting and Tool Design Technology at Ferris State University has a focus on Product Definition and the accompanying tooling that is required to bring a product to realization. Product CAD Models are the foundation for Product Lifecycle Management (PLM). Tool Designs are the critical intelligent information that ensures cost effective creation of the tool to generate production parts. Applied hands-on technology with the ability to communicate in a paperless environment allows graduates to make an impact in their chosen career. The demand for graduates with the skills and knowledge needed to define part geometry and various tool designs using CAD continues to expand in the global marketplace. As a CAD applications technician or Tool Designer, creativity and attention to detail are essential in the development and production of diverse products such as automotive, recreational vehicles, aerospace components, heavy equipment, consumer products, furniture, medical products, electronics, food processing, and special machinery.

The CAD Drafting and Tool Design Program at Ferris State University is a two-year program that concentrates on the uses of Parametric CAD technology to produce CAD data to define a product by developing three dimensional solid models in a virtual environment. Students generate an array of part designs and develop various types of tool designs to produce parts. Specific areas of design include: Sheet Metal Stamping Dies, Plastics Injection Molds, Jig and Fixture Design & Gage Design. Part definitions include significant assemblies that utilize Surfacing, Solids Modeling, Parametric technology, and animation of the multi-part assemblies to help prove how a product is utilized in terms of motion, timing, fit and function. Students apply Rapid Prototyping and 3D Scanning technologies to support design projects. Students use related Computer-aided Engineering (CAE) software to improve tooling and product designs.

Under the guidance of industry-experienced educators students will develop skills in the following areas:

- Fabrication
- Assembly
- Specialized Tooling
- Plastics Injection Molding
- Metal Stamping Die Design
- Jig & Fixture Design
- Computer Aided Engineering (CAE)
- Product Design & Detailing
- Gage Design
- Product Development
- Material Science/Selection
- CNC Machining/Processing

PROGRAM STRENGTHS

- Proven to be a consistent, successful educational path towards a B.S. Degree (majority of students continue into a baccalaureate program at Ferris).
- 100% job placement rate upon graduation.
- Faculty with strong practical industrial experience instruct all major courses.
- Low instructor/student ratio results in personalized classroom instruction.
- Free tutoring available for all classes.
- Use of state-of-the-industry software and hardware (students enrolled in the program receive design software at no cost).
- Modern labs include computers, digitizing and prototyping technology.
- Over 50 years of graduates who lead successful careers in a variety of associated industries.

GRADUATE OPTIONS

1. **ASSOCIATE IN APPLIED SCIENCE - CAD DRAFTING & TOOL DESIGN TECHNOLOGY**

   The AAS program prepares students to enter the workforce as a CAD Technician/Operator or Tool Designer. Many graduates elect to transfer directly (with 2 additional years) into a B.S. program.

   BS transfer programs include:

   - Product Design Engineering Technology
   - Manufacturing Engineering Technology
   - Technical Education
   - Training in Business and Industry
   - Mechanical Engineering Technology
   - Plastics Engineering Technology

PROGRAM RECOGNITION

- Faculty are actively involved in educational and industrial organizations.
- Program offers a broad range of career options for graduates.
- Recognized by employers as "Best in Class" tool design program.
- Students have recently earned regional, state, and national recognition in SkillsUSA contests.
- Program encourages opportunities for involvement in student organizations such as Association of Tool Designers, SkillsUSA, Rube Goldberg team, SAE Baja and Formula racing competitions.
- Guided and endorsed by a very active industrial advisory committee.
- Educational Rapid Prototyping Center for Michigan

PROGRAM ENROLLMENT

- To apply via the internet go to: www.ferris.edu/admissions/application
- Further information can be obtained by calling the Mechanical Design Department Office at 231-591-2755
- Or email mdsn@ferris.edu

FERRIS STATE UNIVERSITY
Imagine More

Assosiate in Applied Science

CAD Drafting & Tool Design Technology

Course Sequence Guide

Student:			
Email:		ID:	
Advisor:		Ph:	

YEAR 1 - FALL SEMESTER			Crs	Gr
CDTD	111	Drafting Fundamentals (Admit to CDTD, CDTD 112 co-req)	4	
CDTD	112	Fundamentals of CAD (Admit to CDTD, CDTD 111 co-req))	4	
ENGL	150	English 1 (ENGL 074 or ACT 14)	3	
MATH	116	Intermediate Algebra/Numerical Trigonometry (19 ACT or C- in MATH 110)	4	
FSUS	100	FSU Seminar	1	
		Total	16	

YEAR 1 - SPRING SEMESTER			Crs	Gr
CDTD	121	Product Detailing w/Adv. Tolerancing (CDTD 111, 112)	3	
CDTD	122	CAD Solid Modeling w/Parametrics (CDTD 111, 112)	4	
CDTD	130	Tool Detailing (CDTD 111, 112)	2	
MFGT	150	Manufacturing Process 1	2	
ENGL	250	English 2 (ENGL 150)	3	
COMM	121	Fundamentals of Public Speaking	3	
		Total	17	

YEAR 2 - FALL SEMESTER			Crs	Gr
CDTD	211	Die Design (CDTD 121, 122; CDTD 130 recommended)	6	
CDTD	212	Computer Aided Tool Design (CDTD 121, 122; CDTD 130 recommended)	3	
MATL	240	Introduction to Material Science	4	
PHYS	211	Introductory Physics (MATH 116 or 120 or ACT 26)	4	
		Total	17	

YEAR 2 - SPRING SEMESTER			Crs	Gr
CDTD	221	Mold Design (CDTD 121, 122; CDTD 130 recommended)	6	
CDTD	222	Computer Aided Engineering (CDTD 121, 122; CDTD 130 recommended)	3	
MFGT	252	Advanced Machine Tools (MFGT 150)	2	
		Cultural Enrichment Elective	3	
		Social Awareness Elective	3	
		Total	17	

FERRIS STATE UNIVERSITY
Imagine More

Assosiate in Applied Science

CAD Drafting & Tool Design Technology

Program Academic Requirements

Student:				Code	Location	Crs
email:		ID:			Ferris	
Advisor:		Ph:		1	Transfer	

		ASSOCIATE DEGREE REQUIREMENTS MAJOR	Cr	Gr	Pts	S	Yr	Code	Notes	
CDTD	111	Drafting Fundamentals (Admit to CDTD ; CDTD 112 co-req.)	4							
CDTD	112	Fundamentals of CAD (Admit to CDTD; CDTD 111 cor-req.)	4							
CDTD	121	Product Detailing w/Adv. Tolerancing (CDTD 111, 112)	3							
CDTD	122	CAD Solid Modeling w/Parametrics (CDTD 111, 112)	4							
CDTD	130	Tool Detailing (CDTD 111, 112)	2							
CDTD	211	Die Design (CDTD 121, 122; CDTD 130 recommended)	6							
CDTD	212	Computer Aided Tool Design (CDTD 121, 122; CDTD 130 recommended)	3							
CDTD	221	Mold Design (CDTD 121, 122; CDTD 130 recommended)	6							
CDTD	222	Computer Aided Engineering (CDTD 121, 122; CDTD 130 recommended)	3							
		TECHNICAL RELATED COURSES								
MATL	240	Introduction to Material Science	4							
MFGT	150	Manufacturing Process 1	2							
MFGT	252	Advanced Machine Tools (MFGT 150)	2							
		COMMUNICATIONS COMPETENCE								
ENGL	150	English 1 (ENGL 074 or 14 ACT)	3							
ENGL	250	English 2 (ENGL 150)	3							
COMM	121	Fundamentals of Public Speaking	3							
		SCIENTIFIC UNDERSTANDING								
PHYS	211	Introductory Physics (MATH 116 or 120 or 246ACT)	4							
		QUANTITATIVE SKILLS								
MATH	116	Interm. Algebra/Numerical Trigonometry (19 ACT or C in MATH 110)	4							
		CULTURAL ENRICHMENT								
		Cultural Enrichment Elective	3							
		SOCIAL AWARENESS								
		Social Awareness Elective	3							
		FRESHMEN SEMINAR								
FSUS	100	FSU Seminar	1							

Unofficial Statistics

Major: Total Crs / Earned Crs / Honor Points	35
Degree: Total Crs / Earned Crs / Honor Points	67
GPA Major:	-
GPA Degree:	-

AAS Minimum General Education Requirements:

Cultural Enrichment (CE) – 3 credits; Social Awareness (SA) - 3 credits; Communications - 6 credits; Scientific Understanding - 3/4 credits;

Reference: http://www.ferris.edu/htmls/academics/gened/gen_edspecific.htm

CAD Drafting & Tool Design Technology CDTD

Program home page
Download PDF

Degree Type: Associate in Applied Science

College: Technology

Career Path: Engineering/Manufacturing and Industrial Technology

Locate a Course
Find a Degree
Learn about a Program
Follow a Career Path

Why Choose CAD Drafting and Tool Design Technology?

The CAD Drafting and Tool Design program concentrates on the use of CAD in product drawing, dies (metal stamping), molds (plastic processes) and jig, fixture and gauge design. Students are involved with computers throughout the program to familiarize them with CAD software and applications such as detailing, GD & T, general tolerancing, wire frame, surfacing, solid modeling with parametric technology and Rapid Prototyping. Computer-aided engineering software for mold design and mechanical applications are also used. Student solid models are processed and created on our Rapid Prototyping equipment.

Tool design is critical to the manufacturing industry. Tooling is the foundation for product design and the manufacturing industry. Students learn to design and detail basic tooling requirements for the manufacture of products. Consideration for safety of the design and manufacturing processes are also emphasized. Students also gain an understanding of the related areas of mathematics, materials and machining.

Prepare for a Great Career

Converting an abstract idea into a working design is the job of the drafter and tool designer. The drafter/designer may be involved in drawing one of many parts of a complete assembly, then designing the tooling-jigs, fixtures, gauges, dies, injection molds and special machines-to produce one or all of those parts.

For the drafter/tool designer, creativity and attention to detail are essential in production of such diverse products as automotive and aircraft components, consumer products, medical products, electronics, food processing and special machinery.

Graduates of the program find immediate employment as computer-aided tool detailers, product drafters, entry-level tool designers, CAD operators and other technical-related positions. Many students choose to continue into B.S. programs such as Product Design Engineering Technology, Manufacturing Engineering Technology, Plastics Engineering Technology, Business Management or Occupational (Teacher) Education.

Admission Requirements

Admission to the College of Technology is open to high school graduates who demonstrate academic preparedness, maturity and seriousness of purpose with backgrounds appropriate to their chosen program of studies. Among first-time students in our technical programs, the average high school GPA is 2.8, and the average ACT composite score is 20.

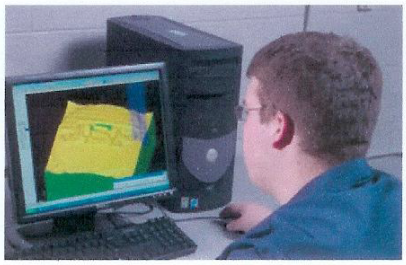
Students entering the CAD Drafting and Tool Design Technology program should have a background in CAD and a desire to develop tool design skills. Admission is open to high school graduates with a minimum 2.0 GPA and a minimum ACT math subscore of 15 (19 recommended).

Required Courses		Credit Hours
General Education		
COMM 121	Fundamentals-Public Speaking	3
ENGL 150	English 1	3
ENGL 250	English 2	3
MATH 116	Intermediate Algebra-Num Trig	4
PHYS 211	Introductory Physics 1	4
*Electives:	Cultural Enrichment	3
*	Social Awareness	3
Major		
CDTD 111	Drafting Fundamentals	6
CDTD 112	CAD Fundamentals	3
CDTD 121	Product Detailing	3
CDTD 122	Solid Modeling	4
CDTD 130	CAD Tool Detailing	2
CDTD 211	Die Design	6
CDTD 212	Tool Design	3
CDTD 221	Mold Design	6
CDTD 222	Computer Aided Engineering	3
Related Courses		
MATL 240	Intro to Material Science	4
MFGT 150	Manufacturing Processes	2
MFGT 252	Advanced Machine Tools	2
Minimum credit hours required for A.A.S. degree:		67

Mechanical Design Department

» Programs » Faculty and Staff

CAD Drafting & Tool Design Technology Associate in Applied Science



This program educates future injection mold designers, metal stamping die designers and machine designers who, at times, work closely with product designers, mechanical engineers and manufacturing engineers. Tool designers are an important member of the design engineering team.

You will learn to use software that is current in the industry including 3-D CAD. You will apply CAD and design concepts in all the required CDTD courses. Solid modeling of parts and tools and animation of their assemblies are program requirements.

You will create rapid prototyped models for fit and functional analysis. Also, you will learn inspection and reverse engineering techniques through the use of a Faro Arm 3D digitizer. Emphasis on geometric dimensioning and tolerancing applications exist throughout the curriculum.

Upon graduation, you can directly transfer into other programs offered at Ferris including Product Design Engineering Technology, Manufacturing Engineering Technology, Plastics Engineering Technology and Career and Technical Education.

Mechanical Engineering Technology Associate in Applied Science

Upon choosing this associate degree program, you will begin with foundation courses in math, applied science, CAD, manufacturing processes and communication before moving on to applied engineering courses for a sound background for further study or entering the workforce.

Your preparation for this program should include high school math through Algebra II and trigonometry. Additional math is encouraged. High school courses in chemistry and physics are highly recommended. Technical coursework, such as CAD/drafting, shop, electronics and automotive is also encouraged. Applied engineering with hands-on labs play an important role in the learning experience.

Most graduates of the A.A.S. in MET continue their education, since the credits earned will transfer directly into many bachelor's programs. Most choose to pursue a bachelor s degree in Mechanical Engineering Technology, Product Design Engineering Technology or Manufacturing Engineering Technology. Still others choose business, technical education, or other technical discipline.

Product Design Engineering Technology Bachelor of Science

The Product Design Engineering Technology program prepares you to effectively participate as a design team member, create complex design layouts, analyze and optimize the economics of design, create and define complex surfaces or shapes using 3-D modeling techniques utilizing ProEngineer software, perform static and dynamic analyses on a design and much more.

If you like to invent or create, this program that bridges the gap between art and science is for you. ***Only one other program of this kind exists in the nation!***

The program encompasses the third and fourth years of college study and culminates in a baccalaureate degree. You must complete an approved two-year associate degree within the College of Engineering Technology or an equivalent two-year Associate in Applied Science degree from another institution.

Employment opportunities exist across the spectrum of the product design field. Specific job

titles might include product designer, layout drafter, project manager, product developer, computer-aided designer, mechanical designer or design engineering technologist.

Mechanical Engineering Technology Bachelor of Science

The Mechanical Engineering Technology program prepares you for a broad range of occupations and challenges. Beginning with foundation courses in math, applied science, CAD, manufacturing processes and communication, you then move on to the applied engineering courses that give you a solid technical background for your career. Strong analytic and problem-solving skills will be developed. Your understanding of the principles taught in the classroom is enhanced with many hands-on labs and real-world applications provided by faculty with extensive industrial experience.

As a graduate of the program, you will find a great variety of jobs open to you. Opportunities are available in the design and development of products, machines and processes. Other opportunities will be in manufacturing, operations and technical sales. Areas of employment will include automotive and transportation, power generation, climate control, machine design, manufacturing, materials and automation.

For more information:

Thomas Hollen, Department Chair

Sandra Kerridge, Department Secretary
Mechanical Design Department
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Fax:231.591.2271
Email: hollent@ferris.edu

Curriculum Sheets

- Mechanical Engineering Technology (Associate)
- CAD Drafting & Tool Design Technology (Associate)
- Product Design Engineering Technology (Bachelor)
- Mechanical Engineering Technology (Bachelor)

G. QUALITY OF INSTRUCTION

3.G.1 Discuss student and alumni perceptions of the quality of instruction.

Comment:

Surveys contained in Section 2A and Section 2C indicate that the quality perception of faculty and students as to the quality of instruction is very good. Various questions on the surveys cover this related topic.

3.G.2 Discuss advisory committee and employer perceptions of the quality of instruction.

Comment:

Surveys contained in Section 2B and Section 2F indicate that the quality perception of faculty and students as to the quality of instruction is very good. Various questions on the surveys cover this related topic.

3.G.3 What departmental and individual efforts have been made to improve the learning environment, add and use appropriate technology, train and increase the number of undergraduate and graduate assistants, etc.?

Comment:

The faculty are constantly striving to improve the quality of instruction. As technology has been implemented into the available instructional spaces on campus, the faculty has adapted their teaching styles and methods.

Thanks to the efforts of faculty member Mark Hill, he was able to obtain a $21.8 million in-kind grant NX and Solid Edge software in enhance our programs software needs. (see attached press release)

The department does not utilize undergraduate or graduate assistants. All courses are taught by tenure-track faculty.

Student lab tutors are used regularly throughout the curriculum and are funded by the Academic Support Center.

About Us: Media and Analysts: Press Coverage: Press Release

Ferris State University to Receive Product Lifecycle Management (PLM) Software from UGS

FOR RELEASE Tuesday, March 28, 2006

PLANO, Texas and BIG RAPIDS, Mich. – UGS Corp., a leading global provider of product lifecycle management (PLM) software and services, today announced it is providing an in-kind grant of its NX™ and Solid Edge® software that has a commercial value of $21.8 million.

The grant is being made through UGS' Global Opportunities in Product Lifecycle Management (GO PLM) initiative, which leads the PLM industry in the commercial value of in-kind grants it provides and brings together five complementary community involvement programs focused on academic partnership, regional productivity, youth and displaced worker development and the Partners for the Advancement of Collaborative Engineering Education program. The GO PLM™ program provides PLM technology to more than 860,000 students annually at nearly 8,400 global institutions, where it is used at every academic level – from middle schools to graduate engineering research programs.

"The College of Technology at Ferris is a nationally-recognized leader in manufacturing and its CAD Drafting and Tool Design program graduates are known for their superior design abilities and immediate contributions to industry upon graduation," said Mark Hill, professor, CAD Drafting and Tool Design at FSU. "FSU has been educating students in Plastics Injection Mold Design, Sheet Metal Die Stamping Design and Jig and Fixture Design for more than 50 years and the addition of the NX and Solid Edge suites of software will enable our graduates to enter the industry with a greater working knowledge of current industrial software recognized throughout the world." "Innovation and the ability to bring the right products to market quickly are key business drivers for today's most competitive companies," said David Shirk, executive vice president of Global Marketing, UGS. "Providing software to leading universities like FSU empowers knowledge for 21st Century engineers to tie into global innovation networks that the world's leading manufacturers are leveraging to build the most innovative products. UGS is committed to FSU's outstanding students and dedicated faculty. UGS is proud to build on its relationship with FSU and manufacturers in Michigan and beyond."

FerrisState University is a career-oriented public university located in Big Rapids, Mich. More than 170 degrees are offered through the colleges of Allied Health Sciences, Arts and Sciences, Business, Education and Human Services, Optometry, Pharmacy, and Technology. Ferris State University is in its second century as a top technical and professional university, providing the education to make its graduates immediately employable in their chosen fields. For more information on Ferris State University please visit http://www.ferris.edu/.

About UGS

UGS is a leading global provider of product lifecycle management (PLM) software and services with nearly 4 million licensed seats and 46,000 customers worldwide. Headquartered in Plano, Texas, UGS' vision is to enable a world where organizations and their partners collaborate through global innovation networks to deliver world-class products and services while leveraging UGS' open enterprise solutions, fulfilling the mission of enabling them to transform their process of innovation.

Primary Contact	**Additional Contact(s)**
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+1 972 987 3210	+1 231 591 2514
paschal@ugs.com	hillm@ferris.edu

3.G.4 Describe the types of professional development that faculty participated in, in efforts to enhance the learning environment (e.g. Writing Across the Curriculum Center for Teaching and Learning, etc.) .

Comment:

The faculty is very diligent in professional development activities. Please reference faculty resumes in Appendix B for a list of activities.

3.G.5 What efforts have been made to increase the interaction of students with faculty and peers? Include such items as developmental activities, seminars, workshops, guest lectures, special events, and student participation in the Honors Program Symposium.

Comment:

The students participate in the University recognized Association of Tool Designers with faculty. Activities include social events, skiing, golf, softball, community activities, tours and field trips.

Faculty member Todd Rose takes his Die Design class on an annual tour of local manufacturing companies that run die tooling.

3.G.6 Discuss the extent to which current research and practice regarding inclusive pedagogy and curriculum infuse teaching and learning in this program.

Comment:

The current group of department faculty has a combined 83+ years of teaching and industrial experience. Each faculty member has their own unique teaching styles and strategies. A students perception of learning depends directly on their interest, pedagogical affect, and their learning performance and indirectly on the student-instructor interaction, the instructor's responsiveness, course organization, the instructor's likeability/concern, and the student's learning performance. Likeability / concern indirectly affects student interest by influencing learning performance. The results yield recommendations for schools, department heads, and university administrators.

3.G.7 What effects have actions described in (5) and (6) had on the quality of teaching and learning in the program?

Comment:

Students receive a diverse educational experience by being exposed to all the members of the program faculty at one point or another throughout their time at Ferris State. This diversity in teaching styles requires students to adapt to the particular course, much like they must adapt to a particular leadership style they encounter in business & industry.

3.H COMPOSITION AND QUALITY OF FACULTY

3.H.1 List the names of all tenured and tenure-track faculty by rank.

a) Identify their rank and qualifications.
Comment: (See attached web page)

Professor - Mark Hill

Associate Professor - Todd Rose

Associate Professor - Dan Wanink

b) Indicate the number of promotions or merit awards received by program faculty since the last program review.
Comment: 2

c)Summarize the professional activities of program faculty since inception or the last program review (attendance at professional meetings, poster or platform presentations, responsibilities in professional organizations, etc.).
Comment:
Please reference faculty resumes in Appendix B for complete list of faculty professional activities.

Todd Rose
Associate Professor
Office : JOH-217
Phone: (231) 591-2958
E-mail Address: roset@ferris.edu
Office Hours:

Profile:

EDUCATION:

- MS Industrial Management, Western Michigan University
- BS Trade Technical Teacher Education, Ferris State University
- AAS Technical Drafting/Tool Design, Ferris State University

AFFILIATIONS:

- Member of Society of Manufacturing Engineers

AREAS OF EXPERTISE:

Technical drafting, descriptive geometry, CAD, tool design, GD&T, manufacturing engineering, product design, metal stamping design

Mechanical Design

Mark Hill
Professor
Office : SWN 405
Phone: (231) 591-2514
E-mail Address: markhill@ferris.edu
Office Hours:

Profile:

EDUCATION:

- MS Occupational Education, Ferris State University
- BS Trade Technical Teacher Education, Ferris State University
- AAS Technical Drafting and Tool Design, Ferris State University

AFFILIATIONS:
Independent Consultant
Society of Manufacturing Engineers service provider

AREAS OF EXPERTISE:
Injection Mold Design, Sheet Metal Die Stamping Design, CAD Software Selection Implementation, Blueprint Reading

Dan Wanink
Associate Professor
Office : JOH-218
Phone: (231) 591-5021
E-mail Address: danielwanink@ferris.edu
Office Hours:

Profile:

3.H.2 Workload

a) What is the normal, annualized teaching load in the program or department? Indicate the basis of what determines a "normal" load. On a semester-by-semester basis, how many faculty have accepted an overload assignment?
Comment:
See attached load for CDTD.
Also see attached work schedules Appendix B.

b) List the activities for which faculty receive release time.
Comment:
None of the faculty receive release time.

09/01/08 rfg

Note: Loads are expressed as credit hours/contact hours, i.e. 12/18

PROGRAM: ***CAD DRAFTING & TOOL DESIGN***

Name	FALL Credits	FALL Contacts	SPRING Credits	SPRING Contacts	TOTALS FOR FALL-SPRING Credits	TOTALS FOR FALL-SPRING Contacts	Overload Semester	Overload Location	Overload Course and Credits	Overload Configuration Lec	Overload Configuration Lab	Overload Cost $70.00 $35.00	Adjunct or Temporary Cost
Mark Hill	8	16	14	28	22	44				0	0	$0	
										0	0	$0	
											0	$0	
Todd Rose	7	21	9	15	16	36				0	0	$0	
Dan Wanink	15	27	7	13	22	40	Fall	FSU	FSUS 100	1	0	$1,050	
							Fall	FSU	CDTD 112	1	0	$1,050	
							Fall	FSU	CDTD 112	2	0	$2,100	
												$0	
TOTAL					60	120						$4,200	$0

3.H.3 Recruitment

a) What is the normal recruiting process for new faculty?
Comment:
A new faculty member has not been added in ten years. Advertisement in professional and local publications. The most valuable recruiting tools would be "word-or-month" and alumni.

b) What qualifications (academic and experience) are typically required for new faculty?
Comment:
The successful candidate will have 5-10 years industrial experience in tool and/or product design. In addition, the candidate will possess Master's degree upon hiring or will be required to obtain such a degree within four years of hiring.

c) What are the program's diversity goals for both gender and race/ethnicity in the faculty?
Comment:
Based on University standards.

d) Describe and assess the efforts being made to attain goals in (c).
Comment:
The hiring process of a new faculty is designed to provide the program with the most qualified candidate regardless of gender, race and ethnicity.

3.H.4 Orientation. Describe and assess the orientation process for new faculty.

Comment:

A new faculty member in the department has constant guidance from the department tenure-track faculty. A department faculty is assigned as a mentor for the new hire to consult with on a regular basis. The department has established a list of academic topics that are discussed with the new hire during their first year. No student advisees are assigned to the new hire during the first academic year. The new hire is also expected to participate in University sponsored events for new faculty.

3.H.5 Reward Structure: e.g., salary, professional development funds, travel funds, UCEL and FSUGR incentive money.

a) Describe the reward structure in the program/department /college as it relates to program faculty. Indicate the type of reward and eligibility criteria.
Comment:
Financial compensation to the faculty abides by the College of Engineering Technology, University and/or Ferris Faculty Association guidelines.

b) Does the existing salary structure have an impact on the program's ability to recruit and retain quality faculty?
Comment:
The existing salary structure certainly plays a significant role in the hiring process. Many applicants are interested in a faculty position until they become aware of the compensation package. With that being considered, the department has been successful in hiring quality faculty members.

c) Is the reward structure currently in place adequate to support faculty productivity in teaching, research, and service? If not, what recommendations would you make to correct the situation.
Comment: Yes.

d) Is enhancing diversity and inclusion a component of the reward structure? Please explain.
Comment: No.

3.H.6 Graduate Instruction (if applicable)

Comment:
The CDTD program does not offer, nor teach any graduate level academic courses. This section does not apply.

a) List all faculty teaching graduate courses.
b) What percentage of graduate courses is taught by non-tenure-track faculty? Please comment.
c) What are the program's (or department's) criteria for graduate faculty?
d) Have all graduate faculty (including non-tenure-track faculty) met the criteria? Please comment.

3.H.7 Non-Tenure-Track and Adjunct Faculty.

a) Please provide a list for the last academic year of full-time non-tenure-track and adjunct faculty who taught courses in the program. For full-time non-tenure track faculty, indicate the length of their appointments and the number of years of service at the University. Comment on the program's ability to retain non-tenure-track faculty.

Comment:
All faculty are tenure-track.

b) What percentage of program courses is taught by the faculty in (a)? What courses are they teaching? Please comment.
Comment: 0

c)Describe the required qualifications (academic and experiential) for faculty listed in (a). Indicate if all faculty have met the criteria, and if not, what is being done to resolve the situation?
Comment:
All faculty meet required qualifications.

d) Does the program consider the current use of non-tenure-track faculty to be appropriate? Why or why not?
Comment:
Does not apply.

e)If the program is accredited, what position if any does the accrediting body have regarding the use of non-tenured and adjunct faculty?
Comment:
At this time the program does not have external accreditation.

3.I SERVICE TO NON-MAJORS

3.I.1 Identify and describe the General Education service courses provided by the program faculty for other departments at FSU

Comment:

FSUS 100 is the only General Education course taught by department faculty. In addition, the CDTD faculty have taught ETEC 140 for the College of Engineering Technology as a general class for College students.

3.I.2 Identify and describe any non-General Education service courses or courses required for other programs. Comment on your interaction with the departments or programs for which the courses are provided.

Comment:

3.I.3 Discuss the impact of the provision of General Education and non-General courses has on the program.

Comment:

The impact of department faculty providing General Education and non-General courses is minimal. The only General Education course taught is two (2) sections of FSUS 100 in the fall semester.

3.I.4 Does the program plan to increase, decrease, or keep constant its level of service courses? Explain.

Comment:

The program will continue to meet the needs of the campus community as needed.

3.J DEGREE PROGRAM COST AND PRODUCTIVITY DATA. *Submit Institutional Research and Testing data. Comment on the data.*

Comment: See enclosed University data.

Ferris State University
Degree Program Costing 2002- 2003 (Summer, Fall, and Winter)

College : Technology
Department : Mechanical Design

Program Name: CAD Drafting and Tool Design AAS

Program Credits Required (Total credits to graduate) 66

*Instructor Cost per Student Credit Hour(SCH) (Average for program)	$190.50
**Department Cost per Student Credit Hour	$27.39
***Dean's Cost per Student Credit Hour	$16.66
Total Cost per Student Credit Hour (Average for program)	**$234.55**
Total Program Instructor Cost (Assumes a student will complete program in one year)	$12,573.14
Total Program Department Cost	$1,807.62
Total Program Dean's Cost	$1,099.80
Total Program Cost (Assumes a student will complete program in one year)	**$15,480.56**

Course ID	Level	Instructor Cost	Dept Cost	Dean's Cost	SCH's Produced	Instructor Cost/SCH	Dept Cost/SCH	Dean's Cost/SCH	Credits Required	Program Instructor Cost	Program Dept Cost	Program Dean's Cost
CDTD111	L	$30,670	$5,489	$4,183	188	$163	$29	$22	4	$653	$117	$89
CDTD112	L	$22,572	$5,606	$4,272	192	$118	$29	$22	4	$470	$117	$89
CDTD121	L	$28,114	$3,241	$2,470	111	$253	$29	$22	3	$760	$86	$67
CDTD122	L	$27,753	$4,438	$3,382	152	$183	$29	$22	4	$730	$117	$89
CDTD130	L	$30,334	$2,219	$1,691	76	$399	$29	$22	2	$798	$58	$44
CDTD211	L	$59,819	$6,080	$3,871	174	$344	$29	$22	6	$2,063	$175	$133
CDTD212	L	$22,048	$2,628	$2,002	90	$245	$29	$22	3	$735	$88	$67
CDTD221	L	$59,429	$6,080	$3,871	174	$342	$29	$22	6	$2,049	$175	$133
CDTD222	L	$20,567	$2,453	$1,869	84	$245	$29	$22	3	$734	$88	$67
COMM121	L	$289,866	$55,998	$21,422	3600	$81	$16	$6	3	$242	$47	$18
CULTELE	E	$2,095,711	$340,667	$192,576	21081	$97	$16	$6	3	$291	$47	$18
ENGL150	L	$668,824	$93,433	$40,416	6790	$98	$14	$6	3	$295	$41	$18
ENGL250	L	$499,521	$71,315	$30,848	5184	$96	$14	$6	3	$289	$41	$18
MATH116	L	$163,415	$10,589	$11,449	1923	$85	$6	$6	4	$340	$22	$24
MATL240	L	$78,006	$36,722	$14,685	660	$118	$56	$22	4	$473	$223	$89
MFGT150	L	$59,317	$14,577	$5,829	262	$226	$56	$22	2	$453	$111	$44
MFGT252	L	$15,652	$3,116	$1,246	56	$279	$56	$22	2	$559	$111	$44
PHYS211	L	$176,319	$36,391	$10,045	1695	$104	$22	$6	4	$418	$86	$24
SOCAELE	E	$1,789,828	$451,271	$190,094	24281	$74	$19	$8	3	$221	$56	$23

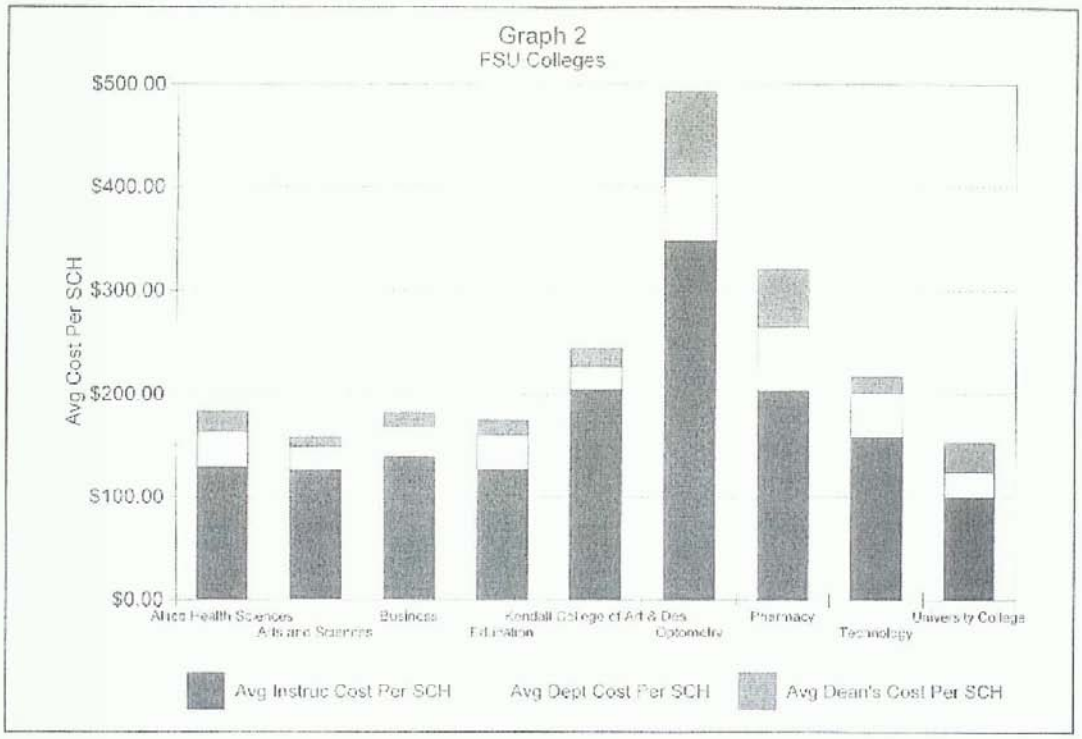
* Instructor Cost - ***Salary & Fringe*** - the actual cost to teach a course
** Department Cost - ***Departmental Level Non Instructor Compensation, Supplies and Equipment*** - departmental average applied to all course prefixes within a department
*** Dean's Cost - ***Dean's Level Non Instructor Compensation, Supplies and Equipment*** - college average applied to all course prefixes within a college

Ferris State University

Average Instructor, Department and Dean's Cost Per SCH for Degree Programs

FSU Colleges

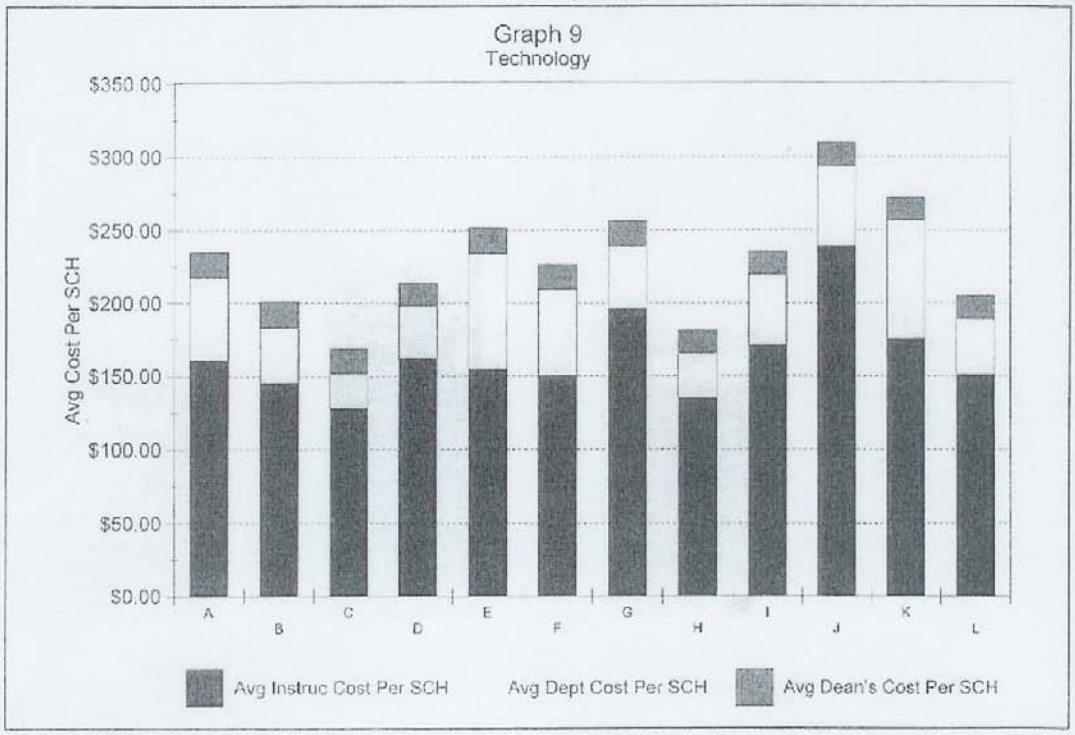
2003 - 2004 Data



Colleges	Avg Instructor Cost/SCH	Avg Dept Cost/SCH	Avg Dean's Cost/SCH	Total Avg Cost/SCH
Allied Health Sciences	$129.05	$33.60	$20.56	$183.21
Arts and Sciences	$126.58	$21.93	$9.52	$158.04
Business	$138.66	$28.78	$14.50	$181.95
Education	$127.05	$32.14	$15.49	$174.67
Kendall College of Art & Design	$204.55	$21.75	$18.11	$244.41
Optometry	$347.89	$61.93	$83.22	$493.04
Pharmacy	$202.84	$61.36	$56.26	$320.47
Technology	$158.57	$42.03	$16.47	$217.06
University College	$100.05	$24.14	$28.61	$152.83

Ferris State University

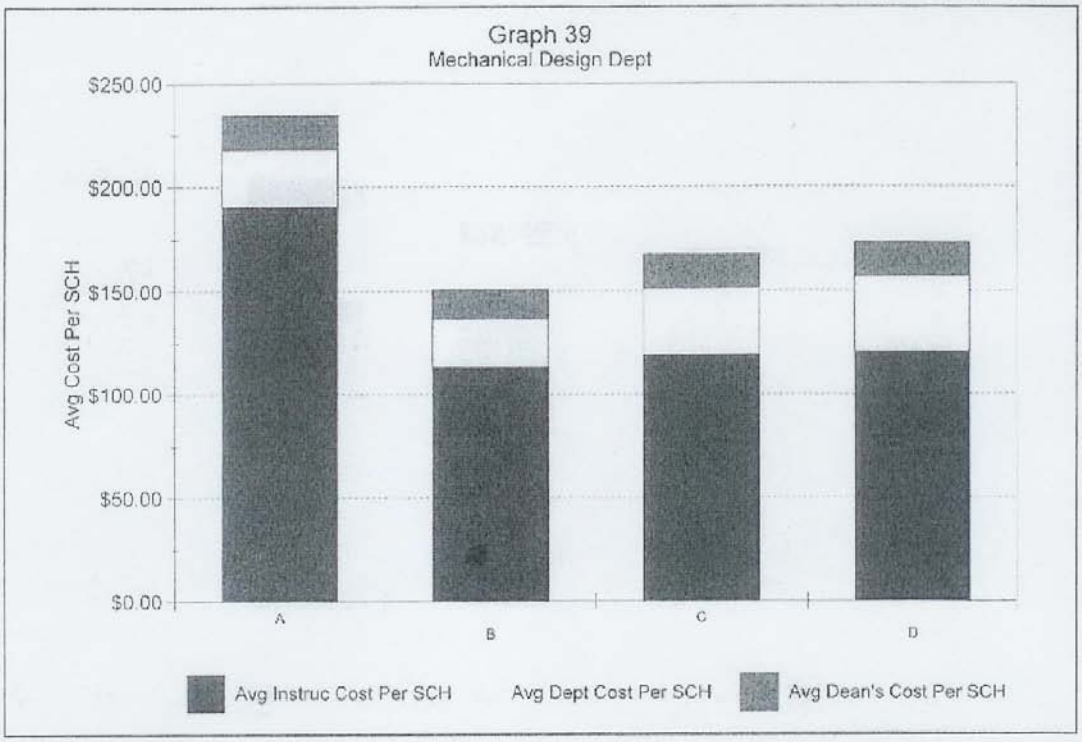
Average Instructor, Department and Dean's Cost Per SCH for Degree Programs
Departments in the College of Technology
2003 - 2004 Data



	Departments	Avg Instructor Cost/SCH	Avg Dept Cost/SCH	Avg Dean's Cost/SCH	Total Avg Cost/SCH
A	Architectural Tech & Facilities Mgmt	$160.66	$56.42	$17.50	$234.58
B	Automotive	$145.58	$37.52	$18.09	$201.19
C	Construction Technology & Management	$128.39	$23.48	$16.55	$168.42
D	Electronics/CNS	$162.30	$35.64	$15.48	$213.41
E	Heavy Equipment	$154.87	$78.46	$17.87	$251.20
F	HVACR	$150.58	$58.71	$16.80	$226.09
G	Manufacturing Engineering Technology	$196.45	$42.16	$17.38	$256.00
H	Mechanical Design	$135.49	$29.96	$15.83	$181.28
I	Plastics and Rubber	$171.01	$47.96	$15.97	$234.94
J	Printing & Imaging Technology Mgmt	$238.44	$54.78	$16.33	$309.54
K	Surveying	$175.26	$80.96	$15.84	$272.07
L	Welding	$151.00	$37.80	$16.28	$205.08

Ferris State University

Average Instructor, Department and Dean's Cost Per SCH for Degree Programs
Mechanical Design Department
2003 - 2004 Data



	Programs	Avg Instructor Cost/SCH	Avg Dept Cost/SCH	Avg Dean's Cost/SCH	Total Avg Cost/SCH
A	CAD Drafting and Tool Design AAS	$190.50	$27.39	$16.66	$234.55
B	Mechanical Engineering Technology AAS	$113.21	$23.39	$14.32	$150.91
C	Mechanical Engineering Technology BS (Yrs 3 & 4)	$119.04	$32.27	$16.11	$167.42
D	Product Design Engineering Technology BS (Yrs 3 & 4)	$120.59	$36.38	$16.18	$173.14

3.K ASSESSMENT AND EVALUATION Describe and evaluate the program's assess mechanisms.

3.K.1 List and describe what variables are tracked and why when assessing the effectiveness of the program (e.g. mastery of essentials of subject area, graduation rates, employment rates, pass rates on professional exams).

3.K.2 Provide trend data for the variables listed in (1). Compare the data to accreditation benchmark standards if applicable, or provide some other type of assessment of the data.

3.K.3 Describe how the trend data in (2) is used to assess the rigor, breadth, and currency the degree requirements and curriculum.

3.K.4 Describe how the trend data in (2) is used to assess the extent to which program goals are being met.

Comment:

Assessment and evaluation is conducted through:

- Group and individual presentations.
- Portfolios with drawings and designs presented in a professional manner.
- Resume
- Design projects
- Quizzes and worksheets
- Examinations and tests
- Continued faculty evaluation

Faculty compare student work with what would be expected in industry – based on their experience.

The results (Section 1) show satisfactory overall understanding of expectations Faculty use feedback to use for subsequent classes.

Faculty re-evaluate outcomes for each course at the end of each semester (ie SAI). Information is used to continually improve courses taught.

Assessment Impact by Unit Objectives

Ferris State University

Program - CAD Drafting/Tool Design Technology (A.A.S.)

Program - CAD Drafting/Tool Design Technology (A.A.S.)

Outcome: Range of Assignments and critical thinking

Student will develop a portfolio with drawings and designs presented in a professional manner for the faculty to review.

Outcome Type: Learning
End Date: 05/08/2009
Outcome Status: Active

Means of Assessment

Assessment Method	Criterion for Success	Assessment Schedule	Active
Grading of project assignments. **Assessment Method Category:** Portfolio/E-Portfolio	Grade obtained in class and students understanding of work required.	Continuous during semester	Yes

Results

Result	Action	Follow-Up	Action
Portfolio/E-Portfolio - 02/09/2009 - Faculty compare student work with what would be S09 expected in industry ? based on their experiences S10 S11 **Classification:** Inconclusive	02/09/2009 - Collect data from faculty on average grade		2 - Pending Action

Outcome: understanding of program materials

Student must successfully complete course exams

Outcome Type: Learning
End Date: 05/08/2009
Outcome Status: Active

Means of Assessment

Assessment Method	Criterion for Success	Assessment Schedule	Active
Course Final exam **Assessment Method Category:** Test - Internally Developed - Pre/Post or Post **Related Documents:** CDTD 111 CDTD 112 CDTD 121 CDTD 122 CDTD 130 CDTD 211 CDTD 212 CDTD 221 CDTD 222	Successfully obtain a passing grade	Each semester	Yes

Results

Results			
Result	**Action**	**Follow-Up**	**Action**
No Results reported.			

Outcome: Communication

Student will have an exit interview with a faculty member, at which they explain the project and discuss the value of courses to their overall development.

Outcome Type: Learning
End Date: 05/08/2009
Outcome Status: Active

Means of Assessment			
Assessment Method	**Criterion for Success**	**Assessment Schedule**	**Active**
Inter view with faculty member at end of semester **Assessment Method Category:** Interview **Related Documents:** CDTD 221	Student must show understanding of course material and how it relates to work with what would be expected in industry	Each semester	Yes

Results			
Result	**Action**	**Follow-Up**	**Action**
No Results reported.			

Outcome: Resume

Student will develop a resume of their work and educational experiences.

Outcome Type: Other
End Date: 05/08/2009
Outcome Status: Active

Means of Assessment			
Assessment Method	**Criterion for Success**	**Assessment Schedule**	**Active**
By faculty at the end of Sophomore year. **Assessment Method Category:** Written Product (essay, research paper, journal, newsletter, etc.)	A document which meets faculty criteria for a successful resume.	Annually	Yes

Results			
Result	**Action**	**Follow-Up**	**Action**
No Results reported.			

3.L ADMINISTRATION EFFECTIVENESS

3.L.1 Discuss the adequacy of administrative and clerical support for the program.
Comment:
The support of the department programs by the university community is acceptable to achieve the program educational objectives and outcomes.
At present, we have one clerical staff to be shared by six other programs.

3.L.2 Are the program and/or department run in an efficient manner? Please explain.
Comment:
Yes. The department makes every effort to be responsible stewards of the University funds provided. The CDTD program is operated to the highest standards within the scope of the limited available financial resources.

3.L.3 Are class and teaching schedules effectively and efficiently prepared? Please comment.
Comment:
The department course schedules are created and modified by the faculty in conjunction with University policy. Course scheduling decisions take in to consideration the needs for student and faculty to operate efficiently.

3.L.4 Are students able to take the courses they need in a timely manner? Please comment.
Comment:
However, we have had some issues with Physics.

PROGRAM PROFILE

Section 3 : Program Profile: *Include Administrative Program Review document in this section. Provide the number and percentage for variable addressed for each of the years since last program review.*

3.A. PROFILE OF STUDENTS

3.A.1 Student Demographic Profile

3.A.1.a Gender, race/ethnicity, age
Comment: See chart (University data)

3.A.1.b In-state and Out-of-state
Comment: See chart (University data)

3.A.1.c. Full-time and part-time.
Comment: See chart (University data)

3.A.1.d Attended classes during the day, in evenings, and weekends.
Comment: Courses are offered during day and evening only.

3.A.1.e Enrolled in classes on and off campus.
Comment:
All courses for CDTD A.A.S. degree program are offered only at the Ferris State Big Rapids campus.

3.A.1.f Enrolled in 100% on-line and /or mixed delivery courses.
Comment:
All courses for CDTD A.A.S. degree program are offered only at the Ferris State Big Rapids campus in a conventional "lecture-laboratory" format. No courses are offered on-line and/or mixed delivery.

3.A.1.g Discuss how the information presented in (a) through (f) impacts the curriculum, scheduling, and /or delivery methods in the program.
Comments:
Courses in the CDTD program are typically held Monday through Friday, 8:00 AM to 6:00. The combination of this time schedule and the fact all CDTD students are full-time, the curriculum, course scheduling, and course information delivery methods work very well.

Enrollment (Headcounts) - On, Off, and Total

Term	Fresh On	Fresh Off	Fresh Tot	Soph On	Soph Off	Soph Tot	Junior On	Junior Off	Junior Tot	Senior On	Senior Off	Senior Tot	1st Prof On	1st Prof Off	1st Prof Tot	Mast On	Mast Off	Mast Tot
200408	25	0	25	34	0	34	9	0	9	2	0	2	0	0	0	0	0	0
200508	38	0	38	17	0	17	15	0	15	2	0	2	0	0	0	0	0	0
200608	30	0	30	24	0	24	5	0	5	1	0	1	0	0	0	0	0	0
200708	22	0	22	27	0	27	2	0	2	0	0	0	0	0	0	0	0	0
200808	22	0	22	23	0	23	3	0	3	0	0	0	0	0	0	0	0	0

		Gender			Ethnicity						Full/Part Time	
Term	Enrolled	Male	Female	Unknown	Black	Hispanic	Indian/Alaskan	Asian/Pac Islander	White	Foreign	Full Time	Part Time
200408	70	69	1	6	1	0	0	0	63	0	67	3
200508	72	68	4	5	1	1	0	0	65	0	67	5
200608	60	53	7	1	0	0	1	0	58	0	59	1
200708	51	43	8	0	1	1	0	0	49	0	48	3
200808	48	43	5	0	1	1	1	0	45	0	46	2

		Residency			Age	FSU GPA			ACT		
Term	Blank	Resident	Midwest Compact	Non-Resident	Avg. Age	Avg. GPA	Min. GPA	Max. GPA	Avg. ACT	Min. ACT	Max. ACT
200408	0	69	0	0	24	2.78	1.864	3.866	19.97	14	27
200508	0	70	2	0	22	2.63	1.413	3.635	19.89	15	27
200608	0	59	1	0	21	2.87	1	3.95	20.53	12	34
200708	0	51	0	0	20	2.76	1.61	3.88	20.75	13	34
200808	0	48	0	0	19	2.55	1.11	3.72	20.57	13	27

3.A.2 QUALITY OF STUDENTS

3.A.2.a What is the range and average GPA of all students currently enrolled in the program? ACT? Comment on this data.

Comment:

Please see University data supporting information. The data reflects the ability of the Ferris CDTD program to attract a diverse student with a wide range of academics.

Ferris State University
APR Graduated 2003-04 Through 2007-08
Average ACT

TE
CAD Drafting/Tool Design Tech
AAS

ACT

Year	Average ACT	Min. ACT	Max. ACT
2003-2004	21.69	14	28
2004-2005	20.83	14	25
2005-2006	19.94	16	24
2006-2007	19.25	15	23
2007-2008	20.10	17	28

MECHANICAL DESIGN 2008 FA STUDENTS
ACT COMPOSITE SCORES
FREQUENCIES & PERCENTS

		Major						Total	
		CDTD		MECH		PMEC			
		Count	Col %	Count	Col %	Count	Col %	Count	Col %
ACT Comp	17	2	14%	2	7%	0	0%	4	9%
	18	2	14%	2	7%	1	33%	5	11%
	19	2	14%	0	0%	1	33%	3	7%
	20	0	0%	3	11%	1	33%	4	9%
	21	1	7%	4	15%	0	0%	5	11%
	22	0	0%	3	11%	0	0%	3	7%
	23	3	21%	7	26%	0	0%	10	23%
	24	2	14%	1	4%	0	0%	3	7%
	25	1	7%	2	7%	0	0%	3	7%
	26	0	0%	1	4%	0	0%	1	2%
	27	1	7%	1	4%	0	0%	2	5%
	28	0	0%	1	4%	0	0%	1	2%
Total		14	100%	27	100%	3	100%	44	100%

MEANS & STANDARD DEVIATIONS

ACT Comp

	Major			
	CDTD	MECH	PMEC	Total
Mean	21.29	22.07	19.00	21.61
N	14	27	3	44
Std. Deviation	3.268	2.800	1.000	2.943

MECHANICAL DESIGN 2008 FA STUDENTS
ACT ENGLISH SCORES
FREQUENCIES & PERCENTS

		Major						Total	
		CDTD		MECH		PMEC			
		Count	Col %	Count	Col %	Count	Col %	Count	Col %
ACT Eng	14	1	7%	1	4%	0	0%	2	5%
	15	1	7%	1	4%	1	33%	3	7%
	16	1	7%	3	11%	0	0%	4	9%
	17	1	7%	0	0%	0	0%	1	2%
	18	0	0%	1	4%	1	33%	2	5%
	19	1	7%	3	11%	0	0%	4	9%
	20	2	14%	2	7%	0	0%	4	9%
	21	0	0%	8	30%	0	0%	8	18%
	22	2	14%	2	7%	0	0%	4	9%
	23	2	14%	2	7%	1	33%	5	11%
	24	1	7%	1	4%	0	0%	2	5%
	25	1	7%	2	7%	0	0%	3	7%
	26	1	7%	0	0%	0	0%	1	2%
	28	0	0%	1	4%	0	0%	1	2%
Total		14	100%	27	100%	3	100%	44	100%

MEANS & STANDARD DEVIATIONS

ACT Eng

	Major			
	CDTD	MECH	PMEC	Total
Mean	20.43	20.44	18.67	20.32
N	14	27	3	44
Std. Deviation	3.797	3.250	4.041	3.422

MECHANICAL DESIGN 2008 FA STUDENTS
ACT MATHEMATICS SCORES
FREQUENCIES & PERCENTS

		Major						Total	
		CDTD		MECH		PMEC			
		Count	Col %	Count	Col %	Count	Col %	Count	Col %
ACT Math	16	0	0%	0	0%	1	33%	1	2%
	17	1	7%	0	0%	0	0%	1	2%
	18	3	21%	0	0%	1	33%	4	9%
	19	0	0%	2	7%	1	33%	3	7%
	20	0	0%	2	7%	0	0%	2	5%
	21	4	29%	1	4%	0	0%	5	11%
	22	0	0%	2	7%	0	0%	2	5%
	23	0	0%	4	15%	0	0%	4	9%
	24	1	7%	3	11%	0	0%	4	9%
	25	2	14%	2	7%	0	0%	4	9%
	26	2	14%	9	33%	0	0%	11	25%
	27	0	0%	1	4%	0	0%	1	2%
	28	1	7%	0	0%	0	0%	1	2%
	31	0	0%	1	4%	0	0%	1	2%
Total		14	100%	27	100%	3	100%	44	100%

MEANS & STANDARD DEVIATIONS

ACT Math

	Major			
	CDTD	MECH	PMEC	Total
Mean	22.07	24.04	17.67	22.98
N	14	27	3	44
Std. Deviation	3.583	2.766	1.528	3.400

MECHANICAL DESIGN 2008 FA STUDENTS
ACT READING SCORES
FREQUENCIES & PERCENTS

		Major						Total	
		CDTD		MECH		PMEC			
		Count	Col %	Count	Col %	Count	Col %	Count	Col %
ACT Reading	12	0	0%	1	4%	0	0%	1	2%
	14	1	7%	0	0%	0	0%	1	2%
	15	1	7%	1	4%	0	0%	2	5%
	16	1	7%	3	11%	1	33%	5	11%
	17	0	0%	2	7%	0	0%	2	5%
	18	3	21%	2	7%	0	0%	5	11%
	19	0	0%	2	7%	0	0%	2	5%
	20	1	7%	0	0%	0	0%	1	2%
	21	3	21%	3	11%	0	0%	6	14%
	22	0	0%	2	7%	0	0%	2	5%
	23	1	7%	1	4%	2	67%	4	9%
	24	0	0%	2	7%	0	0%	2	5%
	25	1	7%	2	7%	0	0%	3	7%
	26	0	0%	1	4%	0	0%	1	2%
	27	1	7%	2	7%	0	0%	3	7%
	29	1	7%	1	4%	0	0%	2	5%
	30	0	0%	1	4%	0	0%	1	2%
	35	0	0%	1	4%	0	0%	1	2%
Total		14	100%	27	100%	3	100%	44	100%

MECHANICAL DESIGN 2008 FA STUDENTS
ACT SCIENCE REASONING SCORES
FREQUENCIES & PERCENTS

		Major						Total	
		CDTD		MECH		PMEC			
		Count	Col %	Count	Col %	Count	Col %	Count	Col %
ACT Science	16	0	0%	1	4%	0	0%	1	2%
	18	0	0%	0	0%	1	33%	1	2%
	19	1	7%	1	4%	1	33%	3	7%
	20	1	7%	0	0%	0	0%	1	2%
	21	4	29%	4	15%	0	0%	8	18%
	22	1	7%	2	7%	1	33%	4	9%
	23	1	7%	7	26%	0	0%	8	18%
	24	2	14%	3	11%	0	0%	5	11%
	25	2	14%	4	15%	0	0%	6	14%
	26	1	7%	3	11%	0	0%	4	9%
	27	1	7%	2	7%	0	0%	3	7%
Total		14	100%	27	100%	3	100%	44	100%

MEANS & STANDARD DEVIATIONS

ACT Science

	Major			
	CDTD	MECH	PMEC	Total
Mean	22.79	23.26	19.67	22.86
N	14	27	3	44
Std. Deviation	2.424	2.474	2.082	2.548

3.A.2.b What are the range and average GPA's of students graduating from the program? Comment on this data?

Comment:

Please see University data supporting information. The data reflects the ability of the Ferris CDTD program to attract a diverse student and wide range of academics.

Ferris State University
APR Graduated 2003-04 Through 2007-08
Average GPA

TE
CAD Drafting/Tool Design Tech
AAS

		FSU GPA	
Year	Average GPA	Min. GPA	Max. GPA
2003-2004	3.03	2.289	3.952
2004-2005	2.90	2.378	3.464
2005-2006	2.86	2.065	3.549
2006-2007	3.10	2.191	3.78
2007-2008	2.91	1.995	3.92

3.A.2.c In addition to ACT and GPA, identify and evaluate measures that are used to assess the quality of students entering the program.

Comments: Students entering the Ferris CDTD program must also meet University and College of Engineering Technology entrance requirements.

3.A.2.d Identify academic awards (e.g., scholarships for fellowships) have students in the program have earned? Comment on the significance of these awards to the program and students.

Comments:

The CDTD program offers "Outstanding Student" and "Bulldog" award to both our first year and second year students. This is awarded at the annual awards luncheon with parents present. The students are very proud of their achievement.

3.A.2.e What scholarly / creative activities (e.g., symposium presentation, other presentations or awards) have students in the program participated in? Comment on the significance of these activities to the program and students.

Comment:

Faculty member Dan Wanink works with students for competition in Skills USA. For the pass five years our students have placed first or second in the regional finals and third in the national finals.

Also, faculty member Dan Wanink has helped with the Rube Goldberg Machine Contest. Our CDTD graduate was on the 2007 national championship held at Purdue University. They also appeared on Jimmy Kimmel show.

Two young ladies from our program volunteered for nonprofit organizations in Big Rapids. The organizations included Project Starburst, Mid-Michigan Community Action Agency, Mecosta County 4-H, Susan P. Wheatlake Cancer and Wellness Center, and Big Brothers Big Sisters.

CDTD students Luke Hedman and Zac Salisburg have done volunteer work in Central America and the Mexico.

3.A.2.f What are other accomplishments of students in the program? Comment on the significance of these accomplishments to the program and students.

Comment:

Several of our students participate in the University recognized Assocation of Tool Designers. They are invovled with social activities, community volunteered programs, tours and field trips.

3.A.3 EMPLOYABILITY OF STUDENTS

3.A.3.a How many graduates have become employed full-time in the field within one year of receiving their degree? Comment on this data.
Comment: 100%. The need for skilled designers and CAD operators in virtually all industries is desperate. In addition, about 60% of our CDTD graduates continue their education at Ferris to increase employment opportunities. Also see Section 2.B. Employee Follow-up Survey.

3.A.3.b What is the average starting salary of graduates who become employed full-time in the field since last program review? Compare with regional or national trends.
Comment:
See University data below.

	FY 03/04	FY 04/05	FY 05/06	FY 06/07	FY 07/08
Placement of Graduates	100%	100%	100%	100%	100%
Average Starting Salary	$34,297	$36987	$39,244	n.a.	n.a.

2005/2006 Graduate Follow-Up Survey Summary

College: Technology

	Degrees				Placement Information			
TECHNOLOGY	CERT	AS	BS	TOTAL	# Responded	% Response	Placement Rate	Ave Salary
ARCHITECTURAL TECH & FACILITIES MGMT								
Architectural Technology		17		17	11	65%	100%	$ 32,477
Facilities Management	1		12	13	6	46%	100%	$ 32,916
AUTOMOTIVE								
Automotive Body		14		14	10	71%	100%	$ 37,409
Automotive Engineering Technology			28	28	15	54%	100%	$ 36,211
Automotive Service Technology		83		83	56	67%	98%	$ 39,608
Performance Machining	23			23	5	22%	100%	$ 37,930
Performance Motorsports	31			31	6	19%	100%	$ 35,469
CONSTRUCTION TECHNOLOGY & MGMT								
Building Construction Technology		43		43	25	58%	100%	$ 37,334
Civil Engineering Technology		14		14	5	36%	100%	$ 36,678
Construction Administration	18			18	4	22%	100%	$ 42,933
Construction Management			61	61	26	43%	96%	$ 59,601
ELECTRONICS/CNS								
Computer Networks & Systems			10	10	4	40%	100%	$ 39,315
Electrical Power Generation	3			3	1	33%	NA	NA
Electrical/Electronics Engineering			7	7	4	57%	100%	$ 34,516
Industrial Electronics Technology		15		15	7	47%	100%	$ 37,064
HEAVY EQUIPMENT								
Automotive & Heavy Equip Mgmt			31	31	16	52%	100%	$ 36,994
Heavy Equipment Service Engr Tech			11	11	6	55%	100%	$ 54,648
Heavy Equipment Technology		23		23	16	70%	100%	$ 39,007
HVACR								
HVACR Engineering Technology			35	35	27	77%	100%	$ 53,930
HVACR Technology		31		31	25	81%	100%	$ 42,876
MANUFACTURING ENGINEERING								
Manufacturing Engineering Technology			23	23	13	57%	100%	$ 61,802
Manufacturing Tooling Technology		17		17	9	53%	100%	$ 39,071
Quality Engineering Technology			3	3	2	67%	100%	NA
Quality Technology	20			20	4	20%	100%	$ 38,954
MECHANICAL DESIGN								
CAD Drafting & Tool Design Technology		21		21	15	71%	100%	$ 39,244
Mechanical Engineering Technology		31	18	49	27	55%	100%	$ 40,970
Product Design Engineering Technology			32	32	13	41%	100%	$ 61,379
PLASTICS & RUBBER ENG TECHNOLOGY								
Plastics Engineering Technology			32	32	17	53%	100%	$ 56,900
Plastics Technology		25		25	18	72%	100%	$ 51,633
Rubber Engineering Technology			8	8	4	50%	100%	$ 58,759
Rubber Technology		3		3	2	67%	100%	$ 46,908
PRINTING & IMAGING TECHNOLOGY MGMT								
New Media Printing & Publishing			6	6	3	50%	100%	$ 40,880
Printing & Digital Graphic Imaging		25		25	14	56%	100%	$ 39,738
Printing Management			12	12	6	50%	100%	$ 43,227
SURVEYING ENGINEERING								
Geographic Information	8			8	2	25%	100%	NA
Surveying Engineering			20	20	14	70%	100%	$ 44,093
Surveying Technology		17		17	11	65%	91%	$ 39,802
WELDING ENGINEERING TECHNOLOGY								
Welding Engineering Technology			33	33	28	85%	100%	$ 59,630
Welding Technology		24		24	15	63%	100%	$ 53,874
Technology TOTAL	**104**	**403**	**382**	**889**	**492**	**55%**	**99%**	**Not calculated**

2004/2005 Graduate Follow-Up Survey Summary

College: Technology

	Degrees			Placement Information		
TECHNOLOGY	**CERT**	**AS**	**BS**	**% Response**	**Placement Rate**	**Ave Salary**
ARCHITECTURAL TECH & FACILITIES MGMT						
Architectural Technology		28		54%	100%	$ 30,459
Facilities Management	3		5	50%	100%	$ 31,594
Field Engineering	1			0%	NA	NA
AUTOMOTIVE						
Automotive Body		13		62%	100%	$ 35,781
Automotive Engineering Technology			17	59%	100%	$ 35,752
Automotive Service Technology		63		57%	97%	$ 37,144
Performance Machining	8			13%	100%	NA
Performance Motorsports	24			33%	100%	$ 32,866
CONSTRUCTION TECHNOLOGY & MGMT						
Advanced Construction Management	8			50%	100%	$ 52,764
Building Construction Technology		43		79%	100%	$ 34,126
Civil Engineering Technology		12		58%	100%	$ 31,429
Construction Management			47	62%	97%	$ 56,784
ELECTRONICS/CNS						
Computer Networks & Systems			8	13%	100%	NA
Electrical Power Generation	1			0%	NA	NA
Electrical/Electronics Engineering			18	50%	100%	$ 32,961
Industrial Electronics Technology		3		33%	100%	NA
HEAVY EQUIPMENT						
Automotive & Heavy Equip Mgmt			36	39%	93%	$ 35,766
Heavy Equipment Service Engr Tech			9	33%	100%	$ 51,633
Heavy Equipment Technology		19		53%	100%	$ 37,125
HVACR						
HVACR Engineering Technology			29	52%	100%	$ 50,147
HVACR Technology		22		50%	100%	$ 39,560
MANUFACTURING ENGINEERING						
Manufacturing Engineering Technology			24	50%	100%	$ 58,975
Manufacturing Tooling Technology		17		53%	100%	$ 37,544
Quality Engineering Technology			2	50%	100%	NA
Quality Technology	13			20%	100%	NA
MECHANICAL DESIGN						
CAD Drafting & Tool Design Tecnology		21		66%	100%	$ 36,987
Mechanical Engineering Technology		17	16	67%	100%	$ 39,879
Product Design Engineering Technology			23	61%	100%	$ 57,699
PLASTICS & RUBBER ENG TECHNOLOGY						
Plastics Engineering Technology			45	51%	100%	$ 54,163
Plastics Technology		32		62%	100%	$ 48,110
Rubber Engineering Technology			5	20%	100%	NA
Rubber Technology		7		57%	100%	$ 39,842
PRINTING & IMAGING TECHNOLOGY MGMT						
New Media Printing & Publishing			6	50%	100%	$ 38,499
Printing & Digital Graphic Imaging		17		53%	100%	$ 35,966
Printing Management			12	50%	100%	$ 41,650
SURVEYING ENGINEERING						
Geographic Informaiton	7			14%	100%	NA
Surveying Engineering			19	53%	90%	$ 39,763
Surveying Technology		8		50%	100%	$ 34,951
WELDING ENGINEERING TECHNOLOGY						
Welding Engineering Technology			24	66%	100%	$ 55,742
Welding Technology		30		87%	100%	$ 49,611
Technology TOTAL	**65**	**352**	**345**	**49%**	**99%**	**Not calculated**

2003/2004 Graduate Follow-Up Survey Summary

Colleges: Technology

	Degrees			Placement Information		
TECHNOLOGY	**CERT**	**AS**	**BS**	**% Response**	**Placement Rate**	**Ave Salary**
ARCHITECTURAL TECH & FACILITIES MGMT						
Architectural Technology		16		50%	100%	$ 29,394
Facilities Management	8		15	43%	100%	$ 30,640
AUTOMOTIVE						
Automotive Body		18		67%	100%	$ 34,050
Automotive Engineering Technology			17	65%	98%	$ 33,100
Automotive Service Technology		49		78%	100%	$ 36,940
Performance Machining	12			17%	100%	NA
Performance Motorsports	15			33%	100%	NA
CONSTRUCTION TECHNOLOGY & MGMT						
Advanced Construction Management	1			0%	NA	NA
Building Construction Technology		53		77%	100%	$ 32,982
Civil Engineering Technology		14		50%	100%	$ 29,710
Construction Administration	14			21%	100%	NA
Construction Management			45	51%	96%	$ 45,983
ELECTRONICS/CNS						
Computer Networks & Systems			9	33%	100%	NA
Electrical Power Generation	8			25%	100%	NA
Electrical/Electronics Engineering			14	64%	100%	$ 31,614
Industrial Electronics Technology		15		70%	100%	$ 33,691
HEAVY EQUIPMENT						
Automotive & Heavy Equip Mgmt			33	39%	92%	$ 34,710
Heavy Equipment Service Engr Tech			14	50%	100%	$ 49,833
Heavy Equipment Technology		29		66%	100%	$ 36,940
Komatsu Equipment Repair	1			0%	NA	NA
HVACR						
HVACR Engineering Technology			21	43%	100%	$ 49,320
HVACR Technology		27		50%	100%	$ 38,411
MANUFACTURING ENGINEERING						
Manufacturing Engineering Technology			28	50%	100%	$ 56,700
Manufacturing Tooling Technology		17		47%	100%	$ 34,010
Quality Engineering Technology			5	40%	100%	NA
Quality Technology	10			20%	100%	NA
MECHANICAL DESIGN						
CAD Drafting & Tool Design Tecnology		28		72%	100%	$ 34,297
Mechanical Engineering Technology		22	11	58%	100%	$ 38,460
Product Design Engineering Technology			30	50%	100%	$ 51,699
PLASTICS & RUBBER ENG TECHNOLOGY						
Plastics Engineering Technology			58	47%	100%	$ 52,005
Plastics Technology		30		33%	100%	$ 47,154
Rubber Engineering Technology			15	40%	100%	$ 41,063
Rubber Technology		11		36%	100%	$ 38,710
PRINTING & IMAGING TECHNOLOGY MGMT						
New Media Printing & Publishing			5	40%	100%	NA
Printing & Digital Graphic Imaging		18		33%	100%	$ 34,764
Printing Management			8	50%	75%	NA
Printing Technology		2		50%	100%	NA
SURVEYING ENGINEERING						
Surveying Engineering			15	60%	89%	NA
Surveying Technology		4		50%	100%	NA
WELDING ENGINEERING TECHNOLOGY						
Welding Engineering Technology			26	71%	100%	$ 54,920
Welding Technology		26		85%	100%	$ 47,966
Technology TOTAL	**69**	**379**	**369**	**49%**	**99%**	**Not calculated**

3.A.3.c How many graduates have become employed as part-time or temporary workers in the field within one year of receiving their degree? Comment on this data.

Comment:

Unknown. Typically program graduates are hired as full-time employees. No information has been provided to the department pertaining to part-time employment for the program graduates.

3.A.3.d Describe the career assistance available to the students. What is student perception of career assistance?

Comment:

The CDTD faculty are contacted regularly by companies and individuals seeking employees. Contact is either by telephone, facsimile, email and on-campus Career Fairs. This employment information is sent to faculty and students via email and job posting board located in Swan 504 lab. Students are fully aware of this process. Inquiries coming directly to the department are also forwarded to the Student Employment and Career Service Office to be posted electronically for current and registered program alumni to review. Facilities for on-campus interviews are available and utilized by visiting recruiting companies.

Career guidance is done on an individual basis through a variety of mechanisms. The University support is through the Student Employment and Career Services Office. Information can found at the Ferris web link.

3.A.3.e How many graduates continue to be employed in the field? Comment on this data.

Comment:

The data for this information has not been officially obtained. It is expected that program alumni remain in the CAD and design field in one capacity or another. The current demand for CAD and design makes it relativity easy to change employment positions.

3.A.3.e Describe and comment on the geographic distribution of employed graduates.

Comment:

Mainly the Great Lakes region. Alumni are located in nine states.

3.A.3.g How many students and /or graduates go on for additional training?

Comment:

Approximately 60% of our CDTD students that graduate with A.A.S. degrees continue their education at Ferris in a four year program.

3.A.3.h Where do most students and / or graduates obtain their additional educational training?

Comment:

Ferris State University

3.B. ENROLLMENT

3.B.1 What is the anticipated fall enrollment for the program?

Comment:

As of February 10, 2009 the CAD Drafting & Tool Design Program has had 47 applications and 29 admits. This is an increase of 21% over last year. Typically we add additional students by Fall.

Ferris State University
Administrative Program Review 2006
College of Technology
CAD Drafting & Tool Design Technology AAS

Student Enrollment

	Fall 2002			Fall 2003			Fall 2004			Fall 2005			Fall 2006		
	On	Off	Total	On	Off	Total	On	Off	Total	On	Off	Total	On	Off	Total
Freshman Headcount	40		**40**	37		**37**	25		**25**	38		**38**	30		**30**
Freshman SCH's	626		**626**	571		**571**	368		**368**	585		**585**	456		**456**
Sophomore Headcount	26		**26**	37		**37**	34		**34**	17		**17**	24		**24**
Sophomore SCH's	378		**378**	547		**547**	534		**534**	258		**258**	385		**385**
Junior Headcount	8		**8**	12		**12**	9		**9**	15		**15**	5		**5**
Junior SCH's	116		**116**	164		**164**	126		**126**	203		**203**	72		**72**
Senior Headcount			**0**			**0**	2		**2**	2		**2**	1		**1**
Senior SCH's			**0**			**0**	29		**29**	25		**25**	12		**12**
TOTAL HEADCOUNT	74		**74**	86		**86**	70		**70**	72		**72**	60		**60**
TOTAL SCH's	1120		**1120**	1282		**1282**	1057		**1057**	1071		**1071**	925		**925**

Graduates

	Academic Yr 01/02			Academic Yr 02/03			Academic Yr 03/04			Academic Yr 04/05			Academic Yr 05/06		
	On	Off	Total	On	Off	Total	On	Off	Total	On	Off	Total	On	Off	Total
Number of Graduates	22		**22**	15		**15**	29		**29**	21		**21**	21		**21**

Ferris State University
Administrative Program Review 2006
College of Technology

Pre-CAD Drafting & Tool Design Technology AAS

Student Enrollment

	Fall 2002			Fall 2003			Fall 2004			Fall 2005			Fall 2006		
	On	Off	Total	On	Off	Total	On	Off	Total	On	Off	Total	On	Off	Total
Freshman Headcount			0			0	2		2	1		1			0
Freshman SCH's			0			0	28		28	13		13			0
Sophomore Headcount			0			0			0			0			0
Sophomore SCH's			0			0			0			0			0
Junior Headcount	2		2			0			0			0			0
Junior SCH's	15		15			0			0			0			0
TOTAL HEADCOUNT	2		2			0	2		2	1		1			0
TOTAL SCH's	15		15			0	28		28	13		13			0

Graduates

	Academic Yr 01/02			Academic Yr 02/03			Academic Yr 03/04			Academic Yr 04/05			Academic Yr 05/06		
	On	Off	Total	On	Off	Total	On	Off	Total	On	Off	Total	On	Off	Total
Number of Graduates			0			0			0			0			0

3.B.2 Have enrollment and student credit hour production (SCH) increased or decreased since the last program review? Supply table and comment on enrollment trends.

Comment:

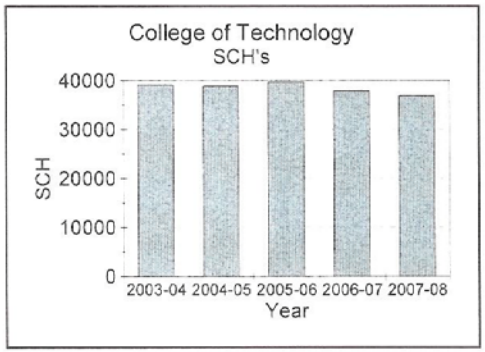
See attached University data SCH production has decreased since last program review. This is a bit odd since we loss a faculty member. We have recently rearranged our hours to improve this situation.

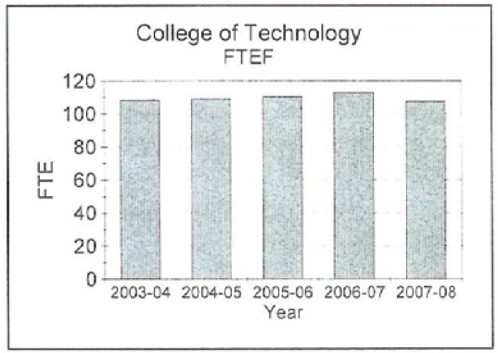
Ferris State University

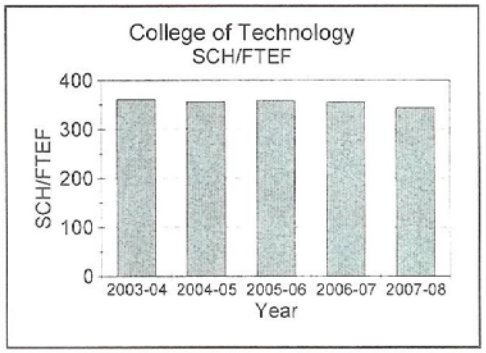
Student Credit Hours (SCH), Full Time Equated Faculty (FTEF) and SCH/FTEF Aggregated by College

Fall and Winter Terms Combined

College of Technology







Year	SCH	FTEF	SCH/FTEF
2003-04	39,117.00	108.49	360.57
2004-05	38,864.00	109.11	356.20
2005-06	39,642.00	110.46	358.88
2006-07	37,882.00	112.91	355.50
2007-08	36,881.00	107.42	343.32

Caution: When viewing graphs, please note the differences in scales

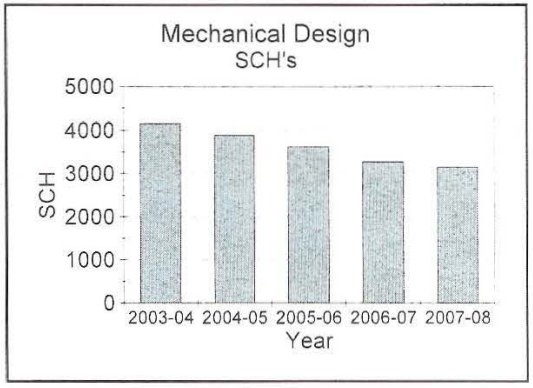
Source: Office of Institutional Research, g:\...\facload\0708\prdtegr.rsl

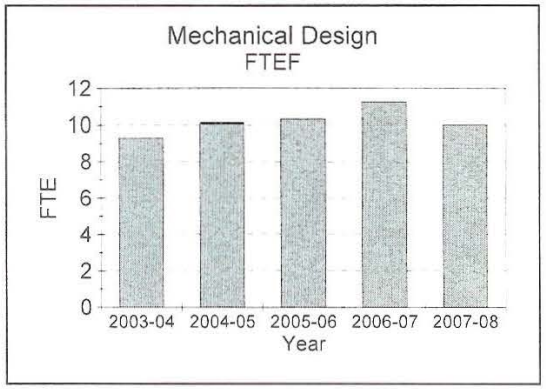
Ferris State University

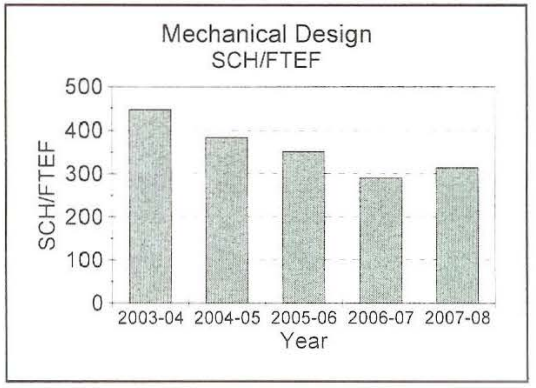
Student Credit Hours (SCH), Full Time Equated Faculty (FTEF) and SCH/FTEF Aggregated by Department

Fall and Winter Terms Combined

Mechanical Design
(College of Technology)







Year	SCH	FTEF	SCH/FTEF
2003-04	4,154.00	9.30	446.60
2004-05	3,882.00	10.10	384.29
2005-06	3,623.00	10.31	351.36
2006-07	3,268.00	11.26	290.25
2007-08	3,144.00	10.02	313.85

Student Credit Hours - On, Off, and Total

Term	Fresh On	Fresh Off	Fresh Tot	Soph On	Soph Off	Soph Tot	Junior On	Junior Off	Junior Tot	Senior On	Senior Off	Senior Tot	1st Prof On	1st Profl Off	1st Prof Total	Mast On	Mast Off	Mast Tot
200408	368	0	368	534	0	534	126	0	126	29	0	29	0	0	0	0	0	0
200508	585	0	585	258	0	258	203	0	203	25	0	25	0	0	0	0	0	0
200608	456	0	456	385	0	385	72	0	72	12	0	12	0	0	0	0	0	0
200708	344	0	344	395	0	395	30	0	30	0	0	0	0	0	0	0	0	0
200808	345	0	345	355	0	355	31	0	31	0	0	0	0	0	0	0	0	0

Prefix	Year	Student Credit Hours				Full Time Equated Faculty				SCH/FTEF			
		Summer	Fall	Winter	F + W (a)	Summer	Fall	Winter	Avg F + W (b)	Summer	Fall	Winter	F + W (a / b)
College of Technology													
Manufacturing Engineering Technology													
MATL	2003-04	0.00	540.00	309.00	849.00	0.00	1.20	1.08	1.14		450.00	285.23	743.65
MATL	2004-05	57.00	515.00	232.00	747.00	0.25	1.40	0.88	1.14	228.00	367.86	263.30	654.94
MATL	2005-06	0.00	509.00	230.00	739.00	0.00	1.40	0.97	1.19		363.57	236.15	622.59
MFGE	2003-04	170.00	1,334.00	1,097.00	2,431.00	1.20	5.96	5.83	5.89	141.67	223.70	188.27	412.38
MFGE	2004-05	162.00	1,229.00	1,120.00	2,349.00	1.17	5.64	5.70	5.67	138.46	217.91	196.53	414.33
MFGE	2005-06	180.00	1,255.00	1,221.00	2,476.00	0.95	5.51	6.53	6.02	189.47	227.63	187.00	411.20
MFGE	2006-07	200.00	0.00	0.00	0.00	1.84	0.00	0.00	0.00	108.70			
MFGT	2003-04	0.00	656.00	580.00	1,236.00	0.00	5.50	5.55	5.52		119.37	104.50	223.80
MFGT	2004-05	0.00	644.00	614.00	1,258.00	0.00	5.08	5.25	5.16		126.79	116.95	243.58
MFGT	2005-06	2.00	683.00	582.00	1,265.00	0.00	3.71	5.51	4.61		184.01	105.69	274.45
MFGT	2006-07	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
Mechanical Design													
CDTD	2003-04	0.00	710.00	579.00	1,289.00	0.00	3.62	3.80	3.71		196.38	152.55	347.86
CDTD	2004-05	0.00	555.00	489.00	1,044.00	0.00	3.67	4.00	3.84		151.36	122.15	272.23
CDTD	2005-06	0.00	554.00	490.00	1,044.00	0.00	3.62	3.84	3.73		153.23	127.72	280.19
CDTD	2006-07	0.00	475.00	421.00	896.00	0.00	3.64	4.34	3.99		130.49	97.00	224.56
CDTD	2007-08	0.00	380.00	338.00	718.00	0.00	3.29	3.61	3.45		115.64	93.63	208.23

3.B.3 Since the last program review, how many students apply to the program annually?

Comment:

50-60

3.B.4 Of those who apply, how many and what percentage are admitted?

Comment:

58%

3.B.5 Of those who are admitted, how many and what percent enroll?

Comment:

68%

3.B.6 What are the program's current enrollment goals, strategy, and efforts to maintain/increase/decrease the number of students in the program?

Comment:

Maintain an annual department enrollment of 70 students.

Below are some department recruiting and marketing activities.

- Maintain department web site
- Annually promote and attend FSU COT Dawg Days
- Annually host MDEA
- Annually host spring "CAD Open House"
- Continue recruiting visits to secondary institutions
- Participate in Admissions programs
- Summer camps
- Participate in Homecoming activities
- Administer the NOCTI drafting test

3.C PROGRAM CAPACITY

3.C.1 What is the appropriate program enrollment capacity, given the available faculty, physical resources, funding, accreditation requirements, state and federal regulations, and other factors? Which of these items limits program enrollment capacity? Please explain any difference between capacity and current enrollment.
Comment: 76

3.D. RETENTION AND GRADUATION

3.D.1 Give the annual attrition rate (number and percent of students) in the program.

Comment:

Entering Fall Term	Major			Fall Term					
				Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
200208									
	CDTD	29							
			% Graduated By	0	31	48	52	55	59
			% Still Enrolled In	76	38	14	7	4	0
			% Persisters	76	69	62	59	59	59
			% Non-Persisters	24	31	38	41	41	41
			% Graduated in Prg	0	31	48	48		
			% Still Enrolled in Prg						

3.D.2 What are the program's current goals, strategy and efforts to retain students in the program?

Comment: The CDTD program strives to continuously assess whether the educational objectives of the program are well-aligned with the needs of industry and students are progressing. Assessment is done by staying in constant dialog with students, alumni and employers with regard to the program.

3.D.3 Describe and assess trends in number of degrees awarded in the program.

Comment: The table below shows the department degrees conferred.

Graduate Headcount

Academic Year	On Campus	Off Campus	Total
2003-2004	30	0	30
2004-2005	21	0	21
2005-2006	22	0	22
2006-2007	14	0	14
2007-2008	21	0	21

3.D.5 On average, how long does it take a student to graduate from the program?

Comment:

These time durations are estimates based on the fact that many factors are involved. A student may attend Ferris and take general education and/or remedial course work prior to entering the program. The best indicator of student degree obtainment could be realized from Retention to Graduation Rates found in 3.D.1.

Faculty commitment to student advising and working with students to graduate on time helps retention. Each program faculty are assigned as students advisors during enrollment. Students meet with faculty a minimum of once per semester to monitor progress in the program and build a schedule.

SECTION 8

EVALUATION OF FACILITIES AND EQUIPMENT

A. PROGRAM TASK

Evaluation of facilities and equipment: An analysis of present facilities and equipment as compared to program needs must be conducted. This analysis should also include an assessment of the availability to the program of technologies used in the workplace.

This analysis of facilities and equipment was developed after careful review of the responses to the faculty, advisory committee, and industry surveys conducted for the review of this program. The criticisms, concerns, comments, reponses, and recommendations of the respondents to the survey were given top priority in determining the state of the CAD Drafting Tool Design program's facilities, equipment and needs of technologies to continue a relevant program of instruction. Many of these needs have been previously identified in Unit Action Plans and/or minor capital improvement recommendations and some have been introduced here for the first time based on the responses to the survey. Our goal is to create a pleasant and professional environment for our students.

B. SUMMARY OF FACILITIES AND EQUIPMENT:

1. Classrooms and Laboratories:

2. Classrooms:

3. Heating, Ventilation and Air Conditioning:

4. Lighting and Controls:

5. Seating

6. Printers/Plotters:

7. Present Equipment General:

8. Computer Hardware:

9. Computer Software

10. Lecture Station

11. Projection systems

12. Grading Technologies Facilities

C: AVAILABILITY OF TECHNOLOGIES:

1. CAD software for modeling:

2. Rapid Prototyping:

3. Multi-media Presentations:

4. Scanning Equipment

5. Demonstration Equipment:

D. Equipment and Lab General

1. Cleanliness of Labs
2. Replacement of Computers
3.

SECTION 4 (Faculty Responses)

EVALUATION OF FACILITIES AND EQUIPMENT

SUMMARY OF FACILITIES AND EQUIPMENT:

1. Classrooms and Laboratories:
    a. Our classrooms are reasonable. I feel that they need to have updated storage cabinets and a furniture upgrade in Swan 503 and 502.
    b. OK
    c. SWN 503 classroom wiring detracts from a clean and neat (normal) appearance. Spacing of isles to reach student's computers is too narrow, entrance and egress is problematic (bumping into monitors, pulling power cord out, disconnecting internet etc.)

2. Classrooms:
    a. See above
    b. 502 has not been finished
    c. See above

3. Heating, Ventilation and Air Conditioning:
    a. Swan 503 needs to have a wall mount A/C unit installed and the window units removed. It is nearly impossible to lecture over the noise of the window units. Swan 502 should also have a wall mount unit installed. Swan 501 needs air conditioning due to equipment sensitivity. Environment and a window mount unit would resolve this issue easily.
    b. Good
    c. Heat generated by computers exceeds the normal air movement of the classroom in terms of fresh air. The A/C units are too loud; lecturing is a problem for normal classroom communication.

4. Lighting and Controls:
    a. OK
    b. OK
    c. Very good

5. Seating:
    a. In 504 and 503 our seating is outstanding. 502 needs to have all furniture replaced.
    b. Good except for 502
    c. Seating is fine

6. Printers/Plotters:
    a. I feel that we need to address the issue of a consistent replacement timeframe for all printers and plotters. Swan 503 will soon need to be replaced and we have no way to pay for new ones without one time funding or vocational education dollars. The trouble with these is there is no planning or consistent cycle of funding.
    b. Could use faster plotting capabilities
    c. Plotting equipment is minimal, the speed presents plotting timing issues when projects are due. B/W Printers are OK. Cost of the color printer is excessive and causes budget problems, as it is misused for non-color uses.

7. Present Equipment General:
    a. No Comment
    b. No Comment
    c. No Comment

8. Computer Hardware:
    a. This has been a constant issue with us as with any piece of consumable equipment. We have never had a consistent replacement budget or cycle for replacement. Our computers in Swan 504 are always taxed due to software programs requiring more "horsepower" than has been purchased. We have always gone with the minimum specs required and within a year they are underpowered. This is extremely frustrating to students who expect a quality system that doesn't crash.
    b. OK
    c. NO plan for replacement of computers. Furthermore, the monies NEVER provide for a normal CAD configuration (Video card type, video memory, and RAM). Limiting the computer capabilities, severely limits the ability of students to do some industry and advisory committee requirements (specifically animation, complex assemblies and CAE).

9. Computer Software
    a. I feel the faculty has done an excellent job soliciting software vendors to reduce the cost to the university while enhancing the capabilities of the students in our design courses. I would like to see the program add die simulation software to enhance our students understanding of forming.
    b. Great
    c. Software is fine.

10. Lecture Stations :
    a. The comfort level of the lecture stations is fine but the appearance has much to be desired. For example the tops need to be replaced as the duct tape holding the cracked laminate on is very poor in appearance and a cord management system needs to be installed.
    b. OK
    c. Lecture stations are wearing out, but are functional. Appearance is rough especially when the wiring is exposed.

11. Projection systems :
    a. Our overhead systems are finally up to code but we had to beg, borrow, and steal to get them which once again bring me back to the lack of a replacement budget to plan for future spending. I would also like to see each classroom equipped with an "ELMO" projection system.
    b. Better now.
    c. The hand-me-down lucky-to-find projectors are nice, but a planned approach for replacement would be nice. The lumen level is not too great but works on the cheap.

12. Grading Technologies Facilities:
    a. No Comment
    b. No Comment
    c. I do not use them, other than Ferris Connect.

AVAILABILITY OF TECHNOLOGIES:

1. CAD software for modeling:
    a. Add a die simulation package (AutoForm)
    b. Nice
    c. Fine.

2. Rapid Prototyping:
    a. Would like to see this area expanded to a second additive prototype machine. Would like to get a subtractive machine.
    b. No comment
    c. The Rapid Prototyping capabilities are underutilized. They are sufficient for current coursework.

3. Multi-media Presentations:
    a. ELMO as listed above
    b. Works OK
    c. Ability to create and capture animations and play them in different formats is needed.

4. Scanning Equipment:
    a. When we had Voc Ed. money this past year we were not able to purchase the type of non-contact scanning equipment and software desired due to the fact that our monies had to be spent on computer replacement. The scanning unit that we had to purchase was all we could afford and is very limited in the capabilities that all of our programs could be using.
    b. No comment.
    c. Scanning equipment is sufficient for current coursework.

5. Demonstration Equipment:
    a. We have a need for demo equipment to help take the abstract concept of fits of fasteners, components, and GD & T concepts.
    b. No comment
    c. Need several demo capabilities: Mold Lifters, Slides, general components, threads and fasteners etc.

Equipment and Lab General:

1. Cleanliness of Labs:
    a. We would like to install cabinets to store teaching examples, supplies, etc.
    b. 501 A-B need cleaning – Bad
    c. Labs are normally OK. However, the RP lab and scanning areas are usually messy and very rough in appearance. The inability to walk through with visitors is troublesome.

2. Replacement of Computers:
    a. See above
    b. Need a budget.
    c. There is a need for a serious plan to replace computers in a timely manner. CAD software applications and capabilities need to be the driving force as to the configuration, specifically RAM, Video RAM, and graphics card selection (we are not general computer users, we have special needs).

SECTION 4 (Summary)

EVALUATION OF FACILITIES AND EQUIPMENT

Responses were received from all faculty. While the facilities and equipment are functional, concerns were expressed to make for a better, more efficient, learning environment.

Significant concerns expressed include:

1. Program faculty believes that the A/C system in SWN 503 needs addressing.
2. A plan for timely replacement of projectors and computers with CAD configurations needs to be addressed when replacement is warranted.
3. Plotting equipment is marginal.
4. Lecture station needs attention as to wear and tear.
5. The 501 lab is not presentable at times.

The faculty recognizes the budget constraints on the university, however, we have petitioned for many years (before the current fiscal situation) to have a budget reconciliation of the College of Engineering Technology to help us address many of the issues stated above. There have been no positive changes since the last APR.

SECTION 4

FACILITIES AND EQUIPMENT

4.A. INSTRUCTIONAL ENVIRONMENT

4.A.1 Are current classrooms, labs, and technology (both on-campus and at off-site locations) adequate? Explain.

The CDTD program has access to classroom facilities campus-wide, as does every academic program, although particular programs have first-rights to various academic spaces. We currently have first access to the following spaces:

Swan Building Room 504: Renovation to a "State of the Art" industry setting classroom. The renovation was completed with industry donations and the Presidents funding. Room capacity of 16 students and 16 personal computer stations, with enhanced workstations and instructional technology.
Reasoning for renovation:

- Provide a design environment for our tool design students that mirrors current industry practices. "State of art learning and teaching facility"
- Utilize present facilities
- Realistic career-learning environment
- Opportunity to expand second year training, applications and teaching in Die Design, Mold Design, Tool Design and CAE.
- Expansion into summer workshops and summer camps for students, professionals and industry.
- Improved training will help meet employer needs and increase marketability, retention and recruitment.
- The facility would highlight our unique program, attracting more students that would lead to more students transferring to our BS programs. (60% continue on)

Swan Building Room 503: Location has capacity for 24 students and 24 personal computers. Instructional technology with conventional chair/desk student space.

Swan Building Room 502: Room was VPAA Classroom Renovation project in 2006. Was never completed with upgraded chairs and desks.

Classroom Renovation: Learner-Centered Design

In response to the president's initiative to create a learning-centered campus, Academic Affairs has collaborated with Physical Plant to renovate a variety of classrooms around the concept of learner-centered design.
In such a classroom, faculty aims to create an environment where students are active participants in learning, develop themselves independently and collaborate in ways that support the learning efforts of others. There is research to support such an environment. Some of the key elements that we tried to achieve through renovations are as follows:

Flexibility: Used furniture that allowed for various configurations of the classroom fostering small group, large group, or seminar capacity in one room.

Technology: Developed a campus standard for technology enhanced classrooms (computer, projector, document camera, video and DVD player) in order to maximize the learning in the classroom.

Color and comfort: The importance of comfort should not be diminished in relation to the creation of learning-centered spaces. We added vibrant colors to the lab and fifth floor. This was well received by students and picked up by the rest of the Swan Building. We added carpeting and chairs that are ergonomically supportive. In addition, we air conditioned our labs for student comfort.

Sound: The addition of carpet and replacement of ceiling tiles has reduced unnecessary and distracting sound in the classroom.

4.A.2 How does the condition of current facilities impact program delivery? Explain.
Comment:
See 4.A.1 for explanation

4.A.3 Describe the program's projected needs with respect to instructional facilities.
Comment:
See enclosed facilities survey.

4.A.4 Describe current plans for facilities improvements and indicate their status.
Comment:
See enclosed facilities survey.

4.A.5 Describe how proposed changes or improvements to facilities would enhance program delivery.
Comment:
See enclosed facilities survey.

4.B. COMPUTER ACCESS AND AVAILABILITY

4.B.1 Outside of computers in faculty and staff offices, identify the computing resources (hardware and software) that are allocated to the program.
Comment:
There are 16 workstations in Swan 504.
There are 24 PC computers in Swan 503.

4.B.2 Discuss how these resources are used.
Comment:
The computer resources are used in lecture and laboratory courses for both in class assignments and student homework. Students have access to computers in SWN 503 and SWN 504. In addition, we provide CAD software for their laptops.

4.B.3 Discuss the adequacy of these resources and identify needed additional resources.
Comment:
Current computer resources are adequate. Considerations for higher end computers needs to be addressed in terms of video ram and computer ram. Existing campus specifications do not address our needs, especially for CAE and advanced assemblies.

4.B.4 Does an acquisition plan to address these needs currently exist? Describe the plan. Has it been included in the department or college's planning documents?
Comment:
The College of Engineering Technology and our department do not have a computer acquisition plan. Past computer upgrades have occurred as computer resources become available.

4.B.5 Discuss the efficacy of online services (including WebCT) available to the program.
Comment:
FerrisCONNECT or MyFSU is used by program faculty. Each faculty uses this resource as a course supplement to varying degrees.

4.B.6 Discuss the adequacy of computer support, including the support for on-line instruction if applicable.
Comment:
The computer support resources are adequate.

4.C. OTHER INSTRUCTIONAL TECHNOLOGY

4.C.1 Identify other types of instructional technology resources that are allocated or available to the program.

Comment:

The CDTD laboratory facilities are discussed in 4A.1. In addition, we provide our our students, as well as other university students, instructional access to Swan 502A which includes the Rapid Prototyping, scanning and inspection equipment.

4.C.2 Discuss how these resources are used.

Comment:

The items are used on a daily basis for student class activities. This is a major learning environment for CDTD students.

4.C.3 Discuss the adequacy of these resources and identify needed additional resources.

Comment:

The CDTD laboratory facilities are equipped with the latest CAD software technology representing the leading industry manufactures.

4.C.4 Does an acquisition plan to address these needs currently exist? Describe the plan. Has it been included in the department or college's planning documents?

Comment:

Funding for departmental level capital equipment purchases through university resources is available. These opportunities are in the form of "One-Time" funding or Perkins Grant funding. Both of these funding opportunities are available annually. One-Time funding is a College of Engineering Technology opportunity. The funding is shared with CAD Drafting & Tool Design, Mechanical Engineering Technology, and Product Design Engineering Technology programs. The Perkins funding opportunities work much in the same way as "One-Time" funding, but are coordinated out of the Vice President of Academic Affairs Office and is campus wide. Again, our department must share funding. Our program has benefited from both of these funding mechanisms.

The CDTD program has purchased equipment from annual Supply & Expenditure (S&E) budget and program "Local Fund". The S&E funds are received from the College of Engineering Technology Dean's Office and are targeted for annual operation of the program. It has been necessary in past academic years to purchase equipment from this fund in order to continue operation of courses.

4.D LIBRARY RESOURCES

4.D.1 Discuss the adequacy of the print and electronic and other resources available through FLITE for the program.

Comment:

FLITE has both general and specific resources to support the CDTD program at FSU.

4.D.2 Discuss the service and instruction availability provided by the Library faculty and staff with respect to the needs of the program.

Comment:

Fran Rosen, FSU COT FLITE Liaison, has supported the department programs very effectively.

4.D.3 Discuss the impact of the budget allocation provided by FLITE to your program. Is the budget allocation adequate? Explain.

Comment:

Budget allocations are sufficient to support the department program needs.

Dedication of Swan 504 with company executives


LEON PLASTICS, INC.

5 D. ENROLLMENT

Enrollment has been steady over the years until the last couple of years. There have been several factors affecting student enrollment in CDTD program.

- The economic conditions in the State of Michigan has had a big impact on students attending college.
- The College of Engineering Technology has experienced reduced student numbers.
- The State of Michigan changing high school standards. This has made it harder for high school students to take CAD as elective and see if would be something they enjoyed doing. Now that several schools have changed to trimesters, this should allow more students the opportunity to get into CAD
- Ferris increasing incoming ACT scores. Having higher ACT scores does not measure a student's spacious relationship, creativity or design abilities. The math and science are good but we want students that can think more in areas that are not measured in current testing.
- The biggest concern is tuition costs. Even with the top CAD program in the state, with increased costs, it's hard to justify a two year AAS degree that has tuition costs 3-4 times community college rates. There are additional housing costs also. If Ferris State is to serve the tri-county community as its community college, why do the county residents pay a penalty for using FSU as its two year community college?

Even with these obstacles, we believe with our department recruiting and marketing activities we can still attract students to Ferris and our excellent program.

- Maintain department web site
- Annually promote and attend FSU COT Dawg Days
- Annually host MDEA
- Annually host two spring "CAD Open House"
- Continue recruiting visits to secondary institutions
- Participate in Admissions programs
- Summer camps
- Participate in Homecoming activities

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-

5 F. QUALITY OF CURRICULUM AND INSTRUCTION

CDTD students and graduates are very satisfied with the quality of education provided by the program. The entire faculty has industrial experience and continue to upgrade their skills and knowledge by attending conferences and training seminars. Based on industry, alumni and current students surveys, the curriculum content meet the needs of industry and students continuing on. The excellent careers and career responsibilities, as indicated by the graduate follow-up survey, is a testimonial of the quality and success that the CDTD graduate has obtained. The jobs and salaries graduates obtained indicate the students are well prepared to enter the workplace.

Graduates of the CDTD program indicate that they have little difficulty in obtaining employment after graduation. Starting salaries are excellent and competitive with other associate degree programs. With additional training and degrees the graduate continue to become leaders in the design field.

A list of curriculum materials are included in the APR report:

- Programmatic marketing brochure
- CDTD web location
- CDTD program curriculum guide sheet
- CDTD technical sequence course description
- Ferris State graduation check sheet General Education requirements

5A. RELATIONSHIP TO FSU MISSION

The Ferris State CAD Drafting & Tool Design program is compatible with the University mission by providing hands-on, laboratory based career education and training.
The strategic plan of the CDTD program is outlined annually in the Unit Action Planning process. The CDTD program strives to insure that our future plans align with the overall plans of the College of Engineering Technology and University.

Current Study Program Goals:

- Maintain incoming student numbers consistent with program capacity
- Assure an industry current curriculum in line with needs of the present industry today as well as in the future using appropriate methods.
- Center the educational experience around the mission of Ferris State University.
- Manage and integrate change into the program in an efficient and effective way, from curriculum to facilities to expand degree offerings.
- Assure ongoing, consistent, and relative faculty development per program/curricula needs.
- Maintain high placement and transfer percentage rates for graduates of the program.
- Maintain and expand our visibility in order to remain a key leader in supplying future design professionals.

The mission Statement of Ferris State University is as follows:

Ferris State University prepares students for successful careers, responsible citizenship, and lifelong learning. Through its many partnerships and its career-oriented, broad-based education, Ferris serves our changing global economy and society.

The CDTD program relates perfectly to the mission statement and current activities of Ferris State University. We are a high tech program which will be a vital part of getting the State of Michigan and our economy rolling again. As witnessed by the summary of the data from the surveys, our graduates are very successful in their careers, demonstrate responsibility as citizens through their commitment to recruitment of new students and many continuing their education. The curriculum remains broad-based and is structured to produce graduates that fill changing industry needs for engineering technologists.

The CDTD program is also structured currently after the Ferris State University model of a 2 + 2 program, filling the traditional trade/training model with an Associate Degree, and expanding to the educational model of selecting one of several remaining two years of a Bachelor Degree.

5B. PROGRAM VISIBILTY AND DISTINCTIVENESS

The CDTD program title is unique with no other program title found in other universities. The program provides students with the opportunity to transfer into a number of Bachelors programs. With the program being in existence for over fifty years its quality and reputation is well known throughout the state. With the program presenting at state and national conferences the program has also gained a national exposure and reputation.

The CDTD graduate provides services in tool design and the manufacturing sector on both the state and national level. With tool design being the foundation for all manufacturing process, graduates with tool design skills are highly sought after. Our graduate follow-up survey and employer survey pay tribute to the quality and reputation of the CDTD program. The skills and knowledge student gain are in high demand in industry.

Graduates of the CDTD program indicate that they have little difficulty in obtaining employment after graduation. Starting salaries are excellent and competitive with other associate degree programs. With additional training and degrees the graduates continue to become leaders in the design field.

5C. PROGRAM VISIBILITY AND DISTINCTIVENESS

The CAD Drafting & Tool Design A.A.S degree program has been providing well qualified drafters and tool designers for many facets of manufacturing and fabrication industries for many years. The demand for Ferris tool design graduates is strong and will continue to be in demand. There is a shortage of qualified designers and CAD operators facing industry due the “baby boomers” retiring. This has created a bigger job market for our graduates. In addition, many of our graduates continue their studies at Ferris in engineering and teacher education. These degrees are also in high demand.

The CDTD graduate provides services in tool design and the manufacturing sector on both the state and national level. With tool design being the foundation for all manufacturing process, graduates with tool design skills are highly sought after. Our graduate follow-up survey and employer survey pay tribute to the quality and reputation of the CDTD program.

This industry demand has resulted in steady enrollment. This enrollment benefits all aspects of the University as students are required to take courses outside the program and the College of Engineering Technology to complete their academic degree requirements.

5E. CHARACTERISTICS, QUALITY AND EMPLOYABILITY OF STUDENTS

As stated in 3.A.3, the need for skilled designers and CAD operators in virtually all industries is desperate. In addition, about 60% of our CDTD graduates continue their education at Ferris to increase their employment opportunities. Average starting salaries are given in 3.A.3.b. The range of ACT composite scores for incoming students from 2003-2008 was from 19.25 to 21.69. The average GPA score for graduating students during that peroid ranged from 2.86 to 3.10. The Alumni survey indicates that the respondents are very supportive of program requirements and supportive of the program. The Employer survey respondents were satisified with graduate performance and technical preparation for the job. The CDTD program will continue with current cirriculum development and delivery relative to the CAD and tool design foundational knowledge and skills.

5G. COMPOSITION AND QUALITY OF THE FACULTY

The CAD Drafting and Tool Design Technology faculty are highly qualified to teach in the program courses. Their dedication and concern for the students is tremendous. The loyalty to the University and program by the faculty is illustrated by their more than 50+ years of combined teaching of CDTD courses at Ferris State.

CDTD students and graduates are very satisfied with the quality of education provided by the program. The entire faculty has industrial experience and continue to update their knowledge by attending conferences and training seminars. Based on industry, alumni, and current student surveys, curriculum content meet the needs of industry and continually evaluated and improved. The excellent careers and career responsibilities, as indicated by the graduate follow-up survey, is a testimonial of the quality and success that the CDTD graduate has obtained. The jobs and salaries graduates have obtained indicate the students are well prepared to enter the workplace.

Section 5

CONCLUSIONS

Conclusions based on data analysis derived from Sections 2-4 and collective wisdom and judgment of the PRP. In arriving at these conclusions, the PRP should summarize the relationship of the program to each of the following categories.

The information contained within this section is focused on drawing conclusions from the data and information gathered during the past year and comparing the summaries of the data to the self study program goals at the start of the process.