Program Review Summary for 2002-2003
Metal Fabrication

Introduction:

The following summarizes the status and performance of the Metal Fabrication program offered at the Area Technical School for the school years 1998-1999 through 2001-2002.

Curriculum:

The curriculum of the Metal Fabrication program has followed the frameworks provided through the Instructional Materials Lab, University of Missouri-Columbia, and meet the requirements established by the Missouri Department of Elementary and Secondary Education. The curriculum is entirely competency based and teaches both cognitive and manipulative skills to students desiring to enter welding, machine tool or fabrication at the entry level. The curriculum also incorporates the concepts of applied mathematics and communications as they apply to Metal Fabrication. This curriculum is revised each year to meet the changing needs of business and industry in close consultation with a strong advisory committee.

Faculty:

Mr. Robert Rodden teaches the Metal Fabrication program. He is a 1988 graduate of Northwest High School and has an Associates in Applied Science – Welding Technology from Jefferson College. Mr. Rodden brings a total 20 years of metal fabrication and welding experience to the program and is currently in his tenth year of teaching at Jefferson College.

Student Outcomes Assessment:

The instructor is required to track student mastery of industry identified essential occupational skills, both cognitive and manipulative. This mastery is reported annually to the Missouri Department of Elementary and Secondary Education as part of the state-wide performance review. This performance is disaggregated by sending school district, gender, race and special population categories. These include disabled, academically and economically disadvantaged, and students trained in programs non-traditional to their gender. These results are evaluated by the administration and utilized as part of the criteria used in the annual "Evaluation of Vocational Education Programs" by the Area Technical School Director.

Program Status:

	2000-2001	2001-2002	2002-2003	Average
Salary & Fringe	$45,868	$46,213	$48,450	$46,844
Equipment, Supplies, Etc	$17,675	$15,531	$24,209	$19,139
Total Program Costs	$63,543	$61,744	$72,659	$65,983
Program Enrollees	24	32	36	31
Cost Per Student	$ 2,648	$ 1,930	$ 2,018	$ 2,128

Note: Equipment purchases and a portion of the supply costs were funded by Federal Perkins III funds and Vocational Technical Education Enhancement Grants.

The cost per student has shown a decrease over the three-year period. The primary reason for this decline in cost per student has been a substantial increase in enrollment (almost 30%). This cost has been reduced even with substantial increase in the purchase of equipment through Perkins III federal funds and Enhancement Grant state funds. This cost per student will continue to decrease since most of the major equipment purchases needed to bring the program, especially the laboratory, up to industry standards has been purchased.

Supply costs continue to increase an average of 15% each year, with a dramatic increase in the cost of metals, particularly steel products.

Conclusion:

The Metal Fabrication program has shown a steady improvement in enrollment and in program performance (primarily enrollments and placement of graduates). Labor market data continues to indicate that the metals related industry is among the modest growing occupations, with annual openings of 8%. Placement data for graduates indicates students are finding employment at and above the entry level. Area high schools continue to send more students than the program has capacity. Aggressive marketing strategies should ensure continued success in the program.

METAL FABRICATION PROGRAM
Program Status:

_____Program Satisfactory	_____ Program Requires Immediate Attention	_____ Program_____ Unsatisfactory

_______________________________ Division Chair Signature

_____________________ Date

VOCATIONAL
PROGRAM/DISCIPLINE REVIEW GUIDE

CRITERION 1 **Institutional Mission and Goals**

[S] A. This secondary vocational education program successfully meets the philosophy, goals and objectives established by the Jefferson College Board of Trustees. The program also exceeds the goals and objectives established for the Area Technical School, specifically: excellence, advocacy, partnerships and accountability.

CRITERION 2 **Advisory Council Involvement**

[S] A. See Attachment #1

B. See Attachment #2

C. A review of the advisory committee minutes confirms that area employers are convinced that Metal Fabrication is a viable occupation in the Jefferson County and St. Louis SMSA. Members continue to lend strong support to the program.

D. A review of the advisory committee minutes confirm that area employers believe that the Metal Fabrication will continue to be a viable program only if the technology in the program continues to keep abreast of business and industry in the area. The replacement of antiquated equipment and the recent purchase of new and innovative equipment has strengthen this resolve by local industries.

CRITERION 3 **Labor Market Data**

[S] A. Labor market data from the Missouri Occupational Information Coordinating Committee (MOICC), the Office of Social and Economic Data Analysis (OSEDA) and the U.S. Department of Labor were used in the analysis of food service related occupations in the St. Louis SMSA. Conclusions from this data include the following:

- Metal fabrication occupations, including fabricators, welders and machinist show a median increase in jobs from the period 1998-2008 of around 2%, with the range from a –17.2% for Machine Tool Cutting Operators to a high of +22.5% for CNC Operators.
- The occupational data indicates that the higher degree of training and work experience in the metal fabrication field, the higher the number of job openings and correspondingly higher wages.
- Occupations requiring few skills or little vocational-technical training are in steady decline.

CRITERION 4 **Comprehensive Needs Assessment**

[S]

A. Surveys conducted by MOICC and OSEDA indicate local businesses and industries report an increased need for metal fabrication employees, with projected growth between 3 and 7 percent. Graduates of this program were employed or continued their education at a average rate of 62.6% over the past 5 years (source: Annual report to DESE – 1997-2001).

CRITERION 5 **LEA (Local Education Agency) Needs Assessment**

[S]

A. Program enrollment has been steadily high in Metal Fabrication over the past five (5) years. The maximum enrollment is 36 students in two sections. Enrollment has been at 32 students or higher 4 of the last 5 years.

B. Area high schools have expressed a high interest in the Metal Fabrication program as evidenced by the referral of more than 15% more students than the capacity of the program. The program continues to receive accolades from the administrative, counseling and teaching staffs of area high schools.

C. Administrations of LEAs continue to demonstrate support by increasing enrollment each year, despite experiencing difficult economic times locally.

CRITERION 6 Curriculum Analysis

A. The courses currently involved in the Metal Fabrication. Program are as follows: Welding, Machine Tool, Sheet Metal, Mathematics, and Communications.

B. The content of the courses in terms of scope are as follows: Welding involves teaching the student how to properly use oxyacetylene torch, properly lay out metal and cut to size, plasma cut, properly weld using GMAW, SMAW, and GTAW processes. Machine Tool involves teaching of the proper use of engine lathes, vertical mills, boring, drilling, facing, turning, beveling, countersinking, and tapping, properly lay out and machine metal and cut to size.
Sheet Metal involves proper use of tin snips, sheet metal brakes, sheet metal shears, the proper way to handle sheet metal, measuring devices, aviation snips, pattern layouts, scratch all uses, and techniques for pattern development. Math involves the mathematics related to sheet metal, machine tool, and welding. Communications deals with the aspect of writing letters, memos, applications, and requests similar to that of someone in this industrial field.

C. The textbooks in the classroom are Modern Metal Working, Technology of Machine Tools, Welding Principles, and Applications Fifth Edition. All books are sufficient for the teaching and learning process, providing a wide degree of information in all related fields. The machine tool and the welding texts are college level text books. Welding program currently uses the Welding principles text. The theory is that the student will have been introduced to the college level materials and will be better acclimated with it when the student graduates.

D. The advisory committee reviews and assists in the update of all curriculum materials each year.

E. Sequencing of the courses is as follows: Metal Fabrication is offered five days a week. Two days there is a 1 hr. class followed by a 1 hr. Communications Class, some students on these days also attend the mathematics class, with no metals. On some days of the week there will be a 2 block of Metal Fabrication.

F. In the last two academic years the college has worked closely with Mr. Rodden to accomplish goals set not only by the advisory committee but also by the instructor and the administration. The necessary equipment has been added to help keep the program on the cutting edge of technology. The items listed below were added to benefit the students and the program; to which both have profited immensely.

- Plasma cutter, Hypertherm
- Miller model 251 (used for GMAW of plate)
- 4' hydraulic press brake, this is used to bend heavy gauge materials.
- The use of fuels other than acetylene for cutting is being used. The program utilizes polypropylene for cutting parts out of full sheets.
- 6' hydraulic shear this allows the student to cut heavy gauge materials similar to industry

G. None

H. A current course syllabus is currently on file with the Dean of Vocational Education office and the Director of the Area Technical School.

I. Instruction used in this class is as follows classroom lecture and theory, and research from the textbooks. The students work in the lab on their assigned competencies.

CRITERION 7 **Instructional Analysis**

[S]

A. The Instructor Robert Rodden has the following credentials: certificate in Welding Technology and an Associates of Arts Degree in Welding. He has completed work for a 99 year vocational teaching certificate in Welding Technology. He has taught Metal Fabrication for 10 years, and has also taught 14 semesters of Customized Training for Jefferson College. He has also taught college level Welding Technology for approximately one and a half years.

B. Mr. Rodden is an effective teacher and has made an excellent transition from industry to the classroom. Mr. Rodden keeps himself abreast of current trends in industry by reading related literature, talking to members of his advisory committee, and speaking with persons in related fields. He has proven to be a contributing member of the Area Technical School team. Mr.

Rodden has been instrumental in implementing cost saving measures that have resulted in significant savings for the college. He has contributed to several projects throughout the campus which have assisted other vocational and academic programs save significant funds.

C. Mr. Rodden is the only instructor for the Metal Fabrication Program. His methodology includes: classroom theory, real world problem solving related to metal fabrication, teaching manipulative skills, one on one project interaction, students teamwork. Mr. Range assists Mr. Rodden in teaching applicable mathematics skills. Mr. Hovis and Mrs. Watkins teach applied Communications, where students must learn basic communication skills necessary to find and keep a job upon graduation from high school. These skills include resume writing, job seeking skills, the application process, and interviewing skills.

D. The methods used have been very successful every year the program has enjoyed increased enrollment this year it is ranked as one of the highest enrolled class in the ATS. The program has also had one of the highest positive placements; and its method of instruction change every year with out becoming stagnant.

CRITERION 8 **<u>Facilities, Equipment, and Materials Analysis</u>**

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A. The classroom is satisfactory for the learning environment; the lab is well suited for the learning process. The equipment is differing in age, model and technique allowing the student to use a wider variety of machines.

B. All equipment in shop is used in the competency list. All students are given the opportunity to use all equipment based the competency list. In the second year the students can work closer with the higher-tech. units that are in this program: Tig, pipe threaded, and plasma cutter.

C.Videos, textbooks, vertical mills, engine lathes, multi process welders, Tig welders, Mig welders, sheet metal shears, horizontal band saw, and plasma cutter, slip roller hydraulic brake, hydraulic shear, drill press, cnc plasma cutter, and various other equipment is employed in this shop. The textbooks used in the Metal Fabrication classes are very good at supplying a wide variety of informations to the student. The age of the mills is approximately eight and a half years they are used heavily but are in good working order and still work very well. The Engine Lathes are very heavy-duty units, a total of three are used in the lab. Two of the four lathes are ten years old and two are eight years of age. The lab is equipped with four Lincoln Square Wave Technology GTAW units are eight years old and all are in very good condition.

The lab also has five Miller Pipe Pro Plus multi process welders; these units are one year of age and receive moderate to heavy usage, and work very well. The addition of a four foot hydraulic brake is a welcome sight. This unit helps the student shape metal accurately consistent with industry standards. This unit is approx two years of age, and will serve the students for many years to come. The shop also has a six foot hydraulic shear, that allows the cutting of quarter inch material,

D. Enrollment has been very positive and has moved to full. This shows a definite need for a skilled worker that can complete course objectives. Short-term list of equipment needs are: press brake. Long term needs: water jet cutter, CNC machine, and a portable welding trailer.

CRITERION 9 **Enrollment**

[S] A. Total enrollment for the period 2001 – 2003 is as follows:

2000-2001	24
2001-2002	32
2002-2003	36

Maximum capacity in the program is 36 students in two sections of 18 students each.

B. Nonapplicable. This is a secondary program. Dual credit is not offered at this time.

C. Program projections indicate that Metal Fabrication will continue to be filled to capacity. It continues to grow in popularity among area high schools. The college is currently working to articulate the Metal Fabrication program with Welding I and Machine Tool I at the college level, allowing students to earn dual credit.

CRITERION 10 <u>**Cost**</u>

[S]

Year 2002-2003	
Salary	$39,103
Fringe	$ 9,347
Equipment Purchases	$ 7,534
Equipment Maintenance	$0
Supplies	$16,675
Travel	$0
Total Cost	$72,659
Total Enrolled: 36	

Year 2001-2002	
Salary	$37,564
Fringe	$ 8,649
Equipment Purchases	$ 2,856
Equipment Maintenance	$0
Supplies	$12,675
Travel	$0
Total Cost	$61,744
Total Enrolled: 34	

Year 2000-2001	
Salary	$37,564
Fringe	$ 8,304
Equipment Purchases	$ 5,000
Equipment Maintenance	$0
Supplies	$12,675
Travel	$0
Total Cost	$63,543
Total Enrolled: 24	

Total Cost/Revenue			
Year	Cost	Revenue	Revenue Source
2002-2003	$72,659	$102,734	Tuition, Enhancement Grants, Perkins Funds, and State Salary Reimbursements
2001-2002	$61,744	$73,623	
2000-2001	$63,543	$53,200	

TOTAL	$197,946	$229,557	
Average	$65,982	$76,519	

CRITERION 11 **Market Analysis**

[S]

A. The target market for the high school Metal Fabricatioin program are sophomores and juniors in the eleven (11) sending high schools.

B. The Area Technical School uses four means of promoting the Metal Fabrication program:

- Direct mailings to all 9th grade students in Jefferson County and the Kingston K-14 school district in Washington County
- Advertisements in the Jefferson County Journal, a county-wide publication with three newspapers
- Local radio advertisements targeted for students and parents
- Resources of the college Public Relations office

C. Overall enrollment in Area Technical School programs have increased from 56% of capacity to 78% during the period 1998-2003. Metal Fabrication has increased from 64% to 100% of capacity.

D. The Area Technical School conducts a survey through the application process to determine where students learned about the programs available. The results of this data have not been analyzed to determine what the most effective means of marketing might be.

CRITERION 12 **Internal Procedures Analysis**

[S]

A. Advising for all high school students attending the Area Technical School is the primary responsibility of the sending school counselor. The Area Technical School provides written, video and CD-ROM materials to each counselor each year to ensure they are kept current about all program offerings and course pre-requisites. The Jefferson College website is also kept current with this information.

B. The Area Technical School could utilize the services of a Guidance/Placement professional thoroughly familiar with career counseling for vocational technical education students. This individual would work with area employers and education institutions to place students in training related jobs immediately after graduating from high school or direct the student into college level programs related to their high school experiences.

CRITERION 13 **Related Literature**

[S] A. The Area Technical School and the Division Chair of the Trades and Industrial division are working to articulate the Metal Fabrication program with Welding I and Machine Tool I. This will allow the Metal Fabrication program to teach the competencies needed for students to enter into the second year of these programs upon completion of high school.

CRITERION 14 **Placement and Demographics**

[S] A. In the program years2001-2003, the enrollment in the Metal Fabrication program was as follows:

2002-2003	36	100% of capacity
2001-2002	32	89% of capacity
2000-2001	24	66% of capacity

B. For the years 2000-2002, the placement percentage for the Metal Fabrication program was 59%, 100% and 96% respectively. Almost 50% of Area Technical School graduates return to Jefferson College as freshmen enrollees following graduation from high school.

CRITERION 15 **Survey of Previous Program Enrollees**

[S] A. All students, first and second year, were surveyed using the SUMA results (see attached). In addition, program completers were contacted individually 180 days following program completion to ascertain their current employment or education status and solicit their comments regarding the programs.

CRITERION 16 **Admission Requirements**

[S] A. Students enrolling in the Metal Fabrication program are required to be at least sophomores in high school. Admission also strongly suggest the students have a working knowledge of mathematics, including the ability to add, subtract, multiply and divide whole numbers, fractions and decimals. High school coursework in general shop, metals or construction related courses..

CRITERION 17 **<u>Outside Accreditation</u>**

[S] A. Jefferson College's accreditation by North Central Association is the only outside accreditation other that the program has received approval by the Missouri Department of Elementary and Secondary Education for the operation of all programs, including the Metal Fabrication.

CRITERION 18 **<u>Affirmative Action/Sex Equity</u>**

[S] A. Metal Fabrication is open to all high school students, regardless of gender. Metal Fabrication is considered a traditional program for males. There four females enrolled in the program this year.