I. NEW PROGRAM PROPOSAL FORM

Sponsoring Institution: Metropolitan Community College

Program Title: Welding Technology and Management

Degree/Certificate: Associate in Applied Science

Options: NA

Delivery Site(s): Metropolitan Community College District

CIP Classification: 48.0508

Implementation Date: Spring 2011

Cooperative Partners: NA

Expected Date of First Graduation: Spring 2013

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Metropolitan Community College

Program Proposal

for

AAS - Welding Technology and Management

October, 2010

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II. PROGRAM NEED

Student Demand

i. Estimated enrollment each year for the first five years for full-time and part-time students

TABLE 1: STUDENT ENROLLMENT PROJECTIONS

Year	*1*	*2*	*3*	*4*	*5*
Full Time	**8**	**10**	**16**	**20**	**24**
Part Time	**10**	**12**	**16**	**24**	**24**
Total	**18**	**22**	**32**	**44**	**48**

ii. Will enrollment be capped in the future?

Yes, at least in the foreseeable future. The reason for this cap is the limited capacity of the MCC-BTC Welding laboratory facilities, which limits the number of students that can be served during a school year.

A. Market Demand:

i. National, state, regional, or local assessment of labor need for citizens with these skills

This proposal for an Associate in Applied Science (AAS) Degree in Welding Technology and Management is designed to meet and/or exceed the expectations of several entities. An AAS welding program will be implemented using the American Welding Society's curriculum as a guide for instruction. This program will also give graduates of our welding certificate programs the opportunity to further their education and industry knowledge.

The needs of the students will be fulfilled by instructing them to the standards of the American Welding Society's curriculum partnered with actual hands-on training. This will prepare a graduate of our program to be job-ready in the welding/fabrication industry. Two of the top four manufacturing employers in Missouri in 2007 were in the areas of fabricated metal and machinery, so the requirements of a second entity will be satisfied as we provide qualified entry-level welders to fill the employment needs of the welding industry in the greater Kansas City metropolitan area. The prospect of employment is good in this field and the trend is expected to continue, according to the Missouri Occupational Outlook Handbook.

Students completing the two year degree will acquire the skills required of managerial and technical personnel. This will allow interested students to move into other welding-related careers. Currently there are multiple positions on Careerbuilder involving this skill set and they are available in a variety of fields. These fields include welding specialist, outside sales, maintenance, adjunct faculty, automotive repair, and mechanic.

B. Societal Need:

i. General needs which are not directly related to employment

Students completing the welding certificates may return and integrate course work already completed into the two year degree and complete the degree while employed. The anticipated date of implementation is January, 2011. Students who have already completed previous welding courses will be "grandfathered" into the certificate and degree program. Transfer agreements will be secured from institutions granting four-year degrees in related disciplines for those students wishing to continue their formal education.

C. Methodology used to determine "A" and "B" above.

Research was based on standard sources of employment and employment outlook information, including the Bureau of Labor Statistics, MERIC, and Careerbuilder.com.

III. DUPLICATION AND COLLABORATION

Seven similar Welding and Technology AAS programs are available throughout the state of Missouri. These other similar programs are not offered in the greater Kansas City metropolitan area. Our proposed program would be a unique opportunity for students in our region hoping to pursue a career in this field.

Does delivery of the program involve a collaborative effort with any external institution or organization? NO

IV. PROGRAM STRUCTURE

A. Total credits required for graduation: **62 - 67**

B. Residency requirements, if any: **NA**

C. Total credits in General education: **18** (See Table 2, *General Education Requirements*).

TABLE 2: GENERAL EDUCATION REQUIREMENTS

Course Number	Title	Credit Hours
ENGL 101	Composition and Reading I	3
HIST 120 HIST 121 POLS 135 POLS 136 POLS 137	United States History to 1865 *or* United States History since 1865 *or* Introduction to Political Science *or* Introduction to American National Politics *or* Introduction to State and Local Politics	3
MATH 103 MATH 103R MATH 104 MATH 120 MATH 130 MATH 150	Technical Mathematics I *or* Technical Mathematics I w/ Review *and* Technical Mathematics II - *or* - College Algebra *and* Trigonometry *or* Precalculus	6 - 7
SPAN 100	Beginning Occupational Spanish	3
SPDR 100	Fundamentals of Speech	3

Total General Education Credits 18 - 19

D. Total credits in Specific Program Requirements: **41** (See Table 3, *Specific Program Requirements*).

E. Total credits in electives: **3-7** (See Table 4, *Program Electives*).

F. Requirements for thesis, internship or other capstone experience: **Capstone experience is required and is implemented in WELD 290, which is part of the specific program requirements.**

G. Any unique features such as interdepartmental cooperation: **NA**

TABLE 3: SPECIFIC PROGRAM REQUIREMENTS

Course Number	Title	Credit Hours
CSOF 100	Introduction to Personal Computing	1
EHSS 111 EHSS 112	Introduction to Health & Safety for General Industry *or* Introduction to Health & Safety for Construction	1
INTE 124	Employment Strategies for Technical Careers	3
WELD 110	Welding Industry Fundamentals	3
WELD 120	Thermal Cutting Processes Lecture	1
WELD 121	Thermal Cutting Processes Lab	2
WELD 130	Print Reading & Weld Symbols	3
WELD 140	Shielded Metal Arc Welding I (stick) Lecture	1
WELD 141	Shielded Metal Arc Welding I (stick) Lab	2
WELD 150	Gas Metal Arc Welding I (MIG) Lecture	1
WELD 151	Gas Metal Arc Welding I (MIG) Lab	2
WELD 160	Gas Tungsten Arc Welding I (TIG) Lecture	1
WELD 161	Gas Tungsten Arc Welding I (TIG) Lab	2
WELD 230	Layout and Fabrication Lecture	1
WELD 231	Layout and Fabrication Lab	2
WELD 240	Shielded Metal Arc Welding II (stick) Lecture	1
WELD 241	Shielded Metal Arc Welding II (stick) Lab	2
WELD 250	Gas Metal Arc Welding II (MIG) Lecture	1
WELD 251	Gas Metal Arc Welding II (MIG) Lab	2
WELD 260	Gas Tungsten Arc Welding II (TIG) Lecture	1
WELD 261	Gas Tungsten Arc Welding II (TIG) Lab	2
WELD 270	Flux Core Arc Welding Lecture	1
WELD 271	Flux Core Arc Welding Lab	2
WELD 290	Management Skills for the Trades	3

Total Specific Program Requirements 41

TABLE 4: PROGRAM ELECTIVES

Course Number	Title	Credit Hours
BSAD 105 BSAD 109 BSAD 120	Human Resources Management *or* Principles of Supervision *or* Organizational Behavior	3
ETEC 152 ETEC 169	Engineering Graphics and CADD I *or* CADD I	3-5
MATE 100 MATE 101 MATE 130	Introduction to Manufacturing Technology & Related Industry Machining and Tooling I Machining for Related Occupations	3

Total Electives 3 - 7

VI. PROGRAM CHARACTERISTICS AND PERFORMANCE GOALS

Institution Name: Metropolitan Community College

Program: Name: Associate in Applied Science – Welding Technology and Management

Date: July 19, 2010

(Although all of the following guidelines may not be applicable to the proposed program, please carefully consider the elements in each area and respond as completely as possible in the format below. Quantification of performance goals should be included wherever possible.)

Student Preparation

- Any special admissions procedures or student qualifications required for this program which exceed regular university admissions, standards, e.g., ACT score, completion of core curriculum, portfolio, personal interview, etc. Please note if no special preparation will be required.

  No special preparation will be required.

- Characteristics of a specific population to be served, if applicable.

  This program will serve both traditional and non-traditional aged students.

Faculty Characteristics

- Any special requirements (degree status, training, etc.) for assignment of teaching for this degree/certificate.

  A minimum of Master's degree will be required to teach in the discipline, along with current American Welding Society (AWS) certification as a Certified Welding Inspector (CWI), and a minimum of 5 years full-time experience in the welding industry.

- Estimated percentage of credit hours that will be assigned to full time faculty. Please use the term "full time faculty" (and not FTE) in your descriptions here.

  55 percent of credit hours will be assigned to full-time faculty, and 45 percent to part-time.

- Expectations for professional activities, special student contact, teaching/learning innovation.

  Full-time faculty are expected to maintain a minimum of five weekly office hours to facilitate student contact; maintain an up-to-date professional development plan; stay current in their industry (including maintaining professional certification,

including CWI status); and maintain teaching/learning strength by attending seminars, self-study, or other appropriate methods.

Enrollment Projections: These data are projected in Table 1 on Page 2.

Student and Program Outcomes

- Number of graduates per annum at three and five years after implementation.
- Special skills specific to the program.

  The AAS program provides technical instruction in the science of welding technologies, including a background of the industry, print reading, thermal cutting, current welding practices and related technologies, as well as soft skills and management fundamentals.

Welding Industry Career Paths: Program Philosophy

The AAS in Welding Technology and Management meets the needs of students and industry by focusing not only on specific technical skills, but also on the lifelong career path of the student. The program uses the American Welding Society's (AWS) curriculum as a guide for topical instruction.

By utilizing the AWS curriculum, the program prepares students with current, up-to-date skill sets needed in industry. This serves industry by providing a pool of qualified job applicants, and at the same time helps students gain initial employment in the field. It should be noted that welding is one of the high-demand occupations designated by the state of Missouri.

Students taught using the new curriculum will be prepared to successfully pass the AWS written certification tests, which are approved by the Missouri Department of Education as valid technical skill assessments (TSAs).

The AAS program prepares students beyond the acquisition of technical skills. Integrated into the curriculum is a course in employment strategies (*INTE 124*), which helps students develop the soft skills necessary to compete in today's job market. The general education component encompasses important social, economic, and communication skills; these skills are reinforced in the technical courses through an overlapping set of course outcomes.

It is anticipated that students who complete the AAS program will eventually want to move up the ladder to management and leadership positions within an organization. Therefore, the AAS program also includes skills required of managerial and technical training personnel. These skills are incorporated into *WELD 290, Management Skills for the Trades*, as well as within several Business Administration (BSAD) electives.

This design brings added value to the AAS that will allow students to transcend the welding industry into welding-related careers when these opportunities are present, fulfilling the personal desires of promotion throughout their careers.

Program Outcomes

Welding professionals work in a wide variety of environments, from factory production to complex civil projects. They work closely with other welders, as well as with technologists, engineers, and non-professionals in organizations. The skill set required to be successful in the welding industry includes both technical ability (the person can weld successfully, meaning that they can generate work that is code compliant), as well as soft skills (critical thinking, communication, planning, and management of people and projects.) The outcomes of this program reflect these needs.

- Proportion of students who will achieve licensing, certification, or registration: **75%**

Vocational program – authentic assessments that are program specific:

Both written and hands-on workmanship assessments from the AWS SENSE Entry Level Program will be used to assess students' level of proficiency. Although not a requirement for graduation, it is expected that students will become certified with the AWS SENSE Entry Level Program in one or more AWS specialties:

- Shielded Metal Arc Welding
- Gas Metal Arc Welding
- Flux Core Arc Welding
- Gas Tungsten Arc Welding

Placement rates in related fields, in other fields, unemployed:

The data set on employment of MCC certificate graduates is too small to give any reliable indication of what AAS employment placement will be like. The following rates are anticipated for the AAS completers, based on anecdotal placement data from Lex La Ray Technical Center (Lexington, MO) from 2000 to 2009:

Type of Placement (Work Environment)	Fabrication / Job Shop	Construction / Union Work	Military	Unemployed or Unrelated Job
Fraction of Graduates	40%	40%	10%	10%

Transfer rates, continuous study:

It is anticipated that 30 percent of the program's graduates will seek additional education.

Program Accreditation:

The program is an institutional member of the American Welding Society and is accredited as an AWS SENSE Training and Testing Site.

VII. INSTITUTIONAL CHARACTERISTICS

Metropolitan Community College – Business & Technology Campus

The Business & Technology Campus (BTC) is home to many of MCC's career and technical programs. These programs include Manufacturing Technology, Engineering Technology & CADD, Cisco, Heating Ventilation & Air Conditioning, Industrial Technologies, Environmental Health & Safety, and Welding. Dedicated laboratory facilities exist for each program, and the total classroom and laboratory space in the facility is approximately 200,000 square feet. Each program has at least one full time faculty assigned to it.

The campus supports an average of 900 students per semester combined across these credit programs. In addition, in conjunction with the MCC Institute for Workforce Innovation (IWI), BTC supports non-credit community-based programming through Continuing Professional Education (CPE), and focused industrial training through Business & Learning Solutions (BLS). BLS clients include Harley Davidson, General Motors, and many other Kansas City based manufacturing operations.

The BTC welding department is coordinated by Dr. Tim Gill, a full-time MCC faculty member with more than 20 years of teaching experience. Tim Gill holds a Doctorate in Curriculum and Instruction, a Masters in Technical Education, and AWS Certified Welding Inspector (CWI) and Certified Welding Educator (CWE) credentials. A full-time laboratory specialist is also employed by the welding department.

The welding department is equipped with 24 individual welding booths, each with a complete complement of welding equipment to train students in arc, TIG, MIG, and related welding and cutting technologies. The department also houses a dedicated grinding and milling area, as well as machine tools for forming and cutting raw materials.

WELD - MIG Job Ready Certificate (AWS modular certification)

SPECIFIC PROGRAM REQUIREMENTS

MATH 103R	Technical Math I w/ review *or* higher	3 - 4
WELD 110	Welding Industry Fundamentals	3
WELD 120	Thermal Cutting Processes Lecture	1
WELD 121	Thermal Cutting Processes Lab	2
WELD 130	Print Reading & Weld Symbols	3
WELD 150	Gas Metal Arc Welding I (MIG) Lecture	1
WELD 151	Gas Metal Arc Welding I (MIG) Lab	2
WELD 230	Layout and Fabrication Lecture	1
WELD 231	Layout and Fabrication Lab	2
WELD 270	Flux Core Arc Welding Lecture	1
WELD 271	Flux Core Arc Welding Lab	2
	TOTAL CREDIT HOURS	21 -22

WELD - MIG/TIG Job Ready Certificate (AWS modular certification)

SPECIFIC PROGRAM REQUIREMENTS

MATH 103R	Technical Math I w/ Review *or* higher	3 - 4
WELD 110	Welding Industry Fundamentals	3
WELD 120	Thermal Cutting Process Lecture	1
WELD 121	Thermal Cutting Process Lab	2
WELD 130	Print Reading & Weld Symbols	3
WELD	Gas Metal Arc Welding I (MIG) Lecture	1

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WELD 151	Gas Metal Arc Welding I (MIG) Lab	2
WELD 160	Gas Tungsten Arc Welding I (TIG) Lecture	1
WELD 161	Gas Tungsten Arc Welding I (TIG) Lab	2
WELD 230	Layout and Fabrication Lecture	1
WELD 231	Layout and Fabrication Lab	2
	TOTAL CREDIT HOURS	21-22