

Board of Trustees Agenda Item

Board Meeting Date: March 5, 2012

Title of Item: Approval of the Associate in Science Degree, Sheet Metal Building Trades Apprenticeship

Background and Analysis:

Foothill seeks board approval for application to the State Chancellor's Office for the associate degree in Sheet Metal Building Trades Apprenticeship.

The Sheet Metal Building Trades Associate of Science Degree consists of a comprehensive course of study necessary for career success as a sheet metal worker. This program is designed to meet the “whole program status” as designed by the Division of Apprenticeship Standards (DAS). Graduates of the program will have acquired the knowledge and skills needed to function as a tradesperson in the foundation sciences, mathematics, safety, review, code reading and all the necessary job skills. Upon completion of required class hours and work experience, graduates will be qualified as journeypersons in the Sheet Metal Building Trades. Students receive a certificate from 1) The Division of Apprenticeship Standards, and 2) Foothill College.

The new degree has been approved by Foothill's curriculum committee and Academic Senate.

Recommendation: (specify if information only)

Foothill administration recommends approval of the Sheet Metal Building Trades Apprenticeship degree program

Submitted by:	Judy Miner
Additional contact names:	John Mummert, Kimberlee Messina, Carolyn Holcroft
Is backup provided?	Yes.

Foothill College
CCC-501: New Credit Program
Associate in Science Sheet Metal Building Trades Apprenticeship

Criteria A: Appropriate to Mission

1. Statement of Program Goals and Objectives

The Sheet Metal Building Trades Associate of Science Degree consists of a comprehensive course of study necessary for career success as a sheet metal worker. This program is designed to meet the “whole program status” as designed by the Division of Apprenticeship Standards (DAS). Graduates of the program will have acquired the knowledge and skills needed to function as a tradesperson in the foundation sciences, mathematics, safety, review, code reading and all the necessary job skills. Upon completion of required class hours and work experience, graduates will be qualified as journeypersons in the Sheet Metal Building Trades. Students receive a certificate from 1) The Division of Apprenticeship Standards, and 2) Foothill College.

The preparation and training students receive from this program is critical for upward mobility, career enhancement, promotional opportunities and marketable skills. Training in the latest technologies within the sheet metal field will allow both entry-level and advanced laborers to gain currency in knowledge, skills and abilities as employees of the union.

Career opportunities for qualified persons entering the sheet metal trades are very diverse. Depending on the student's career interest and courses taken, graduates find employment as Sheet Metal Worker, Foreman, Superintendent, Sheet Metal Fabricator, Estimator/Detailer, Sheet Metal Project Manager, Contractor/Employer, Sheet Metal Service Worker, Instructor, Sheet Metal Ship Yard Worker, Building Inspector and other occupations.

2. Catalog Description

The Sheet Metal trade is unique because it is one of the few crafts that starts with raw material, creates a component, installs and maintains the product. Using a combination of mathematics, layout tools, hammers, drills, hacksaws, plasma and laser beam cutting systems, computers, cutting, forming, seaming or welding machines, workers manipulate the material into the product desired. The maintenance sector includes preventive maintenance, repair, testing, balancing and certification of the installed systems. Items commonly fabricated and installed include HVAC systems, metal roofs, kitchen hoods, various flashings, gutters, decorative architectural features and many other items made of a variety of metals. It is an interesting and evolving field with exciting growth potential. The apprenticeship is an earn-while-you-learn program involving paid “full time” work and related classes.

3. Program Requirements

Associate Degree Requirements:

- English proficiency: ENGL 1A, 1AH, ESLL 26 or equivalent.
- Mathematics proficiency: MATH 105, 108, 17 or equivalent.

A minimum of 90 units is required* to include:

- All Foothill General Education requirements (30-35 Units)
- Core courses (40.5 Units)
- Support courses (15 Units)

*Additional elective course work may be necessary to meet the 90-unit minimum requirement for the associate degree.

Core Courses (40.5 Units)

APSM 101	SMQ-1 Trade Introduction (1.5 Units)
APSM 102	SMQ-2 Certified Safety & Beginning Trade Math (1.5 Units)
APSM 103	SMQ-3 Sheet Metal Tools & Shop (1.5 Units)
APSM 104	SMQ-4 Soldering & Common Seams (1.5 Units)
APSM 105	SMQ-5 Drafting Introduction & Views (1.5 Units)

APSM 106	SMQ-6 Beginning Duct Fittings (1.5 Units)
APSM 107	SMQ-7 Parallel Line Fittings (1.5 Units)
APSM 108	SMQ-8 Triangulation Fittings (1.5 Units)
APSM 109	SMQ-9 Radial Line Layout Ogee Offsets (1.5 Units)
APSM 110	SMQ-10 Basics of Architectural Sheet Metal (1.5 Units)
APSM 111	SMQ-11 Architectural Sheet Metal (1.5 Units)
APSM 112	SMQ-12 Field Installation (1.5 Units)
APSM 113	SMQ-13 Welding 1: Process & Safety Overview (1.5 Units)
APSM 114	SMQ-14 Welding 2: GMAW (1.5 Units)
APSM 115	SMQ-15 Welding 3: GMAW (1.5 Units)
APSM 116	SMQ-16 Plans & Specifications (1.5 Units)
APSM 117	SMQ-17 Submittals & Shop Drawings (1.5 Units)
APSM 118	SMQ-18 Industrial & Stainless Steel Introduction (1.5 Units)
APSM 119	SMQ-19 HVAC Air Systems & Duct Design (1.5 Units)
APSM 120	SMQ-20 Measuring & Sketching (1.5 Units)
APSM 121	SMQ-21 Fabrication & Shortcuts (1.5 Units)
APSM 122	SMQ-22 Codes & Standards (1.5 Units)
APSM 123	SMQ-23 Residential Sheet Metal (1.5 Units)
APSM 124	SMQ-24 Metal Roofing (1.5 Units)
APSM 125	SMQ-25 Detailing (1.5 Units)
APSM 126	SMQ-26 Foreman Training (1.5 Units)
APSM 127	SMQ-27 Basic AutoCAD (1.5 Units)

Support Courses (any 15 units of the following):

APSM 128	SMQ-28 HVAC Energy Conservation & Environmental Tech (1.5 Units)
APSM 130	SMQ-30 Advanced Welding (1.5 Units)
APSM 131	SMQ-31 CAD Detailing (Beginning CAD Duct) (1.5 Units)
APSM 132	SMQ-32 Intermediate CAD Detailing (1.5 Units)
APSM 133	SMQ-33 Advanced Architectural (1.5 Units)
APSM 134	SMQ-34 Advanced Layout Fabrication (1.5 Units)
APSM 135	SMQ-35 Project Management, Takeoffs & Estimates (1.5 Units)
APSM 136	SMQ-36 Service Basics (1.5 Units)
APSM 137	SMQ-37 Final HVAC Project (1.5 Units)
APSM 138	SMQ-38 Final Architectural, Industrial, Ornamental Project (1.5 Units)
CWE 65A*	Occupational Work Experience: Apprentice-Sheet Metal (4.0 Units)

General Education (30-35 Units)

See Attachment A: Foothill General Education Requirements

*Note: Can take CWE 65A for up to 8 units towards the AS degree.

4. Background and Rationale

Training in the Sheet Metal Trades has historically been offered as a registered apprenticeship program in conjunction with the Bay Area Sheet Metal Training Center, Division of Apprenticeship Standards (DAS), the Local Education Agency (LEA) and the Chancellor's Office. Foothill is responding to the training needs for Building Trades Sheet Metal Workers. This proposed program is designed to meet the needs of apprentice and journey person sheet metal workers' who are entering a career in the construction trades.

This program fits within Foothill's Educational Master Plan and is completely compatible with its stated mission to support Workforce Education and Development. Appointed Faculty and Administrators from the Sheet Metal Training Center who meet minimum apprenticeship instructor qualifications are designated to teach Sheet Metal courses prescribed in this document.

Criteria B: Need

5. Enrollment and Completer Projections

Each course has 15-20 students per course. The number of projected completers per year is 90-100 graduates. These figures are based on the number of graduates between the years 2006 through 2011. The economy and job availability has a direct affect on enrollment. Current employment and projections for 2012 show that job opportunities are improving in Apprenticeship "green" trades. In 2008-09, there were approximately 700-800 apprentices in the Bay Area Local 104 Sheet Metal Building Trades program. The demand for Sheet Metal workers is strong and the future is healthy. This is attributed to the mandate for new and existing building retro-fits to meet today's "energy efficiency" demands.

6. Place of Program in Curriculum/Similar Programs

Currently, Foothill College awards a Sheet Metal Building Trades Certificate of Achievement and several specialized certificates. Adding an Associate in Science degree option to the existing program will give the students a fully rounded educational experience by completing general education courses as well as specialized apprenticeship skills.

7. Similar Programs at Other Colleges in Service Area

There are no similar programs in our immediate service area. There are courses offered at two other community colleges within a 55 mile radius: Laney College in Oakland, which covers a small portion of the curriculum called, "Heating Ventilation and Air Conditioning (HVAC) for Environmental Controls", and San Jose City College's program called, "HVAC and Facilities Maintenance". These programs do not offer the same level of certification and licensure within the trades that Foothill's program offers.

8. Labor Market Information & Analysis (CTE only)

The Sheet Metal Building Trades Associate of Science degree will increase opportunities and interest for current and prospective college students. This will increase promotional and job opportunities in the "green" careers. Occupational profiles were obtained from the various counties of Northern CA, which offer Sheet Metal building trade training and certification. See Attachment A for labor market information.

9. Employer Survey (CTE only)

This program was developed following the curriculum guidelines of the DAS and combined with established program standards for the Sheet Metal apprenticeship program. No survey was conducted, but the program's advisory board reviews all aspects of the program and votes each month on program changes.

10. Explanation of Employer Relationship (CTE only)

The Bay Area Sheet Metal program is co-sponsored by both the signatory employers and Sheet Metal Workers Local 104. The employment of apprentices is arranged in accordance with the collective bargaining agreement between labor and management.

11. List of Members of Advisory Committee (CTE only)

Jim Hussey, Chief Operations Officer, Bay Area Sheet Metal Local 104 JATC
Javier Campos, Training Director, Bay Area Sheet Metal Local 104 JATC
Frank Cuneo, Training Coordinator, Bay Area Sheet Metal Local 104 JATC
Chris Valverde, Training Coordinator, Bay Area Sheet Metal Local 104 JATC
John Mummert, Interim Vice President, Workforce Development & Instruction, Foothill College
Verley O'Neal, Faculty Division Curriculum Representative, Foothill College
David Ellis, Senior Program Coordinator, Foothill College
Steve Lopez, Manager, Contractor Representative, Critchfield Mechanical, Inc.

12. Recommendations of Advisory Committee (CTE only)

The Advisory Committee last met regarding this topic on February 15, 2011 at the Santa Clara County Sheet Metal Training Center with representatives from Bay Area Sheet Metal Local 104. The advisory committee came to the unanimous conclusion that an Associate of Science Degree will soon become a prerequisite for promotional opportunities, career advancement and teaching opportunities. See Attachment B for Meeting Minutes.

Criteria C: Curriculum Standards

13. Display of Proposed Sequence

Apprenticeship students are required under Section 3074 of the Labor Code to work in their respective fields. This affects the number of courses they can take each quarter while in the Apprenticeship program.

FIRST YEAR

Fall

APSM 101	SMQ-1 Trade Introduction (1.5 Units)
CWE 65A	Occupational Work Experience: Apprentice-Sheet Metal (4.0 Units)
APSM 102	SMQ-2 Certified Safety and Beginning Trade Math (1.5 Units)

Winter

APSM 103	SMQ-3 Sheet Metal Tool and Shop (1.5 Units)
CWE 65A	Occupational Work Experience: Apprentice-Sheet Metal (4.0 Units)
APSM 104	SMQ-4 Soldering and Common Seams (1.5 Units)

Spring

APSM 105	SMQ-5 Drafting Introduction and Views (1.5 Units)
APSM 106	SMQ-6 Beginning Duct Fittings (1.5 Units)
GE Course	General Education (3.0 Units)

SECOND YEAR

Fall

APSM 107	SMQ-7 Parallel Line Fittings (1.5 Units)
APSM 108	SMQ-8 Triangulation Fittings (1.5 Units)
GE Course	General Education (4.0 Units)

Winter

APSM 109	SMQ-9 Radial Line Layout and Ogee Offsets (1.5 Units)
APSM 110	SMQ-10 Basics of Architectural Sheet Metal (1.5 Units)
GE Course	General Education (5.0 Units)

Spring

APSM 111	SMQ-11 Architectural Sheet Metal (1.5 Units)
APSM 112	SMQ-12 Field Installation (1.5 Units)
GE Course	Course General Education (3.0 Units)

THIRD YEAR

Fall

APSM 113	SMQ-13 Welding 1: Process and Safety Overview (1.5 Units)
APSM 114	SMQ-14 Welding 2: GMAW (1.5 Units)
GE Course	General Education (4.0 Units)

Winter

APSM 115	SMQ-15 Welding 3: SMAW (1.5 Units)
APSM 116	SMQ-16 Plans and Specifications (1.5 Units)
GE Course	General Education (5.0 Units)

Spring

APSM 117	SMQ-17 Submittals and Shop Drawings (1.5 Units)
APSM 118	SMQ-18 Industrial and Stainless Steel Introduction (1.5 Units)
GE Course	General Education (3.0 Units)

FOURTH YEAR

Fall

APSM 119	SMQ-19 HVAC Air Systems and Duct Design (1.5 Units)
APSM 120	SMQ-20 Measuring and Sketching (1.5 Units)
GE Course	General Education (3.0 Units)

Winter

APSM 121	SMQ-21 Fabrication and Shortcuts (1.5 Units)
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APSM 122	SMQ-22 Codes and Standards (1.5 Units)
GE Course	General Education (4.0 Units)
<u>Spring</u>	
APSM 123	SMQ-23 Residential HVAC (1.5 Units)
APSM 124	SMQ-24 Metal Roofing (1.5 Units)
Support	Support Course (1.5 Units)

FIFTH YEAR

Fall

APSM 125	SMQ-25 Detailing Introduction (1.5 Units)
APSM 126	SMQ-26 Foreman Training (1.5 Units)

Winter

APSM 127	SMQ-27 Basic AutoCAD (1.5 Units)
Support	Support Course (1.5 Units)
Support	Support Course (1.5 Units)

Spring

Support	Support Course (1.5 Units)
Support	Support Course (1.5 Units)

14. Transfer Applicability

This program is not transferable.

Criteria D: Adequate Resources

15. Library and/or Learning Resource Plan

No additional resources will be required beyond the college's current resources.

16. Facilities and Equipment Plan

No additional resources will be required beyond the college's current resources.

17. Financial Support Plan

This program will be funded under the rules and guidelines of Montoya Funds per the Budget Act. Montoya funds are given per clock hour of related and supplemental instruction. No additional impact is projected.

18. Faculty Qualifications and Availability

Faculty in the Sheet Metal Apprenticeship program are qualified as instructors under the guidelines of Title 5, Section 53413, Minimum Qualifications for Apprenticeship Instructors. The General Education courses offered in this program will be adequately staffed and managed by Foothill faculty in accordance with state minimum qualification standards. All faculty that will teach in this program meet the State minimum qualifications.

Criteria E: Compliance

19. Model Curriculum (if applicable)

Sheet Metal curriculum is based on modeled curriculum from the Sheet Metal International Training Institute and the Bay Areas Sheet Metal JATC. Sheet Metal Air Conditioning National Association (SMACNA) supplies documentation of industry standards. Sheet Metal Occupational Health Institute Trust (SMOHIT) provides industry Safety and Health curriculum. The majority of the industry curriculum is derived from the International Training Institute for the Sheet Metal and Air Conditioning industry. Other curriculum sources such as the California Green Building Code are used as well.

20. Licensing or Accreditation Standards

There is no licensure or accrediting body for this Building Trades Sheet Metal program. Completion of the program courses demonstrates that the student has reached a level of mastery in their classroom training and on-the-job training (OJT) hours in a multi-year and multi-tiered apprenticeship program.

21. Student Selection and Fees

Student selection is based on meeting minimum qualifications, passing an exam/assessment test and completing an oral interview. Student's participation in the Apprenticeship courses are paid through Montoya Funds. All General Education course fees are to be paid for by the student through the normal student fees.