

MONTANA BOARD OF REGENTS

LEVEL II REQUEST FORM

Item No.:	138-2703-R0108	Date of Meeting:	January 10, 2008
Institution:	Montana State University Billings COT		
Program Title:	Associate of Applied Science Construction-Carpentry		

Level II proposals require approval by the Board of Regents.

Level II action requested (check all that apply): Level II proposals entail substantive additions to, alterations in, or termination of programs, structures, or administrative or academic entities typically characterized by the (a) addition, reassignment, or elimination of personnel, facilities, or courses of instruction; (b) rearrangement of budgets, cost centers, funding sources; and (c) changes which by implication could impact other campuses within the Montana University System and community colleges. Board policy 303.1 indicates the curricular proposals in this category:

- 1. Change names of degrees (e.g. from B.A. to B.F.A.)
- 2. Implement a new minor or certificate where there is no major or no option in a major;
- 3. Establish new degrees and add majors to existing degrees;
- 4. Expand/extend approved mission; and
- 5. Any other changes in governance and organization as described in Board of Regents' Policy 218, such as formation, elimination or consolidation of a college, division, school, department, institute, bureau, center, station, laboratory, or similar unit.

Specify Request:

Montana State University Billings College of Technology seeks Level II approval from the Montana Board of Regents to offer an Associate of Applied Science in Construction-Carpentry. The AAS in Construction-Carpentry was granted temporary Level I approval status by the Board of Regents in November 2005.

Montana State University-Billings College of Technology
Associate of Applied Science Construction-Carpentry

Curriculum Proposal

1. Overview

The field of construction-carpentry offers high-wage and interesting careers within the architecture and construction career pathway. Construction-carpentry has been identified as an area of critical need of entry-level employees. Construction-carpenters are identified locally, statewide, and nationally as being in short supply now and with increasing demand anticipated.

Construction-carpentry has been one of Montana's fastest growing industries, consistently outpacing the state's overall employment growth. The development of a construction technology-carpentry program will provide significant opportunities for MSU Billings COT to meet critical local and regional workforce training needs.

Montana State University Billings College of Technology (MSU-B COT) Construction Technology-Carpentry program will add a technical, two-year degree to its existing programs in response to the need to develop educational pathways for Montana's high-demand careers in architecture and construction. This program will provide the opportunity for individuals with no training or for incumbent workers to obtain highly technical education and skills training. Upon successful completion of this program, students will have earned an Associate of Applied Science degree in Construction Technology-Carpentry.

The degree program and plan of study were developed by members of the College of Technology Construction Technology-Carpentry Program Development Committee, through research of current successful programs, standards established by the National Center for Construction Education and Research (NCCER), and by obtaining, local and regional industry input from residential, commercial, and local and regional construction organizations such as the Montana Contractor's Association and the Billings Homebuilder's Association.

2. Need

- a. To what specific need is the institution responding in developing the proposed program?

MSU-B COT intends to provide a public, two-year associate of applied science degree in Construction Technology-Carpentry to meet the existing and growing education needs of this industry segment. Due to the large, and increasing, number of residential and commercial building projects in our city, this program is expected to prepare entry-level construction carpenters for Billings, the region and the state. Creation of this program was first considered in response to a request from members of the Billings residential and commercial construction industry to study the feasibility and need for this program.

Montana continues to face a significant workforce shortage crisis. Between 2001 and 2005, construction was the third fastest growing industry in Yellowstone County with a growth of over 1,045 new construction jobs (Swanson, 2007). Between 2000 and 2007, the labor force in Yellowstone County grew by 8,399 increasing demand for new home and commercial construction in the region (Swanson, 2007).

The Construction Technology-Carpentry Program will provide students with an opportunity to engage in both classroom work as well as application-based, hands-on learning. The program will be developed in accordance with the National Center for Construction and Education Research (NCCER) nationally accredited standards. This effort was coordinated with the Montana Contractor's Association, Billings Homebuilder's Association, and local and regional industry. In addition, the MSU-Billings COT worked with the UM-Missoula COT and MSU-Northern to develop a standardized NCCER-based Construction-carpentry program that is accredited by NCCER and is fully articulated.

The Associate of Applied Science Degree in Construction Technology-Carpentry will provide accessible, affordable, efficient, and practical learning opportunities for individuals in Billings and Montana. Given the current economic climate, this program has potential for improving the wage-earning potential of the industry's future workers, the local economy, and personal/professional growth in an educationally sound manner.

The Construction Technology-Carpentry Program AAS degree will support the significant workforce training needs of Montana which comprises 6.3% of the entire labor workforce (Montana Bureau of Labor and Statistics, "Montana Economy at a Glance," 2005). Most of the skilled, blue-collar workers important to the construction industry fall in the category of "precision production, craft, and repair occupations" in the Census Bureau's occupational classification system. According to the "Montana Economy at a Glance" report, 12 percent of Montana's civilian labor force had an occupation in this category, compared with 11 percent nationally. Local industry concern has been expressed about an impending shortage of these skilled workers.

According to Montana Department of Labor occupational forecasts between 2004 and 2014, Montana is projected to need 3,327 carpenters with projected annual openings totaling 507 and an annual mean salary of \$32,938 reported from 2004 (Montana Bureau of Labor and Statistics, <http://www.ourfactsyourfuture.org/cgi/databrowsing/?PAGEID=4>).

In a presentation to the Montana Workforce Conference held in Great Falls, Montana, on June 22, 2005, Bryon Roberts, Executive Director of the Montana Building Industry in Helena, Montana noted that "the construction industry in Montana is larger than mining, larger than timber and larger than the entire manufacturing center," with an increase of 2,800 net jobs in 2004. Jessica Counts in Montana Economy at a Glance (2007) reports Montana's economy is changing with over 1,100 new private businesses added in the State between 2005 and 2006. Counts reports specialty trade contracts as the second fastest expanding sector of Montana's economy and construction of buildings as the third fastest expanding sector (http://www.ourfactsyourfuture.org/admin/uploadedPublications/2033_July07_EAG_Article.pdf).

On June 22, 2005, there were approximately 400 job openings in the construction trades in Montana which represents 12% of the 3,400 open jobs posted on the www.jobs.mt.gov website. A well-trained workforce is critical for Montana business and industries to meet their production schedules. In particular, the Montana construction industry has felt the impact of the lack of trained workers in the construction industry and particularly in carpentry. Residential and commercial projects fall behind schedule resulting in a negative economic impact."

According to a report developed by Dr. Paul Pozin of the Bureau of Business and Economic Research at the University of Montana and presented to the Montana Board of Regents on September 22, 2005, 21.6% of all businesses surveyed in Montana stated they had a shortage with construction and healthcare topping the list. The construction industry in Montana represents 5.8% of Montana's Gross State Product and the industry's contribution to the economy exceeded 1.48 billion dollars in 2003. In Yellowstone County alone, there were over 1,029 permits for single-family, multi-family and modular housing units issued in 2004.

The U.S. Department of Labor reports 3,680 Montana employees in the construction field, not counting those that are self-employed. Based on the median income of this population this represents over \$123 million in local wages. Pairing this with non-employers in the construction field (self-employed) which included an additional 1,274 workers, and an

additional \$63 million in wages, there is an industry total of close to 5,000 workers generating \$186 million in wages in the local Yellowstone County area.

- b. How will students and any other affected constituencies be served by the proposed program?

Graduates from the Construction Technology-Carpentry program are eligible for certification with the National Center for Construction Education and Research (NCCER). Graduates will fill a growing need in construction technology-carpentry, now and in the future.

The Job

Carpenters are involved in many different kinds of construction activity, from the building of highways and bridges, to the installation of kitchen cabinets. Carpenters construct, erect, install, and repair structures and fixtures made from wood and other materials. Depending on the type of work and the employer, carpenters may specialize in one or two activities or may be required to know how to perform many different tasks. Small home builders and remodeling companies may require carpenters to learn about all aspects of building a house—framing walls and partitions, putting in doors and windows, building stairs, installing cabinets and molding, and many other tasks. Large construction contractors or specialty contractors, however, may require their carpenters to perform only a few regular tasks, such as framing walls, constructing wooden forms for pouring concrete, or erecting scaffolding. Carpenters also build tunnel bracing, or brattices, in underground passageways and mines to control the circulation of air through the passageways and to worksites.

According to Larry Swanson, economist from the O’Conner Center for the Rocky Mountain West, Yellowstone County is expected to see significant decrease in the number of individuals between the ages of 18-49 over the next decade. This will lead to increased pressure on an already tight labor market which demonstrated unemployment rates below 2% in August, 2007 (Swanson, 2007).

In May 2004, median hourly earnings of carpenters were \$16.78. The middle 50 percent earned between \$12.91 and \$22.62. The lowest 10 percent earned less than \$10.36, and the highest 10 percent earned more than \$28.65. (U.S. Bureau of Labor and Statistics. Extracted from <http://www.bls.gov/oco/ocos202.htm> on September 12, 2007.)

- c. What is the anticipated demand for the program? How was this determined?

The shortage of qualified construction carpenters creates a regional need to offer this program. The Montana Bureau of Labor and Statistics reports an average of 507 carpentry job openings per year through 2014. We fully anticipate full enrollment beginning with the first year of course offerings.

2006-2007:	18 Students enrolled
2007-2008:	27 Students enrolled
2008-2009:	32 Students projected
2009-2010:	40 Students projected
2010-2011	40 Students projected

With 20-25 graduates per year.

** It is important to note that many additional students will be trained via partnerships with local construction companies who may wish to enroll and pay for employees to enroll in the

construction core classes. Those students will be encouraged to enroll for credit so they can be advised to pursue the AAS degree upon completion of the construction training.

3. Institutional and System Fit

- a. What is the connection between the proposed program and existing programs at the institution?

This program fits the MSU-B COT's mission very well, as it has been developed to enable the College to be responsive to a significant workforce need. In addition, the new program is highly complementary to the existing programs of Drafting/Design; Heating, Ventilation, Air Conditioning and Refrigeration; and Welding. Complementary courses have been developed for each of these degrees with the intent of capitalizing on common student learning outcomes and naturally occurring cross-disciplinary content.

- b. Will approval of the proposed program require changes to any existing programs at the institution? If so, please describe.

Approval of this program will not require changes or adaptations to any existing programs at MSU Billings COT.

- c. Describe what differentiates this program from other, closely related programs at the institution (if appropriate).

Carpenters learn their trade through formal and informal training programs. To become a skilled carpenter usually takes between 3 and 4 years of both classroom and on-the-job training. While there are a number of different ways to obtain this training, in general, the more formalized the process, the more skilled students will become, and the more in demand by employers. Using the approach most commonly found in industry, this program is built upon a foundation of construction-carpentry theory and then applied with sufficient repetition to reinforce concepts in practical settings. The program incorporates the application of theory to the application of skill through 2 building projects: 1st-year students build a modular house; 2nd year students build a site-based home sponsored by the Billings Homebuilders Association.

- d. How does the proposed program serve to advance the strategic goals of the institution?

Goal #1: Student Success, Achievement, and Retention - In order to ensure that each student attending MSU-B COT has the opportunity to succeed and reach their educational goal, the University puts the planning and resources in place to maximize student success as measured by the student. Careful planning and forethought was devoted to the development of the program proposal for Construction Technology-carpentry.

Goal #2: Academic Excellence and Integrity – MSU-B COT maintains an atmosphere of excellence and completes all projects with integrity and as careful stewards of public resources. The six colleges at MSU-Billings participate in a self-evaluation and external review process in an effort to ensure the highest standards of academic excellence and integrity.

Goal #3 Planning and Innovation – MSU-B COT strives to remain on the cutting edge of new ideas, continually planning for its future. MSU-B purposefully plans its activities and continually uses innovation to further its mission and objectives. Studying the feasibility of the new Construction Technology-carpentry program began in 2005 at the request of local and regional residential and commercial builders.

Goal #4: Technology - Technology will be designed and used to further objectives of the University, community, economic development, and research to enhance the learning, business, and production environments of students, faculty, staff, and research personnel.

Development of the Construction Technology-carpentry program included plans to develop and deploy courses which study the latest building technologies and materials. To that end, MSU-B COT was successful in a bid to obtain a *Community Based Job Training Grant, implemented by the U. S. Department of Labor's Employment and Training Administration*. Monies awarded through this successful grant application support the development of curriculum and has provided funding to hire instructors.

Goal #5: Competitive Change – MSU-B COT responded to market changes with appropriate strategies that meet or exceed those of the competition with the development of this Construction Technology-carpentry program.

- e. Describe the relationship between the proposed program and any similar programs within the Montana University System. In cases of substantial duplication, explain the need for the proposed program at an additional institution. Describe any efforts that were made to collaborate with these similar programs; and if no efforts were made, explain why. If articulation or transfer agreements have been developed for the substantially duplicated programs, please include the agreement(s) as part of the documentation.

After Montana BoR adoption of the current Montana University System (MUS) initiatives, MSU-B COT has taken up the charge, through careful planning and industry partnership, to assist and address the specific initiative of **Workforce Training & Equipment for High Demand Fields in Montana**.

To meet the state's two-year educational initiatives, the proposed MSU-B COT Associate of Applied Science Construction Technology-Carpentry adds a specific and targeted professional-technical program to the existing complement of associate and certificates of applied science degrees in the Montana.

The U.S. Department of Labor Employment Training Administration awarded the Montana State University-Billings College of Technology with a US-DOL CBJT grant to create more training opportunities to meet the high demand for highly skilled construction workers across Montana. The National Center for Construction Education and Research (NCCER) curriculum has been adopted by all programs: Montana State University-Billings College of Technology; University of Montana; Montana Tech College of Technology (Butte); MSU-Northern (Havre); University of Montana-Missoula College of Technology as well as affiliate partners across the state. Since the inception of the project, four additional partners have become involved in Montana BILT: Miles Community College in Miles City, Flathead Valley Community College in Kalispell, and University of Montana-Helena College of Technology, Dawson Community College.

Although it may be perceived that programmatic duplication exists among these programs, factors that support the existence of all include: Increasing demand for skilled construction carpenters has exceeded the number of available graduates in all programs; and local residential and commercial construction needs are met when these programs are permitted to tailor program student learning outcomes to specific local and regional practices.

4. Program Details

- a. Provide a detailed description of the proposed curriculum. Where possible, present the information in the form intended to appear in the catalog or other publications. NOTE: In the case of two-year degree programs and certificates of applied science, the

curriculum should include enough detail to determine if the characteristics set out in Regents' Policy 301.12 have been met.

**Montana State University Billings College of Technology
Associate of Applied Science: Construction Technology-Carpentry**

This degree in will provide students with a foundation necessary to obtain employment in the construction industry with skills in residential and commercial construction. Students will learn skills in blueprint reading, computer aided drafting and design, construction layout, safety, residential construction, basic commercial and industrial construction, estimating, concrete and basic construction management. Students will apply these skills by performing a variety of hands-on building construction projects and field projects. They will also earn NCCER (National Center for Construction Education Research) Certification.

Upon successful completion of this program a student will be able to:

- Read blueprints
- Use computer technology for drafting and design
- Demonstrate use of construction safety
- Estimate materials and buildings costs for basic commercial, industrial and residential construction projects
- Lay out a building from a site plan
- Read plans and elevations
- Build concrete forms
- Frame a small building from the ground up
- Install doors and windows
- Install and finish simple drywall projects
- Frame with metal studs
- Describe the installation of electrical receptacles and light fixtures
- Install cabinetry
- Build simple stair systems
- Earn NCCER (National Center for Construction Education Research) Certification.

Required Course	Credits
CARP 120 Carpentry Basics and Rough-in Framing	5
CARP 130 Exterior Finishing, Stair Construction, and Metal Stud Framing	4
CARP 140 Introduction to Site Layout.....	3
CARP 150 Beginning Carpentry Practicum.....	3
CARP 152 Intermediate Carpentry Practicum.....	3
CARP 220 Interior Finishing	4
CARP 230 Advanced Roof, Floor, Wall, and Stair Systems	4
CARP 250 Advanced Carpentry Practicum.....	4
CARP 252 Capstone Carpentry Practicum	4
CMP 105 Introduction to Computers and Applications.....	3
COMT 109 Human Relations.....	3
CTBU 166 Principles of Applied Supervision	3
DRFT 108 Introduction to CAD.....	3
ENGL 145 Technical Communication	3
MATH 122 College Mathematics for Technology	3
TRID 110 Fundamentals of Construction Technology	2
TRID 112 Blueprint Reading for Construction	2
TRID 115 Using a Construction Calculator.....	1
TRID 120 Introduction to Concrete	2
TRID 130 Basic Rigging	1
TRID 131 Metal Building Construction	1

TRID 150 Environmental and Shop Practices	2
TRID 151 Welding	2
TRID 220 Advanced Concrete Working	3
Restricted Elective (see below).....	3

Suggested Plan of Study

First Semester	Credits
CARP 120	5
CARP 150	3
MATH 122.....	3
TRID 110.....	2
TRID 112.....	2
TRID 115.....	1
TRID 150.....	2
Total	18

Second Semester	Credits
CMP 105.....	3
COMT 109	3
CARP 130.....	4
CARP 140.....	3
CARP 152.....	3
TRID 120.....	2
Total	18

Third Semester	Credits
TRID 130.....	1
TRID 131.....	1
TRID 151.....	2
CTBU 166	3
DRFT 108	3
CARP 230.....	4
CARP 250.....	4
Total	18

Fourth Semester	Credits
ENGL 145	3
TRID 220.....	3
CARP 220.....	4
CARP 252.....	4
Restricted Elective	3
Total	17

Total for degree..... 71

Restricted Electives	Credits
CTBU 171 Introduction to Business	3
HVAC 110 Introduction to HVAC.....	4
TRID 125 Introduction to Flooring Installation	4
TRID 190 Introduction to Residential Wiring	3

Course Descriptions

CARP 120 Carpentry Basics and Rough-in Framing
5 cr. (2 lec/6 lab/wk) Corequisite: TRID 110 or instructor’s approval.

Introduces the carpentry trade, including history, career opportunities, and requirements. This course covers a variety of building materials, fasteners, and adhesives. It also covers installation procedures for windows and exterior doors. Skills required for framing a simple structure are studied and practiced.

CARP 130 Exterior Finishing, Stair Construction, and Metal Stud Framing
4 cr. (2 lec/4 lab/wk) Prerequisite: CARP 120 or instructor's approval.

Introduces students to materials and methods for sheathing, exterior siding, stairs, and roofing. Students will lay out and build a simple stair system as well as a metal stud wall with door and window openings.

CARP 140 Introduction to Site Layout
3 cr. (1 lec/4 lab/wk) Prerequisite: TRID 110 or instructor's approval.

Introduces the process of distance measurement as well as differential and trigonometric leveling for site layout. It covers the principles, equipment, and methods used to perform the site layout tasks that require making angular measurements. This course is designed to let students apply the blueprint reading skills learned so far to a practical exercise.

CARP 150 Beginning Carpentry Practicum
3 cr. (9 lab/wk) Prerequisites: CARP 120, TRID 112, and TRID 115 or instructor's approval.
Corequisite: CARP 130.

Provides hands-on experience in which the student applies, with minimal supervision, the basic skills and knowledge presented thus far in the NCCER Carpentry Program. This course is designed as a practical task-oriented application utilizing the skills covered in prerequisites as well as in parts of CARP 130.

CARP 152 Intermediate Carpentry Practicum
3 cr. (9 lab/wk) Prerequisites: CARP 120, CARP 150, TRID 110, TRID 112. Corequisite: CARP 130.

Provides hands-on experience in which the student applies with supervision the basic skills and knowledge presented thus far in the NCCER Carpentry Program. The course is designed as a practical task-oriented application utilizing the basic skills learned in CARP 120, TRID 110, TRID 112, and CARP 130. The course will emphasize basic application in the areas of exterior finishing and interior finishing.

CARP 220 Interior Finishing
4 cr. (2 lec/4 lab/wk) Prerequisites: CARP 120 and TRID 112 or instructor's approval.

Covers interior building materials. This course covers materials and installation techniques for interior trim, countertop, base cabinet, and wall cabinet. It also covers suspended ceiling materials, layout, and installation as well as wood and metal door installation.

CARP 230 Advanced Roof, Floor, Wall, and Stair Systems
4 cr. (2 lec/4 lab/wk) Prerequisites: CARP 130 and CARP 150 or instructor's approval.

Covers the installation methods and materials for various roofing systems. It covers a variety of flooring applications as well as interior wall construction for residential and commercial structures. It also covers advanced staircase construction.

CARP 250 Advanced Carpentry Practicum
4 cr. (12 lab/wk) Prerequisites: CARP 130, CARP 140, CARP 150, and CARP 220 or instructor's approval. Corequisite: CARP 230.

Provides students the opportunity to practice skills they have acquired in the entire carpentry program. It includes task-oriented projects in which students can apply many of the skills and knowledge that have been presented throughout the NCCER Carpentry Program. This course is designed as a practical task-oriented exercise utilizing a variety of skills covered in all the NCCER carpentry courses required for the AAS degree.

CARP 252 Capstone Carpentry Practicum
4 cr. (12 lab/wk) Prerequisites: CARP 120, CARP 130, CARP 140, CARP 150, CARP 152, CARP 230, and CARP 250, TRID 110, TRID 115. Corequisite: CARP 220.

Provides hands-on experience in which the student applies with MINIMAL supervision the skills and knowledge presented thus far in the NCCER Carpentry program. The course is designed as a practical task-oriented application utilizing the ADVANCED skills learned in CARP 220 and CARP 230. The course will

emphasize advanced application in the areas of exterior finishing and interior finishing.

COMT 109 Human Relations

3 cr. (3 lec/wk)

Offers a theoretical and practical understanding of communication processes in the working environment, self-awareness in that environment, and the individual's participation in these relationships. The course aims to develop the student's perception and expression skill to communicate successfully in a variety of work contexts.

CTBU 166 Principles of Applied Supervision

3cr. (3 lec/wk) Prerequisite: CMP 105 or consent of instructor.

Introduces students to supervision functions, principles, and contemporary issues in the modern workplace. Emphasis will be placed on practical applications and insights regarding supervisory applications, individual and group performance, workplace dynamics and change, and team-oriented environments. Students will explore key skills needed for effective supervision, supervisory challenges of the 21st century, and how supervisors operate in real situations.

CTBU 171 Introduction to Business

3 cr. (3 lec/wk)

Provides an overall picture of business operations. Specialized fields within business organizations are presented and analyzed. The role of business in today's society is examined and career opportunities in business are explored.

ENGL 145 Technical Communication

3 cr. (3 lec/wk) Prerequisite: ENGL 100, ENGL 102, or qualifying score on placement exam and CMP 105.

Introduces the student to the creation and evaluation of several kinds of written and oral technical communication.

MATH 122 College Mathematics for Technology

3 cr. (3 lec/wk) Prerequisite: MATH 103 or MATH 105 or appropriate placement score.

Applies math to problems drawn from diverse occupational fields. Provides college level study of measurement, algebra, geometry, and trigonometry as needed to solve mathematical applications in a trade or technical work environment.

TRID 110 Fundamentals of Construction Technology

2 cr. (1 lec/2 lab/wk)

Introduces basic concepts in using construction-related safety apparatus. It also covers proper safety procedures in the operation of hand and power tools. It reviews and applies construction-related math.

TRID 112 Blueprint Reading for Construction

2 cr. (2 lec/wk)

Concentrates on concepts associated with blueprint reading, sketching, and interpreting light commercial and residential drawings. It includes instruction in the recognition of construction materials, procedures, specifications, and methods of estimating construction costs from blueprints. This course also covers trade-specific symbols found on construction drawings.

TRID 115 Using a Construction Calculator

1 cr. (1 lec/wk)

Explains uses and needs for quality construction calculators. This course is designed to help students become proficient in solving common construction problems using the Construction Master Pro calculator.

TRID 120 Introduction to Concrete

2 cr. (1 lec/2 lab/wk) Prerequisite: TRID 110 or instructor's approval.

Provides students with basic skills and knowledge in the area of concrete and reinforcing materials. The course will also provide a limited opportunity for students to be involved in hands-on experience in the

forming, reinforcing, handling, and placing of concrete.

TRID 130 Basic Rigging

1 cr. (1 lec/wk)

Explains how ropes, chains, hoists, loaders, and cranes are used to move material and equipment from one location to another on a job site. It describes inspection techniques and load-handling safety practices as well as reviews American National Standards Institute (ANSI) hand signals.

TRID 131 Metal Building Construction

1 cr. (1 lec/wk)

Introduces the basic structural components, fastening methods, and assembly techniques for metal buildings. It provides an overview of the materials and procedures used in application of roofs, wall panels, windows, doors, and flashings relating to metal buildings.

TRID 150 Environmental and Shop Practices

2 cr. (1 lec/2 lab/wk)

Informs students on safety, hazardous materials and toxic waste. Students are given a working knowledge of tool use, measuring devices, fasteners, use of shop manuals, and hazardous waste precautions and handling procedures.

TRID 151 Welding

2 cr. (1 lec/2 lab/wk)

A theory and practical course designed to give students experience in oxyacetylene welding, cutting, and arc welding processes used in the trade and industrial field applications. Various types of welders and electrodes are used for practice on weld coupons.

TRID 190 Introduction to Residential Wiring

3 cr. (2 lec/2 lab/wk)

Introduces wiring methods and materials used in single- and two-family dwellings. It covers basic installation and replacement techniques for residential electrical components.

TRID 220 Advanced Concrete Working

3 cr. (1 lec/4 lab/wk) Prerequisite: TRID 120.

Provides basic knowledge of concrete materials and tools and provides hands-on experience in which the student applies with supervision those basic skills and knowledge presented in the area of concrete. The course is designed as a practical task-oriented application utilizing the basic skills learned in TRID 121 and TRID 220. The course will emphasize the advanced application in the area of concrete foundations, flatwork, forms, reinforcing, handling, and placing concrete.

Describe the planned implementation of the proposed program, including estimates of numbers of students at each stage.

**MSU-Billings College of Technology
Associate of Applied Science Construction Technology-Carpentry**

	Summer 2005	Fall 2006	Spring 2007	Fall 2007	Spring 2008
Implementation	Advertise new program	Admit 1 st student cohort		Admit 2nd student cohort; returning second year students from 2007	Graduate 1st student cohort
# New Students		18	18	27	9

The one-year enrollment and matriculation patterns seen here reflect a commonly occurring phenomenon in high-demand, two-year professional-technical programs. After completing the first year of instruction, students are immediately employable in basic, entry-level carpentry-assistant positions. This program's first-year students were employed. Another phenomenon that occurs is after working in the field for some length of time, students return to their two-year program to complete their degree in order to move along the career pathway and obtain employment in positions with greater responsibility and higher pay scales.

5. Resources

- a. Will additional faculty resources be required to implement this program? If yes, please describe the need and indicate the plan for meeting this need.

Yes.

MSU-B COT has allocated a permanent faculty line in the budget for one tenure-track position. A second non-tenure track position was secured through the use of grant funding. At the conclusion of the grant, the 2nd faculty position will be moved to a permanent College personnel budget line.

- b. Are other, additional resources required to ensure the success of the proposed program? If yes, please describe the need and indicate the plan for meeting this need.

Start up costs associated with the implementation of this program were funded through a \$50,000 grant from the Montana Contractor's Association and Celebrate Billings. A federal grant from the US-Department of Labor Community Based Job Training was received and is currently being administered by the MSU-Billings College of Technology (\$1.98 million) and a State OCHE grant for 2 year new program development have been added to the financial resources garnered to support this program. Additional funding was received from external support from local and regional construction industries. Two local construction companies have pledged \$100,000 over five years to support student scholarships. Students in the program will building two homes. The first year students will construct a modular home and the second year students will construct a fully completed 3,000 square foot home on a 10,000 square foot lot near the College. Profits generated from home sales will be reinvested into the program and construction of future homes. For example, the class of

2007 generated a net profit from the sale of the modular home of \$17,000. Continuing costs will be funded through permanent budgets using revenue from tuition and student FTE reimbursement.

Facilities/Supplies

MSU Billings' and COT executive administrators provide financial and facility resources sufficient to support continuity and consistency in the educational program. Costs will be funded through tuition, fees and the State allocation as in previous years. Classroom instruction is held on the College of Technology campus. Laboratory instruction for first year students will take place on the property of the School District No. 2 Career Center located adjacent to the COT where students will construct a modular home. During the spring of 2007, students from the 2007 Construction-Carpentry cohort constructed a modular home (materials paid for by the US-DOL grant) and sold the home to the highest bidder as per state guidelines. The proceeds from the sale of the Modular home (\$17,000) will be reinvested into the construction of the 2008 modular. The second year students in the Construction-Carpentry program will construct a full scale home near the COT in partnership with the Billings Homebuilder's Association who is financing the construction of the home. All other instruction and lab work will take place on the MSU-Billings COT campus.

Equipment

The lab component of the curriculum is taught at the COT, the modular home location at the Career Center, and on-site at the off-campus home construction site provided by the Billings Homebuilder's Association. All laboratory equipment includes a wide variety of equipment usage including: table saws, jointers, portable power tools, and other stationary power equipment used in the field. Start up costs associated with the implementation of this program were funded through a \$50,000 grant from the Montana Contractor's Association and Celebrate Billings, a US-Department of Labor CBJT grant and a State OCHE grant for 2 year new program development.

6. Assessment.
How will the success of the program be measured?

The success and effectiveness of the program will be measured based on the following factors: student enrollment, retention, national exam pass rates, employer satisfaction and through data gather from annual reports and the program review process.

Program Review:

MSUB is a student centered campus that focuses on excellence in teaching and student learning. During the last several years MSUB has re-examined, strengthened, and coordinated its assessment process. While institutional evaluation and assessment is by its nature continuously evolving, the University has made progress toward an institutional assessment lattice integrated into the university's strategic plans. In fall 2004 the university initiated its second strategic initiatives document for the period 2005-2010. The document was collaboratively developed with faculty and staff and implemented in fall 2005 as the University instituted a Continuous Quality Improvement concept in all its practices. The CQI process is continual and cyclical, allowing for annual progress checks and data informed decision making. The Continuous Quality Improvement Steering Committee oversees implementation of the CQI concept in all University processes. The Committee maintains a website and publishes a monthly Newsletter *CQI-FYI*.

Each division of the university (Academic Affairs, Administrative Affairs, Athletic Affairs, Facility Services, Graduate Studies, Grants and Sponsored Programs, Information Technology, Institutional Research, Library, Public Service Units (KEMC/YPR and the Montana Center on Disabilities) and Student Affairs) developed goals aligned with the university strategic initiatives Both quantitative and qualitative measures are required to assess performance and outcomes.

Annual program reports are completed in each division, each college, and each department within each college and administrative divisions with sub-units to review and assess compliance with the University's overall mission. The CQI process is an ongoing evaluation of the University's mission and role and a continual attempt to match our offerings to constituent needs. Coordination of assessment is overseen by the CQI Steering Committee and the Academic Senate. The committee meets on a regular basis to discuss, review and provide feedback to the various areas of the university. The outcomes are used in planning and implementing changes for improvement. The Co-Chairs of the Committee make a monthly presentation of the committee's activities and progress on assessment to the Chancellor and his Cabinet during regularly scheduled cabinet meeting. It involves administration, faculty, students, the Construction Technology-Carpentry Program Advisory Board (PAB), graduates and employers. A model was developed to identify the evaluative components, input sources, process, timeline, and outcomes criteria.

- Does the program or function assessed move the University closer to its mission?
MSU-Billings provides a university experience characterized by:
Excellent Teaching
Support for Individual Learning
Engagement in Civic Responsibility
Intellectual, Cultural, Social & Economic Community Enhancement
- Does the program or function assessed move the University closer to its standard of *Access and Excellence*?
- Does the program or function assessed contribute to fulfillment of the University's Strategic Initiatives?
Programs—Create and maintain distinctive, vital academic programs and services for 21st Century learners
Faculty Excellence—Cultivate excellence in & outside the classroom, in scholarly endeavors & exemplary service through faculty & staff development, support for scholarship, continuing assessment, & recognition of professional service
Needs of Learners—Identify the needs of all learners & provide access to a university experience that fulfills both individual goals & societal needs
Social Equity—Model social equity and consciousness by assuring that all members of our campus community grow because of their University experience

Research Initiatives—Increase the stature, professionalism & research initiatives of all academic programs & student services

Economic Access—Augment local, state & regional economic development through the strength of the University's financial base & our learners' contributions to their communities

Global Engagement—Increase staff, faculty & student awareness, understanding, & involvement in the international community

University Infrastructure—Ensure an administrative, operational and physical infrastructure that fully supports excellence

- Does the program or function assessed help the University attain its Vision?

Montana State University-Billings will be recognized as a regional leader for:

Teaching & Learning

Translating Knowledge into Practice

Researching for the Future

Accepting Leadership for Intellectual, Cultural, Social & Economic Development Beyond University Boundaries

Assessment Data—Indicators of Student Success

Annual Reports: provide evidence of progress toward division/unit goals, data to support this progress and other information as appropriate for the area.

Periodic Program Review: MSU-B COT complies with the Montana Board of Regents Policy 300.3 under Academic Affairs Program Review. MSU-B COT will review all of its programs at least once every seven (7) years. A campus schedule of review for our programs has been filed with the Office of the Commissioner of Higher Education. Pending Level II BoR approval of the Construction Technology-carpentry Program, that schedule will be updated. The results of our internal Construction Technology-carpentry program review will be prepared for submission to the Montana Board of Regents at the appropriate November BoR meeting. This report focuses especially on the decisions associated with the future of each program, following its review.

Student Ratings of Instruction: In general, evaluation of faculty is governed by the Collective Bargaining Agreement between the Montana Board of Regents of Higher Education and Vocational-Technical Educators of Montana. Faculty member evaluation procedures are recognized to be a cooperative effort between the faculty member and his/her supervisor with the purpose of achieving excellence in the area of effective and purposeful instruction and job performance.

Student Exam Pass Rate: Successful completion of the Construction-Carpentry program provides graduates with skills required of a carpenter in a variety of building construction settings common in both rural and metropolitan areas. Upon successful completion of this program, students will be eligible for certification with the National Center for Construction Education and Research (NCCER) National Registry. Successful completion of all NCCER instructional outcomes and the Associate of Applied Science degree lead to a student's NCCER national certification.

Surveys: Graduate and Employer satisfaction surveys will be administered on an annual basis. Results of these surveys will be considered by the Dean, Associate Dean, Department Chair, members of the Program Advisory Committee. Recommendations from the Committee for needed revisions to course content or presentations are to be discussed with and adopted by teaching faculty each fall semester.

The timeline for evaluation affords ample time for program revision based on the evaluative data, changing trends in medical coding and billing industry standards. Components of the evaluation model include the organization and administration of the program, curriculum, resources, and student/graduates.

7. Process Leading to Submission

Describe the process of developing and approving the proposed program. Indicate, where appropriate, involvement by faculty, students, community members, potential employers, accrediting agencies, etc.

Spring of 2004

MSU-Billings College of Technology was contacted by residential and commercial construction companies in the Billings area with a request to provide Construction Technology-Carpentry educational opportunities.

A College of Technology Construction Technology-carpentry Program Development Committee made up of construction executives and College of Technology faculty and administrators was formed to investigate the viability of this proposal.

The Dean of the College of Technology brought the proposal to Celebrate Billings, a community based committee to support educational opportunities within the city. Celebrate Billings funded a startup costs of developing a proposed new program.

The College of Technology committee formed a subcommittee to create a proposed plan of study, a business plan, and a formal proposal which was submitted to the Provost.

Approval was given by the Provost to move forward to create curriculum and a full program proposal.

Spring Semester 2006

The curriculum was proposed and routed through the University curriculum approval process. Proposals for new curriculum begin at the faculty level (internal) and involve input from advisory committees (external) and/or accreditation agencies (external). In instances such as this where permanent faculty are not in place at the time of the proposal to create required documentation, the curriculum is developed by existing faculty, staff, advisory committee members and industry to create the initial submission.

Documentation was then submitted to the appropriate Program Curriculum Committee for final review.

The proposal was reviewed by the appropriate Department Chair, College Curriculum Committee, Dean of the College, MSU-Billings Undergraduate Curriculum Committee, Faculty Academic Senate, Provost and finally the Chancellor

Board of Regents request for approval of a Level I program proposal was submitted.

Spring 2006

Notification of BoR Level I program approval was received.
Student recruitment and program marketing began.

Fall 2006

Admitted 1st cohort of Construction Technology-Carpentry students.