

APPENDIX 1

A.A.S. Degree in Plumbing Approval Form

APPENDIX 2

A.A.S. Degree in Plumbing
Draft Catalogue Copy

Draft Catalogue Copy for the
Associate of Applied Science Degree
In Plumbing

FRESHMAN YEAR
Fall Semester

CIS 110, Introduction to Computers	3 credits
MAAS 106, Elementary Technical Mathematics	3 credits
* PLMB 100, Introduction to the Plumbing Trades	4 credits
HPE 234, First Aid and CPR	2 credits
DRFT 131, Technical Graphics I	4 credits
TOTAL:	16 credits

Spring Semester

ENGL 111, Written Communication I	3 credits
* PLMB 110, Introduction to Plumbing and Drawing	1 credit
* PLMB 120, Introduction to Piping Systems	3 credits
* PLMB 125, Introduction to Plumbing Fixtures	2 credits
TECH 100, Industrial Safety/Waste Management	2 credits
METL 140, Introduction to Welding and Cutting	3 credits
* PLMB 170, Plumbing Codes	2 credits
TOTAL:	16 credits

SOPHOMORE YEAR
Fall Semester

* PLMB 200, Pipe Fitting Tools & Motorized Equipment	3 credits
* PLMB 210, Advanced Blueprint Reading	2 credits
* PLMB 230, Hangers, Supports, and Field Testing	2 credits
TSCI 205, Distribution Systems	3 credits
SPCH 141, Fundamentals of Speech	3 credits
TOTAL:	13 credits

Spring Semester

EET 110, Electronics Survey I	3 credits
* PLMB 250, Special Piping	3 credits
* PLMB 260, Intro Control Circuit Troubleshooting	2 credits
* PLMB 270, Hydronic Heating & Cooling Systems	2 credits
* PLMB 280, Energy Management	1 credit
* PLMB 285, System Start-up and Shutdown	1 credit
TSCI 206, Applied Water Hydraulics	3 credits
TOTAL:	15 credits

APPENDIX 3

A.A.S. Degree in Plumbing Course Descriptions

PROGRAM/DEGREE REVISION FORM

NEW DROPPED MAJOR REVISION FOR INFORMATION ONLY

College College of Technical Sciences Program Area Plumbing AAS Degree Date 3-31-03

Submitter _____ Chair/Dean *Gregory O. Keyel* Date 3-31-03
signature signature

Please provide a brief explanation & rationale for the proposed revision(s)

New Associate of Applied Science Degree in Plumbing

signatures on original indicate approval of entire packet including course descriptions

Please provide in the space below a "before & after" picture of the program with the changes in the program noted. Attach appropriate Course Revision Forms. Please indicate changes by shading the appropriate cells.

FRESHMAN YEAR

Courses to be taken Fall Semester

CIS	110	Intro to Computers	3
MAAS	106	Elementary Technical Math	3
PLMB	100	Intro to the Plumbing Trades	4
HPE	234	First Aid & CPR	2
DRFT	131	Technical Graphics I	4
			16

Courses to be taken Spring Semester

ENGL	111	Written Communication I	3
PLMB	110	Intro to Plumbing and Drawing	1
PLMB	120	Intro to Piping Systems	3
PLMB	125	Intro to Plumbing Fixtures	2
TECH	100	Industrial Safety & Waste Mgmt	2
METL	140	Intro to Welding & Cutting	3
PLMB	170	Plumbing Codes	2
			16

SOPHOMORE YEAR

Courses to be taken Fall Semester

PLMB	200	Pipe Fitting Tools and Motorized Equip.	3
PLMB	210	Advanced Blueprint Reading for Plumb.	2
PLMB	230	Hangers, Supports, Testing Piping & E	2
TSCI	205	Distribution Systems	3
SPCH	141	Fund. Of Speech	3
			13

Courses to be taken Spring Semester

EET	110	Electronics Survey I	3
PLMB	250	Special Piping	3
PLMB	260	Intro to Control Circuit Troubleshooting	2
PLMB	270	Hydronic Heating & Cooling Systems	2
PLMB	280	Energy Management	1
PLMB	285	System Startup & Shutdown	1
TSCI	206	Applied Water Hydraulics	3
			15

60

COURSE REVISION FORM

NEW DROPPED MAJOR REVISION FOR INFORMATION ONLY

College College of Technical Sciences Program Area Plumbing Date 3-31-03

Submitter _____ Chair/Dean _____ Date _____
Signature Signature (indicates "college" level approval)

Please provide a brief explanation & rationale for the proposed revision(s):
NEW COURSE FOR PLUMBING AAS DEGREE

Please provide the following information:

College:

Program Area:

Date:

Course Prefix & No.: PLMB 100

Course Title: Intro to the Plumbing Trades

Credits: 4

Required by: Plumbing Associate of Applied Science

Selective in:

Elective in:

General Education:

Lecture:

Lecture/Lab: X

Contact hours lecture: 1

Contact hours lab: 6

Proposed or New Catalog Description (include all prerequisites):

This course covers tools in the plumbing trade and how to use them: tools powered by electricity, batteries, and pressurized air, such as drills, saws, grinders, sanders, slings, hardware, hoists, rigging operations, critical safety issues, and accepted rigging techniques and practices. Course fee \$25.00

Course Outcome Objectives:

- Identification equipment
- Safe operations of trade equipment
- Maintenance of hand and power tools used in the plumbing industry
- Safe applications of rigging operations

Additional instructional resources needed (including library materials, special equipment, and facilities). Please note: approval does not indicate support for new faculty or additional resources.

Plumbing hand tools such as pipe wrenches, hammers, screw drivers, ripping bars, wrenches, pliers and wire cutters, levels, rulers measuring tools, clamps, saws, chisels, plumb bobs, wedges, chains, hand wenches, wire brushes, shovels. Power drills, saws, grinders and sanders, hydraulic jacks, slings, hitches, rigging hardware, hoists, rigging operations and practices.

Faculty

COURSE REVISION FORM

NEW DROPPED MAJOR REVISION FOR INFORMATION ONLY

College College of Technical Sciences Program Area Plumbing Date 3-27-03

Submitter _____ Chair/Dean _____ Date _____
Signature Signature (indicates "college" level approval)

Please provide a brief explanation & rationale for the proposed revision(s):

NEW COURSE FOR PLUMBING AAS DEGREE

Please provide the following information:

College:

Program Area:

Date:

Course Prefix & No.: PLMB 110

Course Title: Intro to Plumbing and Drawing

Credits: 1

Required by: Plumbing AAS degree

Selective in:

Elective in:

General Education:

Lecture: X

Lecture/Lab:

Contact hours lecture: 1

Contact hours lab:

Proposed or New Catalog Description (include all prerequisites):

This course introduces the history of plumbing from ancient times to current plumbing training programs, + also covers professional practices, career opportunities, and some basic safety. This course reviews the blueprints that are included in a building's plans and then moves on to specific plumbing drawings, such as isometric and oblique pictorial drawings, orthographic drawings, and schematic drawings. It also covers drawings of fixtures, assembly drawings, and cutaway drawings. This course includes an application of plumbing math.

Course Fee \$5.00

Course Outcome Objectives:

- Interpret and draw plumbing drawing in isometric, oblique, orthographic and schematic views
- Identify symbols for pipe fittings
- Interpretation of assembly drawings
- Understanding and application of math used in offsets, bends, and layouts.

Additional instructional resources needed (including library materials, special equipment, and facilities). Please note: approval does not indicate support for new faculty or additional resources.

New faculty

COURSE REVISION FORM

NEW X DROPPED _____ MAJOR REVISION _____ FOR INFORMATION ONLY _____

College College of Technical Sciences Program Area Plumbing Date 3-31-03

Submitter _____ Chair/Dean _____ Date _____
Signature Signature (indicates "college" level approval)

Please provide a brief explanation & rationale for the proposed revision(s):
NEW COURSE FOR PLUMBING AAS DEGREE

Please provide the following information:

College:

Program Area:

Date:

Course Prefix & No.: PLMB 120

Course Title: Intro to Piping Systems

Credits: 3

Required by: Plumbing AAS Degree

Selective in:

Elective in:

General Education:

Lecture:

Lecture/Lab: X

Contact hours lecture: 1

Contact hours lab: 4

Proposed or New Catalog Description (include all prerequisites):

This course describes the various types of plastic piping and fittings, what each is used for, and the measuring, cutting, and joining techniques for each type; hangers and supports used with plastic pipe; various types of copper tubing and fittings, measuring, cutting, and joining techniques; two types of cast-iron pipe (hub and no-hub). *This course also*
~~Describes~~ carbon steel pipe; ^{AN} overview of the drain, waste, and vent (DWV) systems; basics of traps, drains, vents, DWV fittings, and cleanouts; ~~overview~~ ^{AN} overview of the water distribution system.
Course Fee \$30.00

Course Outcome Objectives:

- Application of proper procedures for preparation, cutting, and joining of plastic pipe and fittings
- Application of proper procedures for preparation, cutting, and joining of copper tubing and fittings
- Application of proper procedures for preparation, cutting, and joining of ferrous pipe and fittings

Additional instructional resources needed (including library materials, special equipment, and facilities). Please note: approval does not indicate support for new faculty or additional resources.

Faculty

PLMB 120 course rev form 3-31-03

COURSE REVISION FORM

NEW X DROPPED _____ MAJOR REVISION _____ FOR INFORMATION ONLY _____

College College of Technical Sciences Program Area Plumbing Date 3-31-03

Submitter _____ Chair/Dean _____ Date _____
Signature Signature (indicates "college" level approval)

Please provide a brief explanation & rationale for the proposed revision(s):
NEW COURSE FOR PLUMBING AAS DEGREE

Please provide the following information:

College:

Program Area:

Date:

Course Prefix & No.: PLMB 125

Course Title: Introduction to Plumbing Fixtures

Credits: 2

Required by: Plumbing AAS degree

Selective in:

Elective in:

General Education:

Lecture: X

Lecture/Lab:

Contact hours lecture: 1

Contact hours lab: 2

Proposed or New Catalog Description (include all prerequisites):

This course covers the various types of fixtures that plumbers install, including sinks and lavatories, bathtubs and showers, water closets and urinals, garbage disposals and dishwashers, and laundry trays and mop basins.

Course Fee \$15.00

Course Outcome Objectives:

- Identification of fixtures
- Location and installation of fixtures

Additional instructional resources needed (including library materials, special equipment, and facilities). Please note: approval does not indicate support for new faculty or additional resources.

Faculty

COURSE REVISION FORM

NEW X DROPPED _____ MAJOR REVISION _____ FOR INFORMATION ONLY _____

College College of Technical Sciences Program Area Plumbing Date 3-31-03

Submitter _____ Chair/Dean _____ Date _____
Signature Signature (indicates "college" level approval)

Please provide a brief explanation & rationale for the proposed revision(s):
NEW COURSE FOR PLUMBING AAS DEGREE

Please provide the following information:

College:

Program Area:

Date:

Course Prefix & No.: PLMB 170

Course Title: Plumbing Codes

Credits: 2

Required by:

Selective in:

Elective in:

General Education:

Lecture: X

Lecture/Lab:

Contact hours lecture: 2

Contact hours lab:

Proposed or New Catalog Description (include all prerequisites):

This course is a ~~continued~~ study of the State of Montana plumbing Code as it regulates environmental sanitation for the protection of public health. *It* also includes a study of the materials and installation methods that require a minimum of service and maintenance.

Course Fee \$5.00

Course Outcome Objectives:

- Successful completion of the State of Montana Plumbing Code Exam.

Additional instructional resources needed (including library materials, special equipment, and facilities). Please note: approval does not indicate support for new faculty or additional resources.

Faculty

COURSE REVISION FORM

NEW X DROPPED ____ MAJOR REVISION ____ FOR INFORMATION ONLY ____

College _____ Program Area _____ Date 3-31-03

Submitter _____ Chair/Dean _____ Date _____
Signature Signature (indicates "college" level approval)

Please provide a brief explanation & rationale for the proposed revision(s):

Please provide the following information:

College:

Program Area:

Date:

Course Prefix & No.: PLMB 200

Course Title: Pipe Fitting Tools and Motorized Equipment

Credits: 3

Required by:

Selective in:

Elective in:

General Education:

Lecture:

Lecture/Lab: X

Contact hours lecture: 1

Contact hours lab: 4

Proposed or New Catalog Description (include all prerequisites):

This course covers general hand tools safety and procedures for identifying, selecting, inspecting, using, and caring for pipe vises and stands, pipe wrenches, levels, pipe fabrication tools, and pipe bending and flaring tools.

Course Fee \$25.00

Course Outcome Objectives:

- Identification of hazards and application of safe procedures when using electric and pneumatic power tools
- Proper use of engine driven generators, welding machines, air compressors, pumps, forklift trucks and hydraulic cranes.

Additional instructional resources needed (including library materials, special equipment, and facilities). Please note: approval does not indicate support for new faculty or additional resources.

Faculty

COURSE REVISION FORM

NEW X DROPPED MAJOR REVISION FOR INFORMATION ONLY

College College of Technical Sciences Program Area Plumbing Date 3-31-03

Submitter _____ Chair/Dean _____ Date _____
Signature Signature (indicates "college" level approval)

Please provide a brief explanation & rationale for the proposed revision(s):
NEW COURSE FOR PLUMBING DEGREE

Please provide the following information:

College:

Program Area:

Date:

Course Prefix & No.: PLMB 210

Course Title: Advanced Blueprint Reading

Credits: 2

Required by: Plumbing AAS Degree

Selective in:

Elective in:

General Education:

Lecture: X

Lecture/Lab:

Contact hours lecture: 2

Contact hours lab:

Proposed or New Catalog Description (include all prerequisites):

This course introduces plot plans, structural drawings, elevation drawings, as-built drawings, equipment arrangement drawings, isometric drawings, spool sheets, and detail sheets in the plumbing industry.

Course Fee \$5.00

Course Outcome Objectives:

- Interpretation and application of plot plans, equipment location plans, piping orthographic drawings, structural steel plans, piping ISOs, and detail sheets.
- Interpretation and application of line indexes, drawing indexes, and instrument summaries

Additional instructional resources needed (including library materials, special equipment, and facilities). Please note: approval does not indicate support for new faculty or additional resources.

Faculty

COURSE REVISION FORM

NEW X DROPPED ___ MAJOR REVISION ___ FOR INFORMATION ONLY ___

College College of Technical Sciences Program Area ___ Plumbing Date 3-31-03

Submitter _____ Chair/Dean _____ Date _____
Signature Signature (indicates "college" level approval)

Please provide a brief explanation & rationale for the proposed revision(s):
NEW COURSE FOR PLUMBING DEGREE

Please provide the following information:

College:

Program Area:

Date:

Course Prefix & No.: PLMB 230

Course Title: Hangers, Supports, and Field Testing

Credits: 2

Required by: Plumbing AAS Degree

Selective in:

Elective in:

General Education:

Lecture: X

Lecture/Lab:

Contact hours lecture: 2

Contact hours lab:

Proposed or New Catalog Description (include all prerequisites):

This course describes pipe hangers and supports found on the job site and the selection and performance of field tests of plumbing installation.

Course Fee \$10.00

Course Outcome Objectives:

- Interpretation of pipe support drawings and symbols
- Determination of field placement of hangers
- Selection and performance of pretests
- Application of service flow tests
- Interpretation of head pressure tests, hydrostatic tests, and steam blow tests

Additional instructional resources needed (including library materials, special equipment, and facilities). Please note: approval does not indicate support for new faculty or additional resources.

Faculty

COURSE REVISION FORM

NEW DROPPED MAJOR REVISION FOR INFORMATION ONLY

College College of Technical Sciences Program Area Plumbing Date 3-31-03

Submitter _____ Signature _____ Chair/Dean _____ Signature (indicates "college" level approval) _____ Date _____

Please provide a brief explanation & rationale for the proposed revision(s):

NEW COURSE FOR PLUMBING DEGREE

Please provide the following information:

College:

Program Area:

Date:

Course Prefix & No.: PLMB 250

Course Title: Special Piping

Credits: 3

Required by: Plumbing AAS degree

Selective in:

Elective in:

General Education:

Lecture:

Lecture/Lab: X

Contact hours lecture: 1

Contact hours lab: 4

Proposed or New Catalog Description (include all prerequisites):

This course explains how to assemble flared and compression joints using copper tubing and the installation of hydronic piping.

Course Fee \$30.00

Course Outcome Objectives:

- Soldering and brazing of joints using copper tubing
- Bending pipe to specified radius
- Installation of hydraulic fitted compression joints
- Preparation of grooved pipe couplings

Additional instructional resources needed (including library materials, special equipment, and facilities). Please note: approval does not indicate support for new faculty or additional resources.

Faculty

COURSE REVISION FORM

NEW X DROPPED MAJOR REVISION FOR INFORMATION ONLY

College College of Technical Sciences Program Area Plumbing Date 3-31-03

Submitter Signature Chair/Dean Signature (indicates "college" level approval) Date

Please provide a brief explanation & rationale for the proposed revision(s):
NEW COURSE FOR PLUMBING DEGREE

Please provide the following information:

College:

Program Area:

Date:

Course Prefix & No.: PLMB 270

Course Title: Hydronic Heating and Cooling Systems

Credits: 2

Required by: Plumbing AAS Degree

Selective in:

Elective in:

General Education:

Lecture:

Lecture/Lab: X

Contact hours lecture: 1

Contact hours lab: 2

Proposed or New Catalog Description (include all prerequisites):

This course covers operating principles, piping systems, and preventive maintenance pertaining to the servicing of boilers, chillers, chilled water systems, absorption systems, steam systems, and system traps.

Course Fee \$15.00

Course Outcome Objectives:

- Performance of maintenance procedures of boiler systems
- Theory and application of balancing procedures for chilled water systems
- Balance testing of chilled water systems

Additional instructional resources needed (including library materials, special equipment, and facilities). Please note: approval does not indicate support for new faculty or additional resources.

Faculty

COURSE REVISION FORM

NEW X DROPPED ___ MAJOR REVISION ___ FOR INFORMATION ONLY ___

College College of Technical Sciences Program Area Plumbing Date 3-31-03

Submitter _____ Chair/Dean _____ Date _____
Signature Signature (indicates "college" level approval)

Please provide a brief explanation & rationale for the proposed revision(s):
NEW COURSE FOR PLUMBING DEGREE

Please provide the following information:

College:

Program Area:

Date:

Course Prefix & No.: PLMB 280

Course Title: Energy Management

Credits: 1

Required by: Plumbing AAS Degree

Selective in:

Elective in:

General Education:

Lecture: X

Lecture/Lab:

Contact hours lecture: 1

Contact hours lab:

Proposed or New Catalog Description (include all prerequisites):

This course explains how computer and microprocessor controls are used to manage zoned HVAC systems in residential and commercial buildings.

Course Fee \$5.00

Course Outcome Objectives:

- Interpretation of circuit diagrams
- Zone balance in commercial and residential HVAC systems

Additional instructional resources needed (including library materials, special equipment, and facilities). Please note: approval does not indicate support for new faculty or additional resources.

Faculty

COURSE REVISION FORM

NEW X DROPPED MAJOR REVISION FOR INFORMATION ONLY

College College of Technical Sciences Program Area Plumbing Date 3-31-03

Submitter _____ Chair/Dean _____ Date _____
Signature Signature (indicates "college" level approval)

Please provide a brief explanation & rationale for the proposed revision(s):
NEW COURSE FOR PLUMBING DEGREE

Please provide the following information:

College:

Program Area:

Date:

Course Prefix & No.: PLMB 285

Course Title: System Startup and Shutdown

Credits: 1

Required by: Plumbing AAS Degree

Selective in:

Elective in:

General Education:

Lecture: X

Lecture/Lab:

Contact hours lecture: 1

Contact hours lab:

Proposed or New Catalog Description (include all prerequisites):

This course covers procedures for the start-up of hot water and steam heating systems and chilled water systems. Emphasis is on start-up after initial equipment installation or after an extended period of shut-down.

Course Fee \$5.00

Course Outcome Objectives:

- Application of proper procedures to prepare heating and chilling systems after initial installation
- Application of proper procedures to prepare heating and chilling systems for extended periods of shut-down
- Testing of heating and chilling systems after start-up

Additional instructional resources needed (including library materials, special equipment, and facilities). Please note: approval does not indicate support for new faculty or additional resources.

Faculty

APPENDIX 4

Montana State University-Northern Plumbing Advisory Board Members

**Members of the
Montana State University-Northern
Plumbing Advisory Board**

- 1) Bob Mack
Master Plumbing & Heating
Whitefish, Montana
President, Associated Plumbing and Heating Contractors of Montana

- 2) Bob Nault
Nault Plumbing & Heating
Havre, Montana

- 3) Steve Nelson
Missouri River Mechanical
Great Falls, Montana
Chair, Montana Board of Plumbers

- 4) Bill Schaff
Garden City Plumbing & Heating
Missoula, Montana
Chair, MSU-Northern Plumbing Advisory Board

- 5) Robert Tehle
Alpine Plumbing & Heating
Billings, Montana

- 6) Mike Waldenberg
Central Plumbing & Heating, Inc.
Great Falls, Montana
Vice-Chair, MSU-Northern Plumbing Advisory Board

- 7) Chris White
Bozeman Plumbing & Heating
Bozeman, Montana