# **APPENDIX 1**

# A.A.S. Degree in Plumbing Approval Form

## ACADEMIC SENATE PROPOSAL TRACKING SHEET

(Document To Be Originated By Academic Senate Secretary On Canary Color Paper) All proposals MUST have their originating college faculty body (Ex. Nursing, Technical Sciences, Arts & Sciences, Education) approval and must be signed by the submitter and the college chair/dean before being submitted to the academic senate secretary.

- Submit all proposals (using the appropriate Academic Senate program/degree and/or course revision forms) to the 1. Academic Senate Secretary.
- 2. The Academic Senate Secretary logs and numbers items and forwards them to the appropriate Academic Senate subcommittee(s): Teacher Education (if applicable), General Education (if applicable), or Curriculum,
- The Academic Senate subcommittee(s) consider(s) the proposal. If approved, the proposal is forwarded to the next 3. committee. If a committee disapproves the proposal, the originator may request that the item be forwarded to the next body for consideration. The committee will provide written rationale to the originator when a proposal is disapproved and the proposal is returned to the originator.
- 4. The Academic Senate considers the proposal and approves or disapproves. If approved, the proposal is forwarded to the Full Faculty for consideration. If the Academic Senate disapproves the proposal, the originator may request that the item be forwarded to the Full Faculty for consideration. The Academic Senate will provide written rationale to the originator when proposals are disapproved and the proposal is returned to the originator.
- 5. The Full Faculty considers academic senate approved proposals. If faculty approve, the proposal will then be forwarded to the Provost. The Provost approves or disapproves the proposal. If approved, the proposal is then forwarded to the Chancellor.
- 7. The Chancellor approves or disapproves the proposal.

Subcommittee and Academic Senate college representatives will notify their respective colleges' of the progress of submitted proposals or the proposal may be tracked via the web page --

http://www.msun.edu/admin/provost/asproposals.htm

Documentation and forms for the curriculum process is also available on the web page: http://www.msun.edu/admin/provost/asforms.htm

#### (If a proposal is disapproved at any level, it is returned through the Academic Senate secretary to the Chair/Dean of the submitting college who then notifies the originator.)

Proposal # 02-30 Title: PINMBING - ZAA 1200

Approved

Signature

Approved

(proposal explanation, submitter and college chair/dean signatures on attached program/degree or course revision form)

Received by ACAD Senate Forwarded to Teacher Ed Council

Forwarded to Gen Ed Committee

Returned to ACAD Senate Forwarded to Curriculum Committee

Returned to ACAD Senate for Vote

Sent to Provost's office for Full Faculty vote Voted on at Full Faculty meeting

Forwarded to Provost for Approval/Disapproval

Forwarded to Chancellor for Approval/Disapproval

Copies sent to originating college and registrar's office C/data/proposaltracking sheet ACAD 10 10 01

Date Signature Apprøveð Disapproved Signature Disapproved byec Disapproved Approved Disapproved Approved 7) () Signature Disapproved Approved Signature Date

Disapproved

Disapproved

Date

# **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

#### 

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**

00	dises to be taken i an bemester		
110	Intro to Computers	3	
106	Elementary Technical Math	3	
100	Intro to the Plumbing Trades	4	
234	First Aid & CPR	2	
131	Technical Graphics I	4	
			16
Cou	rses to be taken Spring Semester		
111	Written Communication I	3	
110	Intro to Plumbing and Drawing	1	
120	Intro to Piping Systems	3	
125	Intro to Plumbing Fixtures	2	
100	Industrial Safety & Waste Mgmt	2	
140	Intro to Welding & Cutting	3	
170	Plumbing Codes	2	
			16
	110 106 100 234 131 <b>Cou</b> 111 110 120 125 100 140	<ul> <li>106 Elementary Technical Math</li> <li>100 Intro to the Plumbing Trades</li> <li>234 First Aid &amp; CPR</li> <li>131 Technical Graphics I</li> <li>Courses to be taken Spring Semester</li> <li>111 Written Communication I</li> <li>110 Intro to Plumbing and Drawing</li> <li>120 Intro to Plumbing Fixtures</li> <li>120 Industrial Safety &amp; Waste Mgmt</li> <li>140 Intro to Welding &amp; Cutting</li> </ul>	110Intro to Computers3106Elementary Technical Math3100Intro to the Plumbing Trades4234First Aid & CPR2131Technical Graphics I4Courses to be taken Spring Semester111Written Communication I3110Intro to Plumbing and Drawing1120Intro to Plumbing Fixtures2100Industrial Safety & Waste Mgmt2140Intro to Welding & Cutting3

#### 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		
	Cour	ses to be taken Spring Semester				
EET	<b>Cou</b> 110	rses to be taken Spring Semester Electronics Survey I	3			
EET PLMB			3 3			
	110	Electronics Survey I				
PLMB	110 250	Electronics Survey I Special Piping	3			
PLMB PLMB	110 250 260	Electronics Survey I Special Piping Intro to Control Circuit Troubleshooting	3 2			

## PLMB285System Startup & ShutdownTSCI206Applied Water Hydraulics

3

	Signature		Signature (indicates "college" level approva	I)
Submitter		Chair/Dean		Date
College Colle	ege of Technical	Sciences Progr	am Area Plumbing	Date <u>3-31-03</u>
NEW <u>X</u> I	DROPPED	MAJOR REVIS	SION FOR INFORMATIO	N ONLY

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:		
<b>General Education:</b>		
Lecture:		
Lecture/Lab:	Х	
<b>Contact hours lecture:</b>	1	
<b>Contact hours lab:</b>	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

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NEW X DROPPED MAJOR REVISION FOR INFORMATION ONLY

College <u>College of Technical Sciences</u> Program Area <u>Plumbing</u> Date <u>3-27-03</u>

Submitter \_\_\_\_\_ Chair/Dean \_\_\_\_\_ Date \_\_\_\_\_

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 110Course Title:Intro to Plumbing and DrawingCredits:1

**Required by:** 

Plumbing AAS degree

Selective in: Elective in: General Education:

X

Lecture: 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 I halso covers drawings of fixtures, assembly drawings, and cutaway drawings. This course includes an application of plumbing math.

Course Fee \$5.00

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#### **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

NEW X DROPPED	MAJOR REVISION	FOR INFORMATION	ONLY
College <u>College of Tech</u>	nical Sciences Program Area _	Plumbing	Date <u>3-31-03</u>
SubmitterSignature	Chair/Dean Signature	(indicates "college" level approval	Date
	nation & rationale for the pr RSE FOR PLUMBING AAS		
Please provide the followin College: Program Area: Date:	g information:		
Course Prefix & No.: Course Title: Credits:	PLMB 120 Intro to Piping Systems 3		
Required by: Selective in: Elective in: General Education: Lecture:	Plumbing AAS Degree		
Lecture/Lab: Contact hours lecture: Contact hours lab:	X 1 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 for each type; basics of Describes carbon steel pipe; overview of the drain, waste, and vent (DWV) systems; basics of traps, drains, vents, DWV fittings, and cleanouts, overview of the water distribution system.

#### **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.

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College College of Tech	nical Sciences Program Area Plumbing	Date <u>3-31-03</u>
Submitter	Chair/Dean	Date
	anation & rationale for the proposed revision(s) RSE FOR PLUMBING AAS DEGREE	:
Please provide the following	ng 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:		
<b>General Education:</b>		
Lecture:	х	
Lecture/Lab:		
Contact hours lecture:	1	
<b>Contact hours lab:</b>	2	

lavatories, bathtubs and showers, water closets and urinals, garbage disposals and dishwasher, and laundry trays and mop basins. Course Fee \$15.00

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### **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.

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PLMB 125 course rev form 3-31-03

College College of T	<u>[echnical Sciences]</u> Program Area	PlumbingDa	ate <u>3-31-03</u>
Submitter	Chair/Dean Signature (indi		Date
Signature	Signature (indi	cates "college" level approval)	
· · ·	lanation & rationale for the propo JRSE FOR PLUMBING AAS DI		
Please provide the followi	ng information:		
College: Program Area:			
Date:			
Course Prefix & No.:			
Course Title: Credits:	Plumbing Codes 2		
citulis.	2		
Required by:			
Selective in: Elective in:			
Elective in: General Education: Lecture:	х		
Elective in: General Education: Lecture: Lecture/Lab:			
Elective in: General Education: Lecture: Lecture/Lab: Contact hours lecture:	<b>X</b> 2		w cash
Elective in: General Education: Lecture: Lecture/Lab: Contact hours lecture:		15W	en can
Elective in: General Education: Lecture: Lecture/Lab: Contact hours lecture: Contact hours lab:	2	Jow	u car
Elective in: General Education: Lecture: Lecture/Lab: Contact hours lecture: Contact hours lab: Proposed or New Catalo	2 g Description (include all prere	quisites):	
Elective in: General Education: Lecture: Lecture/Lab: Contact hours lecture: Contact hours lab: Proposed or New Catalo This course is a continued environmental sanitation for materials and installation p	2	quisites): umbing Code as it reg <b>Pa</b> lso includes a stud	gulates ly of the
Elective in: General Education: Lecture: Lecture/Lab: Contact hours lecture: Contact hours lab: Proposed or New Catalo This course is a continued environmental sanitation f	2 g Description (include all prere study of the State of Montana ph for the protection of public health	quisites): umbing Code as it reg <b>Pa</b> lso includes a stud	gulates ly of the
Elective in: General Education: Lecture: Lecture/Lab: Contact hours lecture: Contact hours lab: Proposed or New Catalo This course is a continued environmental sanitation for materials and installation p	2 g Description (include all prere study of the State of Montana plu or the protection of public health methods that require a minimum of	quisites): umbing Code as it reg <b>Pa</b> lso includes a stud	gulates ly of the

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

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PLMB 170 COURSE REV FORM 3 31 03

NEW <u>X</u>	DROPPED MAJOR REVISIO	ON FOR INFORMATION ONLY
College	Program Area	Date <u>3-31-03</u>
Submitter	Chair/Dean	Date Signature (indicates "college" level approval)

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

Please provide the followin	g information:
College:	<i>6</i>
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:	Х
<b>Contact hours lecture:</b>	1

#### Proposed or New Catalog Description (include all prerequisites):

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This course covers general hand toolg 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:**

**Contact hours lab:** 

- 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

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NEW X DROPPED	MAJOR REVISION	_ FOR INFORM	ATION ONLY
College College of Techni	cal Sciences Program Area	Plumbing	Date <u>3-31-03</u>
SubmitterSignature	Chair/Dean Signature (in	dicates "college" level a	pproval) Date
Please provide a brief explanation & rationale for the proposed revision(s): NEW COURSE FOR PLUMBING DEGREE			
Please provide the following College: Program Area: Date:	; information:		
Course Prefix & No.: Course Title: Credits:	PLMB 210 Advanced Blueprint Readin 2	g	
Required by:	Plumbing AAS Degree		
Selective in: Elective in: General Education:			

Lecture:	X
Lecture/Lab:	
Contact hours lecture:	2
<b>Contact hours lab:</b>	

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.

NEW X DROPPED	MAJOR REVISION	FOR INFORMATI	ON ONLY	
College <u>College of Technical Sciences</u> Program Area Plumbing Date <u>3-31-03</u>				
SubmitterSignature	Chair/Dean	cates "college" level appro	val) 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 230Course Title:Hangers, Supports, and Field Testing				
Credits:	2	C		
Required by:	Plumbing AAS Degree			
Selective in: Elective in: General Education:				
Lecture:	х			
Lecture/Lab: Contact hours lecture: Contact hours lab:	2			
	Description (include all prere angers and supports found on t		selection and	

Course Fee \$10.00

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### **Course Outcome Objectives:**

- Interpretation of pipe support drawings and symbols
- Determination of field placement of hangers
- Selection and performance of pretests

performance of field tests of plumbing installation.

- 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.

NEW X DROPPED	MAJOR REVISIONFOR INFORMATION ONLY
College College of Te	echnical Sciences Program Area Plumbing Date 3-31-03
Submitter	Chair/Dean Date Date
Please provide a brief expla	nation & rationale for the proposed revision(s):
NEW COUR	RSE FOR PLUMBING DEGREE
Please provide the following College: Program Area: Date: Course Prefix & No.: Course Title:	g information: PLMB 250 Special Piping
Credits:	3
Required by:	Plumbing AAS degree
Selective in: Elective in: General Education: Lecture: Lecture/Lab: Contact hours lecture: Contact hours lab:	X 1 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.

NEW X DROPPED	MAJOR REVISION FOR INFORMAT	FION ONLY	
College <u>College of Technical Sciences</u> Program Area <u>Plumbing</u> Date <u>3-31-03</u>			
Submitter	Chair/Dean	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.: Course Title:	& No.: PLMB 260 Intro to Control Circuit Troubleshooting		
Credits:	2		
Required by:			
Selective in: Elective in: General Education:			
Lecture: Lecture/Lab: Contact hours lecture: Contact hours lab:	X 1 2		

#### Proposed or New Catalog Description (include all prerequisites):

This course covers the operation, testing, and adjustment of conventional and electronic thermostats as well as the operation of common electrical and electronic circuits used to control HVAC systems. Course Fee \$30.00

#### **Course Outcome Objectives:**

- Analysis of circuit diagrams for electronic controls used in heating and cooling equipment
- System trouble shooting and repair of heating and cooling 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

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	chnical Sciences Program Area	
Submitter	Chair/Dean Signature (indicate	Date
Signature	Signature (indicate	s "college" level approval)
Please provide a brief expl	anation & rationale for the propose	d revision(s):
NEW COURSE FO	OR PLUMBING DEGREE	
Please provide the following	ng information:	
College:		
Program Area:		
Date:		
Course Prefix & No.:	PLMB 270	
<b>Course Title:</b>	Hydronic Heating and Cooling Systems	
Credits:	2	
Required by:	Plumbing AAS Degree	
Selective in:		
Elective in:		
<b>General Education:</b>		
Lecture:		
Lecture/Lab:	х	
Contact hours lecture:	1	
Contact hours lab:	2	

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

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PLMB 270 course rev form 3-31-03

NEW X_ DROPPED ]	MAJOR REVISION FOR	INFORMATIO	ON ONLY
College College of Technica	Sciences Program Area	Plumbing	Date <u>3-31-03</u>
Submitter	Chair/Dean	"college" level approv	val) 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 280		
Course Title:	Energy Management		
Credits:	1		

**Required by:** 

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Selective in: Elective in: General Education:

Lecture: X Lecture/Lab: 1 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

Plumbing AAS Degree

#### **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

PLMB 280 course rev form 3-31-03

NEW X_ DROPPED MAJOR REVISION FOR INFORMATION ONLY			
College <u>College of Technical Sciences</u> Program Area <u>Plumbing</u> Date <u>3-31-03</u>			
Submitter	Chair/Dean	(indicates "college" level approv	al) 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.: Course Title:	PLMB 285 System Startup and Shutdo	own	
Credits:	1		
Required by:	Plumbing AAS Degree		
Selective in: Elective in: General Education:			
Lecture:	х		
Lecture/Lab: Contact hours lecture: Contact hours lab:	1		

#### 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.

# **APPENDIX 4**

# Montana State University-Northern Plumbing Advisory Board Members

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

- Bob Mack Master Plumbing & Heating Whitefish, Montana President, Associated Plumbing and Heating Contractors of Montana
- Bob Nault Nault Plumbing & Heating Havre, Montana
- Steve Nelson Missouri River Mechanical Great Falls, Montana Chair, Montana Board of Plumbers
- Bill Schaff
   Garden City Plumbing & Heating
   Missoula, Montana
   Chair, MSU-Northern Plumbing Advisory Board
- 5) Robert Tehle Alpine Plumbing & Heating Billings, Montana
- Mike Waldenberg Central Plumbing & Heating, Inc. Great Falls, Montana Vice-Chair, MSU-Northern Plumbing Advisory Board
- 7) Chris White Bozeman Plumbing & Heating Bozeman, Montana