

**ACADEMIC SENATE PROPOSAL TRACKING SHEET**  
**(Document To Be Originated By the Academic Senate Secretary On Canary Color Paper)**

<b>Proposal #</b> 15.15	<b>Title:</b> Water Quality Technology – Wastewater Collection Certificate
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(Proposal explanation, submitter and college dean signatures on attached program/degree or course revision form.)

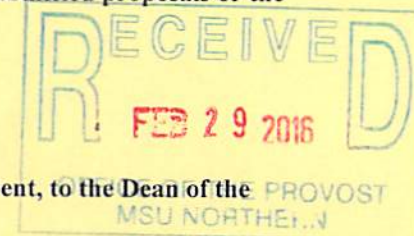
**All proposals MUST have their originating college faculty body (Ex. Arts & Sciences, Education and Nursing; Technical Sciences) approval and must be signed by the submitter and the college dean before being submitted to the Academic Senate Secretary.**

1. Submit all proposals (using the appropriate Academic Senate program/degree and/or course revision forms or General Education Inclusion form) to the Academic Senate Secretary. **NOTE: Level 1 or Level 2 forms must be submitted concurrent with this proposal where applicable. For Education proposals, PEU approval must be received prior to forwarding the proposal to the Senate.**
2. The Academic Senate Secretary logs and numbers items and forwards them to the appropriate Academic Senate subcommittee(s): General Education (if applicable), or Curriculum. A transmittal e-mail will be sent to the Recording Secretary of the receiving committee, cc Provost's Administrative Assistant, by the Academic Senate Secretary. A digital copy of the proposal will be linked on the Academic Senate Proposal page by the Academic Senate Secretary.
3. The Academic Senate subcommittee(s) consider(s) the proposal. If approved, the proposal is returned to the Academic Senate Secretary for forwarding to the next 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, via the Academic Senate, when a proposal is disapproved and the proposal is returned to the originator. Upon completion of committee action, the proposal will be returned to the Academic Senate Secretary, and a transmittal e-mail sent by the Committee Recorder to the Senate Secretary, cc Provost's Administrative Assistant.
4. The Academic Senate considers the proposal and recommends approval or disapproval. If approved, the proposal is forwarded to the Provost for consideration. If the Academic Senate disapproves the proposal, the originator may request that the item be forwarded to the Full Faculty for consideration, utilizing the procedures set forth in the Senate Bylaws. The Academic Senate will provide written rationale to the originator when proposals are disapproved and the proposal is returned to the originator.
5. Approved proposals will be forwarded to the Provost. The Provost approves or disapproves the proposal. If approved, the proposal is then forwarded to the Chancellor. From this point forward, the Provost's Administrative Assistant will update the Proposal page on the website by contacting the webmaster.
7. The Chancellor approves or disapproves the proposal.
8. The proposal will then either be implemented or referred to MSU for further action. The tracking page on the Provost site will be updated as required.

**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/senate/proposals.htm>**

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

**\*\*\*\*\* (If a proposal is disapproved at any level, it is returned through the Academic Senate secretary and the Senate President, to the Dean of the submitting college who then notifies the originator.**



See back for tracking form



	Date	Action Taken	Signature	Date	Comments/Reason for Disapproval	Sent to	Date	Transmittal E-mail sent
*Abstract received by Senate Secretary		Copy to Senate President. Forward to Provost.						
*Provost		<input type="checkbox"/> Abstract Approved <input type="checkbox"/> Disapproved						
Received by Senate Secretary	11/19/15	Tracking form initiated	<i>[Signature]</i>					
General Education Committee (if applicable)	11/30/15	<input checked="" type="checkbox"/> Approved <input type="checkbox"/> Disapproved	<i>Gary L. Sullivan</i>	11/30/15		Senate Sec.	12/1/15	
Curriculum Committee (if applicable)	1-26-16	<input checked="" type="checkbox"/> Approved w/ correction <input type="checkbox"/> Disapproved	<i>[Signature]</i>	1-26-16	Should be CERTIFICATE OF APPLIED SCIENCE	Senate Sec.	2/2/16	Wait to forward
Academic Senate	2-9-16	<input checked="" type="checkbox"/> Approved <input type="checkbox"/> Disapproved	<i>[Signature]</i>			Senate Sec.	2/9/16	Interested to Provost office
Full Faculty (if necessary)		<input type="checkbox"/> Approved <input type="checkbox"/> Disapproved						
Provost		<input checked="" type="checkbox"/> Approved <input type="checkbox"/> Disapproved	<i>Wm. J. Rugg</i>	3-15-16				
Chancellor		<input checked="" type="checkbox"/> Approved <input type="checkbox"/> Disapproved	<i>Dwight D. Kegel</i>	3-16-2016				
MSU	July 2016	<input checked="" type="checkbox"/> Approved <input type="checkbox"/> Disapproved						
BOR		<input checked="" type="checkbox"/> Approved <input type="checkbox"/> Disapproved	<i>approved</i>	2016				
NWCCU		<input type="checkbox"/> Approved <input type="checkbox"/> Disapproved	<i>September BOR meeting moved to NWCCU</i>					
Provost		Advise originating college and Academic Senate of status. Update Web page.						
Registrar		Catalog/Policy Manual Update						

NOTE: The secretary of the Academic Senate will update the Academic Senate Proposal web page from initial receipt until the proposal reaches the Provost. The Provost's Administrative Assistant will ensure that the current status of each proposal is maintained on the Academic Senate Proposal web page from that point forward.

\*Abstract and pre-approval required for new programs ONLY.

Academic Senate Form 1 (Revised 3/21/2012)



May 19-20 2016

171-2805-R0516

**ITEM**

**Request for authorization to offer Wastewater Collection Certificate**

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**THAT**

The Montana Board of Regents grants Montana State University Northern approval to offer a Wastewater Collection Certificate to our students.

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**EXPLANATION**

The purpose of this curriculum proposal is to add a departmental certificate program to MSU Northern's Water Quality Technology: Environmental Health Associate of Applied Science (AAS) degree program. This proposal is unique and innovative in that it utilizes; courses that are already a part of the AAS Water Quality Technology program as well as; courses that are already a part of the Montana Environmental Training Center's (METC) programs, which are housed at MSU Northern, to recertify licensed wastewater treatment operators in the state of Montana.

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**ATTACHMENTS**

Academic Proposal Request Form  
Curriculum Proposal Form  
MSU Northern paperwork in PDF

**Montana Board of Regents  
ACADEMIC PROPOSAL REQUEST FORM**

Item Number: 171-2805-R0516

Meeting Date: May 19-20 2016

Institution: Montana State University Northern

CIP Code: 15.0506

Program Title: Wastewater Collection Certificate

Please mark the appropriate type of request and submit with an Item Template and any additional materials, including those listed in parentheses following the type of request. For more information pertaining to the types of requests listed below, how to complete an item request, or additional forms please visit the Academic Affairs Handbook.

     **A. Notifications:**

Notifications are announcements conveyed to the Board of Regents at the next regular meeting.

     **1a. Placing a program into moratorium (Document steps taken to notify students, faculty, and other constituents and include this information on checklist at time of termination if not reinstated)**

     **1b. Withdrawing a program from moratorium**

     **2. Intent to terminate an existing major, minor, option or certificate – Step 1 (Phase I Program Termination Checklist)**

     **3. Campus Certificates- Adding, re-titling, terminating or revising a campus certificate of 29 credits or less**

     **4. BAS/AA/AS Area of Study**

     **B. Level I:**

Level I proposals are those that may be approved by the Commissioner of Higher Education. The approval of such proposals will be conveyed to the Board of Regents at the next regular meeting of the Board.

     **1. Re-titling an existing major, minor, option or certificate**

     **2. Adding a new minor or certificate where there is a major or an option in a major (Curriculum Proposal Form)**

     **3. Revising a program (Curriculum Proposal Form)**

     **4. Distance or online delivery of an existing degree or certificate program**

     **5. Terminating an existing major, minor, option or certificate – Step 2 (Completed Program Termination Checklist)**

     **Temporary Certificate or AAS Degree Program**

Approval for programs under this provision will be limited to two years. Continuation of a program beyond the two years will require the proposal to go through the normal Level II Proposal approval process.

**Montana Board of Regents  
ACADEMIC PROPOSAL REQUEST FORM**

     **C. Level I with Level II Documentation:**

This type of proposal may go to the Board as a Level I item if all Chief Academic Officers are in agreement. If consensus among the Chief Academic Officers is not reached, however, the item will go to the Board as a Level II request.

     1. Consolidating existing programs and/or degrees (Curriculum Proposal Form)

  X **D. Level II:**

Level II proposals require approval of the Board of Regents. These requests will go to the Board in a two-meeting format, the first being as informational and the second as action.

     1. Re-titling a degree (ex. From B.A. to B.F.A)

  X 2. Adding a new minor or certificate where there is no major or option in a major (Curriculum Proposal Form)

     3. Establishing a new degree or adding a major or option to an existing degree (Curriculum Proposal Form)

     4. Forming, eliminating or consolidating a college, division, school, department, institute, bureau, center, station, laboratory or similar unit (Curriculum Proposal Form or Center Proposal Form, except when eliminating or consolidating)

     5. Re-titling a college, division, school, department, institute, bureau, center, station, laboratory or similar unit

**Specify Request:**

This proposal is unique and innovative in that it utilizes; courses that are already a part of the AAS Water Quality Technology program as well as; courses that are already a part of the Montana Environmental Training Center's (METC) programs, which is housed at MSU Northern, to recertify licensed water treatment, water distribution system, wastewater treatment, industrial wastewater and on-site waste water operators in the state of Montana.

**Montana Board of Regents**  
**CURRICULUM PROPOSAL FORM**

**1. Overview**

The purpose of this curriculum proposal is to add the certificate program of Wastewater Collection to MSU Northern's Water Quality Technology: Environmental Health Associate of Applied Science (AAS) degree program. This proposal is unique and innovative in that it utilizes; courses that are already a part of the AAS Water Quality Technology program as well as; courses that are already a part of the Montana Environmental Training Center's (METC) programs, which is housed at MSU Northern, to recertify licensed water treatment, water distribution system, wastewater treatment, industrial wastewater and on-site wastewater operators in the state of Montana.

**2. Provide a one paragraph description of the proposed program. Be specific about what degree, major, minor or option is sought.**

To obtain a departmental certificate in Wastewater Collection, the program requires completion of all classes specifically designed for certificate program. The curriculum is multi-entry and can be completed in one year. Classes are offered using various delivery methods such as on-line classes (Desire2Learn), classroom, and short courses. Students can begin a certificate program with any of the required classes at any time. After completing the certificate program students will have the basic knowledge needed for entry level employment in the area of wastewater collection. Students will be ready to sit for the Montana State Certification Examination and become certified as an "Operator-in-Training" in their chosen field. Students will also have specific knowledge of drinking water and/or wastewater systems that employers have identified as pertinent for job applicants to have prior to employment. Or students can roll their one year certificate into their first year of the AAS degree in Water Quality Technology and only have one year left to complete the AAS Water Quality Technology degree.

**3. Need****A. To what specific need is the institution responding in developing the proposed program?**

The need for water and wastewater operators in municipal and private water and wastewater systems is nearing critical mass, not only nationally but right here in Montana, with the average age of certified operators being 45. Many more operators are retiring from systems than are entering systems especially in small systems, of which Montana has many. This proposal aims to bring students interested in working in both large and small municipalities and small municipalities into the field. Then provide them with enough information in one year that they can sit for the state certification exam and successfully pass the exam the first time. Hopefully by completing the certificate program they will see the value in the Water quality program and how close they are to having the AAS degree and continue on and complete the Water Quality Technology AAS degree thus making them even more valuable to an employer.

**Montana Board of Regents  
CURRICULUM PROPOSAL FORM**

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

Those students looking to get into the work force quickly can complete one of the four certificates within one year, sit for a state exam and apply for a job. Or they can be working on a certificate, apply for a job and get a job, complete the certificate and then sit for the exam.

This program will provide graduates of MSU Northern's Civil Engineering Technology Bachelor of Science degree program, Plumbing Technology Associate of Applied Science Technology program, and Water Quality Associate of Applied Science Technology Program more avenues of employment. By completing one of the four certificates in the water quality program not only will they be earning a departmental certificate from MSU Northern but by completing the required Backflow Prevention Assembly Testers core course they will be nationally certified as a backflow prevention assembly tester and by sitting for a state of Montana operator certification exam they will be certified by the state of Montana as an Operator-in-Training as either a Water Operator, Wastewater Operator, Water Distribution Operator, Industrial Wastewater operator or On-site Wastewater Operator.

Other constituencies (water and wastewater operators, sanitarians, engineers, plumbers, and industry representatives) already utilizing the Montana Environmental Training Center's programs that may benefit from the certificate program are those water and wastewater operators already working in municipalities and other systems who would like to further their education and would see these certificate programs as a way to do so by being able to take online courses and get college credit for taking some of METC's courses.

**C. What is the anticipated demand for the program? How was this determined?**

Anticipated demand for this program is high, if as many courses as possible are offered as online courses by MSU Northern and short three to five day courses by METC. This format is highly desirable for those already working in the industry and for those that are place bound across the state wishing to get into the industry. In addition, some of Montana's larger municipalities are voicing interest in this program format to the METC Interim Director as a possible method for personnel training. In 2009 the Interim Director also had a list of 126 potential students whom could still possibly be potential students.

Demand for the MSU Northern's AAS Water Quality Technology program first surfaced in 2009; when the Montana Environmental Training Center began conducting surveys for the need of the program to return and; when then MSU Northern Provost Joe Callahan began receiving letters from those in the water and wastewater industry including municipalities large and small, state agencies, engineering firms and even the Environmental Protection Agency. This prompted the Provost to encourage the Board of Regents to lift the moratorium. Since this time, the Montana Department of Environmental Quality (DEQ) has noted an increase in the lack of trained operators for systems in Montana. In addition, the US EPA has identified the water and wastewater industry as an area for returning military veterans to find employment.

In March of 2009 the DEQ's Water and Wastewater Operator Certification program provided METC the following data: 224 (14%) active operators in Montana were 62 years of age or older. And, another 82 active operators were between the ages of 60 and 62 (5.1%). Thus, 19.1% of the 1,602 certified water and wastewater operators in Montana in 2009 were over the age of 60 and closing in on retirement.

The January/February 2011 edition of Water Efficiency stated that "In the study done by the American Water Works Association (AWWA) and the Water Environment Federation (WEF) the highest level of need for non-administrative employees was in the area of certified plant operators in both drinking and wastewater plants." AWWA also identified in its 2010 State of the Industry report workforce issues as one of the top five



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CURRICULUM PROPOSAL FORM**

topics of concern. This problem has been increasing in intensity since AWWA first brought its concern to the attention of the industry in 2005. It is now estimated that 40% of the workforce will retire in the next 10 years.

Every public community, which is defined as 15 hook-ups or having a population of 25 full-time residents, requires a certified water treatment operator and wastewater treatment operator to monitor, report data, operate and maintain its water and wastewater treatment systems. The demand for students from the water quality program has increased by at least 100 percent. Salaries for water quality technicians range from \$20,000 up to \$50,000 per year.

**4. Institutional and System Fit**

**A. What is the connection between the proposed program and existing programs at the institution?**

Currently, MSU Northern is the only institution in Montana that provides an AAS degree for students seeking employment as water and wastewater operators. Most of the core courses for the proposed program are courses that are part of MSU Northern's AAS Water Quality Technology degree or METC's recertifying programs.

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

It will add some courses to the curriculum and require that METC attached assignments and a grading system to those courses which will become a part of the certificate program.

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

Not appropriate, no closely related programs at MSU Northern.

**D. How does the proposed program serve to advance the strategic goals of the institution?**

The proposed program serves to provide education that can be used directly and immediately in the water and wastewater industry. Completion of the program prepares students to sit for the state certification exams. This is a tenant of the mission of MSU Northern.

**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.**

No other similar programs exist within the Montana University System.

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CURRICULUM PROPOSAL FORM

5. 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.

Wastewater Collection Option – Total Credits Required =30

Core Courses (22 credits) required for each certificate would be:

TSCI 110	Intro to Water & Wastewater	online	4 credits
METC	Environmental Health & Safety for W/WW Operators	online	1 credit
MATH 111	Technical Math	online	3 credits
AGTE 206	Applied Water Hydraulics	online	3 credits
WRIT 108	Elementary Technical Writing	online	3 credits
COMX 115	Intro to Interpersonal Communications	online	3 credits
METC	Backflow Assembly Testers Course	traditional	3 credits
METC	Spring, Summer or Fall Water Schools	traditional	<u>2 credits</u>
			22 credits

Required Courses (5 credits)

NEW	Wastewater Collection Systems	online	3 credits
METC	Pumps & Motors Operation & Maintenance	traditional	1 credit
EPA	Wastewater	CD-ROM	<u>1 credit</u>
			5 credits

Elective Courses (3 credits) (traditional type delivery – some could be put online)

N-CC	Applied Physics for Water and Wastewater		1 credit
METC	Chlorine Safety, Design, Maintenance & Repair for W & WW		0.5 credit
METC	Water and Wastewater Disinfection		0.5 credit
METC	Collection Mains: Installation, Maintenance & Repair		1 credit
METC	Confined Space Safety & Trenching & Shoring Course		1 credit
METC	Cross Connection Control Specialist Course		2 credits
METC	Cross Connections for Small Systems		0.5 credit
METC	Small Water & Wastewater System Operations		0.5 credit
ELEC 101	Electrical Fundamental I		3 credits
METC	Emergency Preparedness		0.5 credit
METC	Safety & Security for Water and Wastewater Systems		0.5 credit
METC	Flow Measurement, Sampling and Metering		0.5 credit
METC	Wastewater Regulations		0.5 credit
N-CC	Gas Chlorination for Water and Wastewater		1 credit
N-CC	Hypo-chlorination for Water and Wastewater		1 credit
PLMB 120	Intro to Piping Systems		3 credits
PLMB 100	Intro to Plumbing Trades		4 credits
METC	On-site Wastewater Systems		1 credit
METC	Pumps & Motors Operation & Maintenance		1 credit
WLDG 260	Repair and Maintenance Welding		3 credits
WLDG 111	Welding Theory I Practical		2 credits

**Montana Board of Regents  
CURRICULUM PROPOSAL FORM**

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

Anticipated demand for this program is high, if as many courses as possible are offered online by MSU Northern and as short three to five day courses by METC. This format is highly desirable for those already working in the industry and for those that are place bound across the state wishing to get into the industry. In addition, some of Montana's larger municipalities are voicing interest in this program format as a possible method for personnel training and advancement. In 2009 METC's Director has a list of 126 potential students whom could still be potential students.

The need for water and wastewater operators in municipal and private water and wastewater systems is nearing critical mass, not only nationally but right here in Montana, with the average age of certified operators being 52 in Montana. Many more operators are retiring from systems than are entering systems especially in small systems, of which Montana has many.

**6. 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.**

Most likely not as the plan is to use the current faculty to teach Northern's courses and to use METC's staff and instructors to teach the METC courses.

**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.**

No.

**7. Assessment**

**How will the success of the program be measured?**

In four ways.

- 1) By enrollment in the certificate programs and graduates from the certificate programs.
- 2) By increased enrollment in the AAS program and graduates from the AAS program.
- 3) By increased number of certified water and wastewater operators in Montana.
- 4) By graduates employed as operators and technicians in-state and out-of-state.

**8. 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.**

MSU Northern's Faculty approved the program. MSU Northern students in the BS Civil Engineering, AAS Plumbing and AAS Water Quality Technology degree programs were reviewed and provided input as to the value of the certificate program to students. An advisory committee was made up of managers and operators as well as other professionals in the field. The committee advised MSU Northern on the curriculum content and made suggestions on how to deliver the certificate programs from a distance and possible on-site workshops.

**Montana Board of Regents  
CURRICULUM PROPOSAL FORM**







## COURSE REVISION FORM

NEW X DROPPED \_\_\_\_\_ MAJOR REVISION \_\_\_\_\_ FOR INFORMATION ONLY \_\_\_\_\_

College CEASN Program Area Environmental Health & Safety  
Submitter Carol A. Rappner Water & Wastewater Personnel Date \_\_\_\_\_  
Signature Signature (indicates "college" level approval)

Please provide a brief explanation & rationale for the proposed revision(s):  
This course is part of the proposed courses for the water quality certificate programs. It is designed to introduce health and safety techniques used in water and wastewater operations.

### Please provide the following information:

College: CEASN  
Program Area: Water Quality  
Date: 10/30/12  
Course Prefix & No.: TSCI 1xx

Course Title: Environmental Health & Safety for Water & Wastewater Personnel  
Credits: 1 credit

Required by: Water Quality – all certificates

Selective in:

Elective in:

General Education:

Lecture: XXX

Lecture/Lab:

Gradable Lab:

Contact hours lecture: 15 hours

Contact hours lab:

Current Catalog Description (include all prerequisites):

There is no current description.

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

Provide students with fundamental knowledge of maintaining a safe, healthful work environment, as well as protecting the local community and environment from potential hazards generated by water and wastewater system activities.

### Course Outcome Objectives:

Students who successfully complete this course will have gained the knowledge to protect themselves against (1) blood borne pathogens and (2) heat and cold stress as well as the importance of (1) personal protective equipment, (2) hearing protection, (3) respiration protection, (4) hazard communication, (5) laboratory safety, and (6) chemical security and spill cleanup. Students will also understand the components of lockout/tagout, permit required confined space and trenching, shoring and excavation safety programs.

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

Possible demonstration by local utilities on lockout/tagout, confined space entry and trenching, shoring and excavation.

## COURSE REVISION FORM

NEW X DROPPED \_\_\_\_\_ MAJOR REVISION \_\_\_\_\_ FOR INFORMATION ONLY \_\_\_\_\_

College CEASN Program Area Water Quality Date \_\_\_\_\_

Submitter Carol A. Rejzbrand Dean Carol A. Rejzbrand Date \_\_\_\_\_  
Signature Signature (indicates "college" level approval)

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

This course is part of the proposed courses for the water quality certificate programs. It is designed to introduce students to wastewater lagoon systems which are commonly used in small municipalities to treat wastewater.

**Please provide the following information:**

College: CEASN  
Program Area: Water Quality  
Date: 10/22/12  
Course Prefix & No.: TSCI 1xx

Course Title: Wastewater Lagoon Systems EPA CD  
Credits: 1 credit

Required by: Water Quality – wastewater treatment certificate

Selective in:

Elective in:

General Education:

Lecture: XXX

Lecture/Lab:

Gradable Lab:

Contact hours lecture: 15 hours

Contact hours lab:

**Current Catalog Description (include all prerequisites):**

There is no current description.

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

Provide students with a basic knowledge of wastewater lagoon systems including: (1) the origins of wastewater lagoon treatment; (2) what constitutes wastewater; (3) management of a system; (4) rules and regulations governing operation of a system as well as sampling, testing and monitoring; (5) wastewater collection systems and lagoon structure; (6) the biological, chemical and natural physical treatment processes that occur in a system; (7) different types of lagoon systems, discharge options, disinfection choices, sludge removal options, and safety and security concerns and how all these issues pertain to operation and maintenance; (8) collecting wastewater lagoon samples for testing as well as the importance of monitoring influent and effluent flows and sludge accumulation; (9) basic information about common wastewater problems and offer guidance in identifying causes and solutions; and (10) math calculations common to wastewater treatment.





Students who successfully complete this course will:

- 1) Understand the characteristics and constituents of wastewater;
- 2) Have basic knowledge about federal, state and local wastewater regulations;
- 3) Recognize collection system and wastewater lagoon structure components;
- 4) Be familiar with wastewater influent and effluent flows and loads and sludge levels;
- 5) Understand the importance of cross-connection control and backflow prevention;
- 6) Understand the biological, chemical and natural physical treatment processes that occur in a wastewater lagoon system;
- 7) Recognize the importance microorganisms play in the treatment process;
- 8) Comprehend the basic operations of a wastewater lagoon system;
- 9) Be familiar with the proper maintenance required for a lagoon system;
- 10) Recognize the importance of facility security and safety as related to operation and maintenance;
- 11) Understand the importance of influent and effluent sample site locations, the types of samples that are collected and their purposes; and proper sample containers and how to label them;
- 12) Be familiar with wastewater lagoon problems, how to recognize the associated causes, and how to determine solutions to the problems; and
- 13) Be able to calculate math problems related to BOD, volume, area flow, dosage, pumping, detention time, loading, and TSS removal.

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

Computer to run training CD. Must have Windows XP or later.

Students who successfully complete this course will:

- (1) Understand the characteristics and constituents of wastewater
  - (2) Have basic knowledge about federal, state and local wastewater regulations
  - (3) Recognize collection system and wastewater treatment configurations
  - (4) Be familiar with wastewater influent and effluent flows and sludge levels
  - (5) Understand the importance of cross-connection control and backflow prevention
  - (6) Understand the biological, chemical and natural physical treatment processes that occur in a wastewater lagoon system
  - (7) Recognize the importance microorganisms play in the treatment process
  - (8) Comprehend the basic operations of a wastewater lagoon system
  - (9) Be familiar with the proper maintenance required for a lagoon system
  - (10) Recognize the importance of facility security and safety as related to operation and maintenance
  - (11) Understand the importance of influent and effluent sample collection, the types of samples that are collected and their purpose, and proper sample containers and how to use them
  - (12) Be familiar with wastewater lagoon problems, how to recognize the associated causes, and how to determine solutions to the problems, and
  - (13) Be able to calculate math problems related to BOD, volume, flow, design, pumping, detention time, loading, and TSS removal
- Additional instructional resources needed (including library materials, special equipment, and facilities). Please note approval does not indicate support for new facility or additional resources.

(Computer for run training CD. Must have Windows XP or later)

## COURSE REVISION FORM

NEW X DROPPED \_\_\_\_\_ MAJOR REVISION \_\_\_\_\_ FOR INFORMATION ONLY \_\_\_\_\_

College CEASN Program Area Water & Wastewater School Date \_\_\_\_\_

Submitter Carol A. Reifmeyer Dean Carol A. Reifmeyer Date 9-15-14  
Signature Signature (indicates "college" level approval)

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

This course is part of the proposed courses for the water quality certificate programs. It is designed to introduce students to current topics of importance to the field of water and wastewater.

### Please provide the following information:

College: CEASN  
Program Area: Water Quality  
Date: 10/22/12  
Course Prefix & No.: TSCI 2xx

Course Title: Water and Wastewater Schools

Credits: 2 credit

Required by: Water Quality – wastewater collection & wastewater treatment certificates

Selective in:

Elective in:

General Education:

Lecture: 30 hours

Lecture/Lab:

Gradable Lab:

Contact hours lecture: 30 hours

Contact hours lab:

Current Catalog Description (include all prerequisites):

There is no current description.

Proposed or New Catalog Description (include all prerequisites):

This course will introduce students to current topics of importance to the field of water and wastewater operations in addition to having the opportunity to review material in preparation for taking the State of Montana Certification examinations.

### Course Outcome Objectives:

Students who successfully complete this course will:

- 1) Understand the current topics in the field of water and wastewater;
- 2) Have basic knowledge about federal, state and local wastewater regulations;
- 3) Review topics required for successful completion of the state certification exams;
- 4) Be familiar with state and federal regulations that govern water and wastewater; and
- 5) Have basic knowledge of collection systems, distribution systems, treatment system utilized in the water and wastewater profession.

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



## COURSE REVISION FORM

NEW X DROPPED \_\_\_\_\_ MAJOR REVISION \_\_\_\_\_ FOR INFORMATION ONLY \_\_\_\_\_

College CEASN Program Area Backflow Prevention Date \_\_\_\_\_

Submitter Carol A. Rejzmead Dean Carol A. Rejzmead Date 9-15-14  
Signature Signature (indicates "college" level approval)

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

This course is part of the proposed courses for the water quality certificate programs. It is designed to introduce students to cross-connection control and backflow prevention and the testers that are used.

### Please provide the following information:

College: CEASN  
Program Area: Water Quality  
Date: 10/27/12  
Course Prefix & No.: TSCI 2xx  
  
Course Title: Backflow Prevention  
Credits: 3 credit

Required by: Water Quality – wastewater collection & wastewater treatment certificates

Selective in:

Elective in:

General Education:

Lecture:

Lecture/Lab: 60 hours

Gradable Lab:

Contact hours lecture: 30 hours

Contact hours lab: 30 hours

### Current Catalog Description (include all prerequisites):

There is no current description.

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

Provide students with a basic knowledge of understanding of field testing methods on 4 valves; pressure vacuum breakers, spill resistant vacuum breakers, reduced pressure principle assemblies, and double check assemblies. Students will gain knowledge in hydraulics, backflow and backsiphonage, types of cross connections, and degrees of hazard and state and federal regulations. Completion of this course and the written and practical exams will result in certification by ABPA as a backflow prevention assembly tester.

### Course Outcome Objectives:

Students who successfully complete this course will:

- 1) Understand the field testing methods on 4 valves;
- 2) Have basic knowledge about federal, state and local backflow regulations;
- 3) Have hands on experience with backflow testing assemblies;
- 4) Be familiar with connections, special application devices, and unapproved devices;
- 5) Understand the importance of cross-connection control and backflow prevention;
- 6) Be familiar with the maintenance and repair of devices.

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

## COURSE REVISION FORM

NEW X DROPPED \_\_\_\_\_ MAJOR REVISION \_\_\_\_\_ FOR INFORMATION ONLY \_\_\_\_\_

College CEASN Program Area Wastewater Collection Systems Date \_\_\_\_\_

Submitter Carol A. Reifner Dean Carol A. Reifner Date 9-15-14  
Signature Signature (indicates "college" level approval)

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

This course is part of the proposed courses for the water quality certificate programs. It is designed to introduce students to wastewater collection systems.

### Please provide the following information:

College: CEASN  
Program Area: Water Quality  
Date: 10/30/12  
Course Prefix & No.: TSCI 1xx

Course Title: Wastewater Collection Systems  
Credits: 3 credit

Required by: Water Quality – wastewater collection certificate

Selective in:

Elective in:

General Education:

Lecture: XXX

Lecture/Lab:

Gradable Lab:

Contact hours lecture: 45 hours

Contact hours lab:

### Current Catalog Description (include all prerequisites):

There is no current description.

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

Provide students with fundamental knowledge of (1) the importance and responsibilities of wastewater collection system operator; (2) the need for collection system operation and maintenance; (3) the components of and typical layouts of collection systems; (4) safety procedures for the construction, inspection and testing of sewers, inspection of manholes, and underground construction and repair; (5) rules and regulations related to treatment and discharge of wastewater; and (6) the Montana Department of Environmental Quality's operator certification requirements and exam process.

### Course Outcome Objectives:

Students who successfully complete this course will: (1) have a general understanding of the need for wastewater collection systems, the construction, testing, inspection, operation and maintenance of these systems; (2) understand what is required to become a certified wastewater collection operator; (3) gain an understanding of the local ordinances in regard to wastewater discharges; (4) understand the safety procedures that must be followed during construction, inspection, testing, operating and maintaining wastewater collection systems; and (5) have a general understanding of the use of close-circuit television, clearing stoppages, cleaning sewers, and controlling roots, grease, odors and corrosion in collection 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.**

Tour of a local facility.



## COURSE REVISION FORM

NEW X DROPPED \_\_\_\_\_ MAJOR REVISION \_\_\_\_\_ FOR INFORMATION ONLY \_\_\_\_\_

College CEASN Program Area Pumps & motors Operation & maintenance Date \_\_\_\_\_

Submitter Carol A. Reifmead Dean Carol A. Reifmead Date 9-15-14  
Signature Signature (indicates "college" level approval)

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

This course is part of the proposed courses for the water quality certificate programs. It is designed to introduce students to the types of pumps and motors commonly used in municipal water and wastewater systems.

### Please provide the following information:

College: CEASN  
Program Area: Water Quality  
Date: 10/22/12  
Course Prefix & No.: TSCI 1xx

Course Title: Pumps and Motors Operation and Maintenance  
Credits: 1 credit

Required by: Water Quality – water distribution certificate

Selective in:

Elective in:

General Education:

Lecture: XXX

Lecture/Lab:

Gradable Lab:

Contact hours lecture: 15 hours

Contact hours lab:

Current Catalog Description (include all prerequisites):

There is no current description.

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

Provide students with introductory concepts of pumps and motors used in the water and wastewater industry and general operation, maintenance and troubleshooting of each. Various types of pumps will be discussed including centrifugal, submersible, dose, screw and sludge pumps. Attention will also be given to hydraulic conditions and pump devices for the efficient use of pumps. Tours of the local water and wastewater systems will provide students the opportunity to see the pumps and motors in-line and operational.

### Course Outcome Objectives:

Students who successfully complete this course will:

- 1) Have a general understanding of the operation and application of centrifugal, submersible, dose, screw and sludge pumps & their associated motors and the appropriate applications for each within water and wastewater systems.
- 2) Have a general knowledge of variable frequency drives, booster systems, mechanical seals and lift stations.
- 3) Gain an understanding of the importance of the proper installation and care of pumps and motors.

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

Water and wastewater treatment facilities for tours to view pumps and motors in-line and operating.

# CEASN PROPOSAL TRACKING SHEET

(Document To Be Originated By CEASN Secretary)

1. Submit all proposals (using the appropriate Academic Senate program/degree and/or course revision forms) to the CEASN Administrative Assistant.
2. The CEASN Administrative Assistant forwards them to the appropriate CEASN Committee.

Proposal Number: <u>2014/2015 #6</u>	Title: <u>TSCI 1XX-Environmental Health + Safety for Water + Wastewater Personnel</u>
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Received by CEASN Administrative Assistant 8-7-14

Forwarded to CEASN College Meeting 8-20-14

Returned to CEASN Administrative Assistant 9-9-14

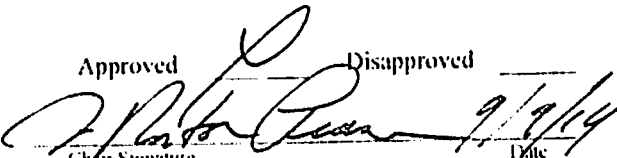
Forwarded to Dean for Signatures 9-15-14

Returned to CEASN Administrative Assistant 9-15-14

~~Forwarded to Professional Education Unit~~ \_\_\_\_\_

Returned to CEASN Administrative Assistant 9-15-14

Forwarded to ACAD Senate \_\_\_\_\_

Approved \_\_\_\_\_ Disapproved \_\_\_\_\_  
  
 Chair Signature \_\_\_\_\_ Date 9/9/14

  
 Dean Signature \_\_\_\_\_

Approved \_\_\_\_\_ Disapproved \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

# CEASN PROPOSAL TRACKING SHEET

(Document To Be Originated By CEASN Secretary)

1. Submit all proposals (using the appropriate Academic Senate program/degree and/or course revision forms) to the CEASN Administrative Assistant.
2. The CEASN Administrative Assistant forwards them to the appropriate CEASN Committee.

Proposal Number: <u>2014/2015 #13</u>	Title: <u>TSCI 2XX - Water + Wastewater Schools</u>
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Date

Received by CEASN Administrative Assistant

8-7-14

Forwarded to CEASN College Meeting

8-20-14

Approved \_\_\_\_\_

Disapproved \_\_\_\_\_

*[Signature]* 9/2/14  
Chair Signature Date

Returned to CEASN Administrative Assistant

9-9-14

Forwarded to Dean for Signatures

9-15-14

*Carol A. Repchner*  
Dean Signature

Returned to CEASN Administrative Assistant

9-15-14

~~Forwarded to Professional Education Unit~~

Approved \_\_\_\_\_

Disapproved \_\_\_\_\_

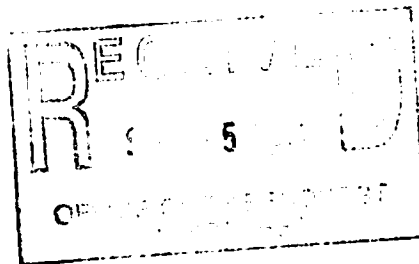
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Signature Date

Returned to CEASN Administrative Assistant

9-15-14

Forwarded to ACAD Senate

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# CEASN PROPOSAL TRACKING SHEET

(Document To Be Originated By CEASN Secretary)

1. Submit all proposals (using the appropriate Academic Senate program/degree and/or course revision forms) to the CEASN Administrative Assistant.
2. The CEASN Administrative Assistant forwards them to the appropriate CEASN Committee.

Proposal Number: <u>2014/2015 #9</u>	Title: <u>TSCI 1XX-Wastewater Lagoon Systems</u> <u>EPA CD</u>
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Date

Received by CEASN Administrative Assistant

8-7-14

Forwarded to CEASN College Meeting

8-20-14

Returned to CEASN Administrative Assistant

9-9-14

Forwarded to Dean for Signatures

9-15-14

Returned to CEASN Administrative Assistant

9-15-14

~~Forwarded to Professional Education Unit~~

\_\_\_\_\_

Approved \_\_\_\_\_

Disapproved \_\_\_\_\_

*[Signature]*  
Chair Signature 9/9/14  
Date

*[Signature]*  
Dean Signature

Approved \_\_\_\_\_

Disapproved \_\_\_\_\_

Returned to CEASN Administrative Assistant

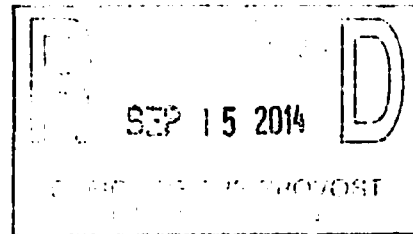
9-15-14

Forwarded to ACAD Senate

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\_\_\_\_\_  
Signature Date

Updated 02/18/11





## CEASN PROPOSAL TRACKING SHEET

(Document To Be Originated By CEASN Secretary)

1. Submit all proposals (using the appropriate Academic Senate program/degree and/or course revision forms) to the CEASN Administrative Assistant.
2. The CEASN Administrative Assistant forwards them to the appropriate CEASN Committee.

Proposal Number: <u>2014/2015 # 12</u>	Title: <u>TSCI 2XX - Backflow Prevention</u>
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	Date			
Received by CEASN Administrative Assistant	<u>8-7-14</u>			
Forwarded to CEASN College Meeting	<u>8-20-14</u>	Approved	Disapproved	
				
		Chair Signature	Date	
Returned to CEASN Administrative Assistant	<u>9-9-14</u>			
Forwarded to Dean for Signatures	<u>9-15-14</u>			
		Dean Signature		
Returned to CEASN Administrative Assistant	<u>9-15-14</u>			
<del>Forwarded to Professional Education Unit</del>	_____	Approved	Disapproved	
		Signature	Date	
Returned to CEASN Administrative Assistant	<u>9-15-14</u>			
Forwarded to ACAD Senate				

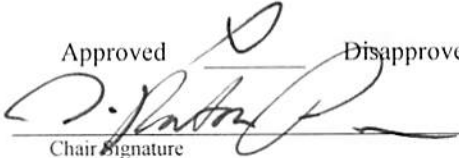
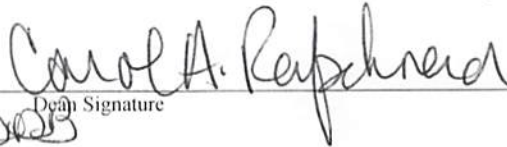




**CEASN PROPOSAL TRACKING SHEET**  
**(Document To Be Originated By CEASN Secretary)**

1. Submit all proposals (using the appropriate Academic Senate program/degree and/or course revision forms) to the CEASN Administrative Assistant.
2. The CEASN Administrative Assistant forwards them to the appropriate CEASN Committee.

Proposal Number: <u>2014/2015 # 11</u>	Title: <u>TSCI IXX - Wastewater Collection Systems</u>
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	Date				
Received by CEASN Administrative Assistant	<u>8-7-14</u>				
Forwarded to CEASN College Meeting	<u>8-20-14</u>		Approved <u>  </u>	Disapproved <u>  </u>	
				<u>7/9/14</u>	
			Chair Signature	Date	
Returned to CEASN Administrative Assistant	<u>9-9-14</u>				
Forwarded to Dean for Signatures	<u>9-15-14</u>				
			Dean Signature		
Returned to CEASN Administrative Assistant	<u>9-15-14</u>				
<del>Forwarded to Professional Education Unit</del>	<u>  </u>		Approved <u>  </u>	Disapproved <u>  </u>	
Returned to CEASN Administrative Assistant	<u>9-15-14</u>				
Forwarded to ACAD Senate			Signature	Date	



**CEASN PROPOSAL TRACKING SHEET**  
**(Document To Be Originated By CEASN Secretary)**

1. Submit all proposals (using the appropriate Academic Senate program/degree and/or course revision forms) to the CEASN Administrative Assistant.
2. The CEASN Administrative Assistant forwards them to the appropriate CEASN Committee.

Proposal Number: <u>2014/2015 #16</u>	Title: <u>TSCI 1XX - Pumps + Motors Operation + Maintenance</u>
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	Date		
Received by CEASN Administrative Assistant	<u>8-7-14</u>		
Forwarded to CEASN College Meeting	<u>8-20-14</u>	Approved _____	Disapproved _____
			<u>9/2/14</u>
		Chair Signature	Date
Returned to CEASN Administrative Assistant	<u>9-9-14</u>		
Forwarded to Dean for Signatures	<u>9-15-14</u>		
		Dean Signature	
Returned to CEASN Administrative Assistant	<u>9-15-14</u>		
 Forwarded to Professional Education Unit	_____	Approved _____	Disapproved _____
		Signature	Date
Returned to CEASN Administrative Assistant	<u>9-15-14</u>		
Forwarded to ACAD Senate			

