Faculty Senate Minutes
4/24/2020
1-2 pm
Virtual Meeting via Zoom

Present: Charie Faught (Chair), Stella Capoccia, Tamara Harp, Ryan Stapley, Susan Schrader, Bryan Kukay, Laura Young, Mary North-Abbott, Tony Patrick, Chris Gammons, Katherine Zodrow, Ulana Holtz, Phil Curtiss, Jackie Timmer, Ron White, Peter Lucon, Abhishek Choudhury, Dan Autenrieth, Miriam Young, Courtney Young, Vickie Petritz, Karen Wesenberg, Leslie Dickerson, Atish Mitra

Quorum@ 1:00pm

I. Welcome and Minutes (https://www.mtech.edu/facultystaff/facultysenate/minutes/index.html)

Approvals for April 10, 2020. Motion to approve, and seconded. **PASSED.**

Action Items

II. CRC Approvals
- a. Civil Engineering File
  - i. Revision of professional electives and curriculum in last semester. Passed and forward to Senate
- b. Cybersecurity File
  - i. Amend course in Cybersecurity: replace NTS 205 with CAPP 270. Passed and forward to Senate
- c. Cybersecurity File
  - i. CSCI 102 to replace PSYX 100 in program. Passed and forward to Senate
- d. Cybersecurity File
  - i. Addition of WRIT 121 and delete WRIT 101 as a requirement. Passed and forward to Senate
- e. Computer Science File
  - i. Amend co-requisites. Passed and forward to Senate
- f. Geoscience MS Option File
  - i. M.S. Geoscience-Hydrogeological Engineering Option. Passed and forward to Senate
- g. Hydrogeology Minor File
  - i. Modification of minor. Passed and forward to Senate
- h. Field Camp Modification: Geology and Hydrogeology File
  - i. Passed and forward to Senate
- i. GEOE 429 Syllabus File
  - i. Syllabus GEO 409 File
- j. GEOE 528 Contaminate Transport File
  - i. Changing the wording for the catalog description and the prerequisites for GEOE 528. Contaminant Transport to more accurately reflect material taught in this course. Passed and forward to Senate
- k. GEOE 520 Advanced Hydro geology File
  - i. Changing the wording of the catalog description for GEOE 520 Advanced hydro geology. Passed and forward to Senate
- l. Geophysics File
  - i. Amend curriculum: delete EGEN 194 add CHMY 144. PHSX 423 amendments, GEOP 475W amendments. Passed and forward to Senate
- m. Materials and Metals revision of Bachelors of Science File

    i. Proposal for revision of curriculum. Passed and forward to Senate

n. Detail file for Material and Metals Revision
o. Material and Metals pre req revision File
    i. EMET revision of prerequisites. Passed and forward to Senate.
p. Petroleum Eng prerequisite change PET 348 File
    i. Passed and forward to Senate
q. Petroleum Eng prerequisite change PET 426 File
    i. Passed and forward to Senate
    ii. Petroleum Eng Old Curriculum Worksheet File
    iii. 2019-2020 worksheet
    iv. Petroleum Eng New Curriculum worksheet File
    v. 2020-2021 worksheet
r. PET 207 File
    i. Create new course PET 207 Passed and forward to Senate
s. PET 302 File
    i. Amend prerequisites Passed and forward to Senate
t. PET Change order of classes File
    i. Proposed amendment to class sequence Passed and forward to Senate
u. PET 453 File
    i. Proposed name change Passed and forward to Senate
v. Mech Engineering File
    i. Amend professional electives in Bachelors Program Passed and forward to Senate
w. Mech Engineering File
    i. Request for change of course number EMEC4XX/5XX Impact Dynamics Passed and forward to Senate
x. Mech Engineering File
    i. Request for permanent course number EMEC 491 Product Development to be established as professional elective. Future possible development as a required course Passes and forward to Senate
y. Mech Engineering File
    i. Request for permanent course number for Rocket Propulsion. Passed and forward to Senate
z. Environmental Eng. EENV 444 File
    i. Change of pre-requisite to course EENV 444, remove existing prerequisite of EENV 443 and replace with EGEN 335 Fluid Mechanics. Dean approved via e mail. Passed and forward to Senate
aa. Environmental Eng. EENV 444 File
    i. Change of pre-requisite to course EENV 444, remove existing prerequisite of EENV 443 and replace with EGEN 335 Fluid Mechanics Dean approve via e mail. Passed an forward to Senate

Motion to approve, and seconded. **PASSED.**

Chair informed the senate that she is working with David Hood (Chair, CRC) to streamline the document transfer process from CRC to faculty senate, which should be available from next session.

Informational Items

III. Fall Enrollment and Registration

Leslie Dickerson presented: At the moment the application volume is similar to last year's (in-state application up, but out-of-state down). Transfer student application is down from last year's. The goal at present is to maximize yield. The virtual replacement to the Digger Con 2020 was successful – many applicants joined online and had questions. About 1200 applicants have been called to check whether they intend to come to Montana Tech in fall – have got both positive and negative responses. The secretaries of individual departments have access to the students who have already registered. At present, it is difficult to predict the actual numbers for the upcoming fall 2020 session. A more accurate count of fall enrollment is expected by June 1st. A group has been working with the consultants and a formal (10 point) plan has been developed for future enrollment drives – which will be discussed during the upcoming campus meeting on 5th May.

IV. Distance Learning Classes (schedule attached)

Chair: Online classes have been developed in consultation with the provost and the online content manager Llyod Curtis (see attached schedule). Discussion: It is not clear at the moment whether classes will have to meet online for fall 2020. Senators predicted a possibility of either online or a mix of online and face-to-face classes. We should be prepared for the possibility of online classes.

Discussion Items

V. Activities and priorities for the upcoming year

a. Faculty Satisfaction Survey

Chair and Co-Chair: The survey will be launched shortly, after some technical glitches are fixed. It will be ensured that the survey is anonymous.

b. Reminder- Faculty Senate Roster Updates

Chair reminded that the new senate representatives have to be finalized by the next meeting (1st May). Richard LaDouceur has been proposed as the adjunct faculty representative to the senate. Motion to accept Richard LaDouceur as the adjunct faculty representative, and seconded. **PASSED.**

VI. Other Items

a. Identifying "Super Users and Online Champions"

Chair: Proposal to identify individuals as "Super User" and "Online Champion", to serve as resources for other faculty. Charie Faught and Dan Autenrieth were identified.

b. Coronavirus Campus Discussion

Chair reminded senators to vote for the spring graduation list electronically.

c. Reminder- Last meeting of the year on May 1, 2020 from 1-2

Motion to adjourn @ 1:45pm, and seconded.

Moodle Training Courses

North Campus:

Basic online course setup and best practices.

Dates: 5/1, 5/8, 5/15

Time: 10:00 – 11:30AM

Room: SE 308

Building a secure quiz in Moodle.

Dates: 4/29, 5/06, 5/13

Time: 11:00 – 12:00PM

Room SE 308

Building student engagement in your online courses.

Dates: 5/8, 5/15

Time: 1:30 – 2:30PM

Room SE 308

Writing (or rewriting) a syllabus for online course delivery.

Dates: 5/08, 5/15

Time: 12:30 – 1:30PM

Room SE 308

Highlands College

Basic online course setup and best practices.

5/5, 5/12

Time: 10:30 – 12:00PM

Room HC 144

Building a secure quiz in Moodle.

5/5, 5/12

Time: 1:00 – 2:00PM

Room HC 144

Building student engagement in your online courses.

5/12

Time: 2:00 – 3:00PM

Room HC 144

Writing (or rewriting) a syllabus for online course delivery.

5/7, 5/14

Time: 11:00 – 12:00PM

Room HC 144

Montana Tech

Curriculum Change Request Form Dated 6 September 2018

Protocol: The department requesting a curriculum change holds a discussion at the departmental level, and if agreed upon, the Department Chair, elevates the request to the Dean for approval. All changed to the catalog require CRC approval.

Meetings are Thu, by COB Monday, forward the completed form along with supporting information to the CRC chair after approval from the department chair, dean, and graduate council if necessary. Please email a word file and remember to check the request level found on the signature page. The signature page can be a PDF or bring the original with signatures to the meeting and state in the email that you are doing so.

New courses require course objectives. Please contact the registrar before submitting a CRC request for a new course to evaluate the use of the common course numbering system. If numbers are pending, it is acceptable to use the XX notation. OSH 2XX

Final changes are made by the registrar after senate approval.

Guidance can be found: https://www.umt.edu/provost/faculty/curriculum/default.php.

MontanaTech *Curriculum Change Request Form Dated 6 September 2018*

Date 04/09/2019
Dept. Civil Engineering — **College** School of Mines and Engineering
Program Civil Engineering Program — **CRC Representative** Dr. Liping Jiang

Description of Request: Spring Semester Senior Year. Replace ECIV-402 (Sustainable Engineering-3 cr) in the catalog with EENVE460W (Energy and Sustainability-3 cr). EENVE 460W will continue to be taught by Environmental Engineering in the spring semesters.

Professional Electives will be revised to include Internship credit for 1, or, 2 credits, and 3 credits of professional elective offerings in the fall and spring semesters.

Current Course or Program Information:

Proposed Change

Course # Name	Credits	Pre-req.
~~ECIV 402 (Sustainable Engineering)~~	~~3~~	~~C.E. Major~~
EENV460W (Energy and Sustainability)	**3**	EENV 443, or, senior standing engineering major (for C.E.)

Changes to Professional Electives

- **Change from, "3 Professional Elective credits required. Approved professional Electives include: EENV 402 (Surface Water Hydrology 3 cr), OSH 324 (Construction Safety 3 cr), ECIV 487 (Soil Mechanics and Foundations lab 1 cr), or Internship (Must be of junior or senior standing, 1 cr., 1 time only). Additional courses that are offered by the Civil Engineering Department at the 300 level or higher may be used as a professional elective where not required elsewhere in the curriculum."**
- **Change to, "**3 Professional Elective Credits required. Approved professional electives include: EENVE 402 (Surface Water Hydrology-3 cr), OSH 324 (Construction Safety-3cr), ECIV 487 (Soil Mechanics and foundations Lab 1 cr), or Internship (Must be of junior or senior standing, 1 to 2 credits). Additional courses that are offered in the fall or spring semesters by the Geological Engineering and Civil Engineering Departments at the 300 level or higher, may also be used as a professional elective; where not required elsewhere in the curriculum (presuming that pre requisites and co-requisites are otherwise met).

This should include what will appear in the catalog, exactly. New course require course objectives listed in this area.

EENV 460W The course involves the principles of energy production, the technologies involved, and the resources required. The course analyzes the engineering principles, the energy policy, energy conversion technologies of traditional and renewable energy production. The sustainability aspect will discuss life cycle analysis of energy production and evaluate the methods to quantify environmental and community benefits in a more realistic manner. Pre-requite: EENV 443 or, senior standing engineering major (for C.E.).

List of supporting documentation included:

1. **Syllabus EENV 460W**
2. **Curriculum Work Sheet (CE Senior Year)**

EENV460W ENERGY & SUSTAINABILITY

Instructor: David Hutchins, Ph.D.

Designation: Required Environmental Engineering/Civil Engineering

Prerequisites: Senior standing in an engineering major or by instructor approval

Textbook: None. Lecture slides and reading assignments will be posted

Course Description: EENV460W Energy and Sustainability (3 Credits) The course involves the principles of energy production, the technologies involved, and the resources required. The course analyzes the engineering principles, the energy policy, energy conversion technologies of traditional and renewable energy production. The sustainability aspect will discuss life cycle analysis of energy production and evaluate the methods to quantify environmental and community benefits in a more realistic manner.

Course Objectives: The objective of this course is to develop a basic knowledge of sustainability in the context of energy and engineering design. Upon the completion of this course, the student should be able to:

- Understand and critically evaluate long-term energy considerations within engineering designs
- Understand the concept of sustainability and apply relevant metrics
- Understand the concepts, terminology, and calculations associated with renewable energy technologies

ABET Program Outcomes applicable to this course:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, culture, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

Topics Covered:

Energy, sustainability, and society
Fundamental sustainability considerations
Critical thinking and specific sustainability issues
Renewable energy technologies
LEED certification topics, including location and transportation, sustainable sites, water efficiency, energy and atmosphere, and materials and resources

Civil Engineering, B.S.

Senior

Fall Semester

Course Name	Credits	Term Taken	Grade	Gen Ed
ECIV 486 - Soil Mechanics & Foundation Design	*3 credits*			
ECIV 302 - Temporary Structures	*3 credits*			
ECIV 431 - Open Channel Hydraulics	*3 credits*			
ECIV 458 - F.E. Review for Civil Engineers	*1 credit*			
ECIV 489W - Civil Engineering Design I	*2 credits*			
Free Elective *3 credits*				

Total: 15

Spring Semester

Course Name	Credits	Term Taken	Grade	Gen Ed
ECIV 405 - Construction Project Planning and Scheduling (Or ECIV 505)	*3 credits*			
Social Science Elective *3 credits*				
ECIV 499W - Capstone: Civil Engineering Design II	*1 credit*			
ECIV 443 - Hydraulic Structures (Or ECIV 543)	*3 credits*			
~~ECIV 403 - Sustainable Engineering~~ EENV 460W	*3 credits*			
Professional Elective *3 credits**				

Total: 16

Minimum credits for a B.S. degree in Civil Engineering: 128

Notes:

* 3 Professional Elective credits required. Approved Professional Electives include: EENV 400 *Surface Water Hydrology* 3 cr., OSH 324 *Construction Safety* 3 cr., ECIV 487 *Soil Mechanics and Foundations Lab* 1 cr, or Internship (Must be of junior or senior standing, 1 cr., 1 time only.) Additional courses that are offered by the Civil Engineering department at the 300 level or higher may be used as a professional elective where not required elsewhere in the curriculum.

Notes:

REVISE TO READ AS:

*3 Professional Elective Credits required. Approved professional electives include: EENVE 402 (Surface Water Hydrology-3 cr), OSH 824 (Construction Safety-3cr), ECIV 487 (Soil Mechanics and foundations Lab 1 cr), or Internship (Must be of junior or senior standing, 1 to 2 credits). Additional courses that are offered in the fall or spring semesters by the Geological Engineering and Civil Engineering Departments at the 300 level or higher, may also be used as a professional elective where not required elsewhere in the curriculum-presuming that pre requisites and co-requisites are otherwise met.

Assessment Leading to Request

The assessment leading to the request is based on collaborations with other departments, student advising and course availability.

Anticipated Impacts to "Other" Programs

None are anticipated, other than for Civil Engineering, Environmental Engineering, and Geological Engineering.

Impact on Library: Brian Kukay has consulted with Sott Juskiewicz (04/7 20) at the Montana Tech library to ensure needed materials and media are available.

Date to take effect: August 26, 2020

MontanaTech *Curriculum Change Request Form Dated 6 September 2018*

APPROVALS

Department Head Approval _____ **Date** 4/7/20

Dean Approval Dan Trudnowski **Date** 4/9/2020

Graduate Council Approval David Hood Date 4/19/20

CRC Approval _____ Date _____

Faculty Senate Approval _____ Date _____

VCAA Approval (see below) _____ Date _____

Chancellor Approval (see below) _____ Date _____

LEVEL of Request

Please indicate the type of request(s) by selecting *all that apply*:

Faculty Approvals (directly to CRC, then Faculty Senate):

- ☐ Establish a new course for the catalog (please contact the Registrar of MUS CCN information)
- ☑ Changed course: addition, deletion or change of title, credit, course number, pre-req, description, or cross listing.
- ☑ Amend an existing degree program. Making changes to programs such as adding a writing course to a major, changing the list of accepted electives or removing a requirement of a minor
- ☐ New degree certification program of 29 credits or less
- ☐ Other:

Campus Approvals (must be approved by the VCAA prior to CRC submission):

- ☐ Placing a postsecondary educational program into moratorium
- ☐ Withdrawing a postsecondary educational program from moratorium
- ☐ Establishing, re-titling, terminating or revising a campus certificate of 29 credits or more
- ☐ Establishing a B.A.S./A.A./A.S. area of study
- ☐ Offering an existing postsecondary educational program via distance or online delivery
- ☐ Other:

OCHE Approvals *(must be approved by the VCAA and Chancellor prior to CRC submission)*:

- ☐ Re-titling an existing postsecondary educational program
- ☐ Terminating an existing postsecondary educational program
- ☐ Consolidating existing postsecondary educational programs
- ☐ Establishing a new minor where there is a major or an option in a major
- ☐ Revising a postsecondary educational program
- ☐ Establishing a temporary C.A.S. or A.A.S. degree program Approval limited to 2 years
- ☐ Other:

Level II *(must be approved by the VCAA and Chancellor prior to CRC submission)*:

- ☐ Establishing a new postsecondary educational program
- ☐ Exceeding the 120 credit maximum for baccalaureate degrees Exception to policy 301.11
- ☐ Forming, eliminating or consolidating an academic, administrative, or research unit
- ☐ Re-titling an academic, administrative, or research unit
- ☐ Other:

MontanaTech *Curriculum Change Request Form Dated 2 Feb 2017*

Protocol: The department requesting curriculum change holds a discussion at the departmental level, and if agreed upon by the department head, discuss with the Dean for approval. Forward the completed form along with supporting information to the CRC chair after approval from the department head, dean, and graduate council if necessary. Final changes are then made by the registrar after faculty senate approval. Guidance: https://www.umt.edu/provost/faculty/curriculum/default.php.

Date 04/08/2020
Dept. Computer Science **College** SME
Program: Software Engineering
Description of Request/Summary: Change the co-requisite of ESOF 486 from "COMX 338 and ESOF 427" to "(COMX 338 OR CSCI 443) and ESOF 427.

Current Course Program Information: Co-requisite is currently listed as COMX 338 and ESOF 427.

Proposed Change (Attach syllabus or curriculum for new course or curriculum changes.)

Course # Name	Credits	Pre-req.
ESOF 486 Senior Design Project I	**2**	**ESOF 328** **Co-req: (COMX 338 or CSCI 443) and ESOF 427**

This two semester sequence is the capstone course for a Software Engineering degree. Students will work in teams of two to five under the direction of a mentor to either develop or re-engineer a complex software product. Each team will go through all of the steps of a software development process. Each team will develop a Software Requirements Specification, a Software Development Plan, a Software Design Description, and a Software Test Plan/Report and any other documents required for their product. Each team will prepare a campus presentation on their project.

Prerequisite(s): ESOF 328 **Corequisite(s):** COMX 338 and ESOF 427 Course generally offered first semester.

List of supporting documentation attached:

1. N/A

Assessment Leading to Request

Software Engineering students have always been required to take a course in user interface design. When the PTC department began offering the COMX 338, Usability Testing, course, we required students to take that course, instead of offering a course of our own. Now that PTC is no longer offering that course, we need to offer CSCI 443 User Interface Design through our department again. (This course, CSCI 443, is already on the books, and no changes will be made to it – we just need to change the co-requisite for ESOF 486.)

Anticipated Impacts to "Other" Programs

None.

Impact on Library: No consultation is required since changes are only in the course number, course name, or course pre-requisites.

Date to take effect: Immediately upon approval.

LEVEL of Request

Please indicate the type of request(s) by selecting *all that apply*:

Faculty Approvals (directly to CRC, then Faculty Senate):

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- ☐ Amend an existing degree program. Making changes to programs such as adding a writing course to a major, changing the list of accepted electives or removing a requirement of a minor
- ☐ New degree certification of 29 credits or less
- ☐ Other:

Campus Approvals (must be approved by the VCAA prior to CRC submission):

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- ☐ Withdrawing a postsecondary educational program from moratorium
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- ☐ Establishing a B.A.S./A.A./A.S. area of study
- ☐ Offering an existing postsecondary educational program via distance or online delivery
- ☐ Other:

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- ☐ Re-titling an academic, administrative, or research unit
- ☐ Other:

APPROVALS

Department Head Approval ___**Michele Van Dyne**_____ **Date** _**4/8/20**__

Dean Approval Dan Trudnowski **Date** 4/8/2020

VCAAR Approval (see above) David Hood Date 4/19/20

Chancellor Approval (see above) _____ Date _____

Graduate Council Approval _____ Date _____

CRC Approval _____ Date _____

Faculty Senate Approval _____ Date _____

MontanaTech *Curriculum Change Request Form Dated 2 Feb 2017*

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Date 04/08/2020
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Program: Software Engineering
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Current Course Program Information: Co-requisite is currently listed as COMX 338 and ESOF 427.

Proposed Change (Attach syllabus or curriculum for new course or curriculum changes.)

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Prerequisite(s): ESOF 328 **Corequisite(s):** COMX 338 and ESOF 427 Course generally offered first semester.

List of supporting documentation attached:

1. N/A

Assessment Leading to Request

Software Engineering students have always been required to take a course in user interface design. When the PTC department began offering the COMX 338, Usability Testing, course, we required students to take that course, instead of offering a course of our own. Now that PTC is no longer offering that course, we need to offer CSCI 443 User Interface Design through our department again. (This course, CSCI 443, is already on the books, and no changes will be made to it – we just need to change the co-requisite for ESOF 486.)

Anticipated Impacts to "Other" Programs

None.

Impact on Library: No consultation is required since changes are only in the course number, course name, or course pre-requisites.

Date to take effect: Immediately upon approval.

LEVEL of Request

Please indicate the type of request(s) by selecting *all that apply*:

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- ☐ Other:

APPROVALS

Department Head Approval ___**Michele Van Dyne**_____ **Date** _**4/8/20**__

Dean Approval Dan Trudnowski **Date** 4/8/2020

VCAAR Approval (see above) David Hood Date 4/19/20

Chancellor Approval (see above) _____ Date _____

Graduate Council Approval _____ Date _____

CRC Approval _____ Date _____

Faculty Senate Approval _____ Date _____

MontanaTech *Curriculum Change Request Form Dated 6 September 2019*

Date 03/11/2020
Dept. IT
College Highlands
Program Computer Networks & Cybersecurity
CRC Representative Ed Metesh

Description of Request: Replace WRIT 101 College Writing with WRIT 121 Intro.to Technical Writing

Current Course or Program Information:

Proposed Change

Course # Name	Credits	Pre-req.
WRIT 121 Intro. To Technical Writing	3	Passing score on placement test, WRIT 100, or consent of the Director of Writing.

Atkinson, Dawn
Thu 4/16/2020 11:18 AM
Dear David,

I hope this message finds you well.

I'm afraid that I won't be able to attend the CRC Zoom meeting on April 17 due to other commitments. Regardless, I have looked through all the CRC materials up for decision at the meeting. For the "Cybersecurity File" item, Ed Metesh is recommending adding WRIT 121 and deleting WRIT 101 as a requirement. Instead, I suggest that the requirement be "WRIT 121 (preferred) or WRIT 101" so there's some flexibility on the curriculum sheet. My rationale is this: if a WRIT 121 section at Highlands doesn't fill and has to be cancelled, then students can still move into a WRIT 101 section without a problem. The "WRIT 121 (preferred) or WRIT 101" language aligns with what the engineering departments have done on their curriculum sheets.

Thanks for all you have done this year with the CRC. Hopefully we will be back to face-to-face meetings in the near future.

Kind regards,
Dawn

List of supporting documentation attached:

1. **Curriculum worksheet**

Assessment Leading to Request
WRIT 121 presents more needed skills for students

Anticipated Impacts to "Other" Programs

Impact on Library: No consultation is required since

Date to take effect: 8/1/2020

MontanaTech *Curriculum Change Request Form Dated 6 September 2019*

APPROVALS

Department Head Approval _____ **Date** 3/11/2020

Dean Approval _____ **Date** 3/13/20

Graduate Council Approval David Hood **Date** 4/19/20

CRC Approval _____ **Date** _____

Faculty Senate Approval _____ **Date** _____

VCAA Approval (see below) _____ **Date** _____

Chancellor Approval (see below) _____ **Date** _____

LEVEL of Request

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- ☐ Establishing, re-titling, terminating or revising a campus certificate of 29 credits or more
- ☐ Establishing a B.A.S./A.A./A.S. area of study
- ☐ Offering an existing postsecondary educational program via distance or online delivery
- ☐ Other:

OCHE Approvals *(must be approved by the VCAA and Chancellor prior to CRC submission)*:

- ☐ Re-titling an existing postsecondary educational program
- ☐ Terminating an existing postsecondary educational program
- ☐ Consolidating existing postsecondary educational programs
- ☐ Establishing a new minor where there is a major or an option in a major
- ☐ Revising a postsecondary educational program
- ☐ Establishing a temporary C.A.S. or A.A.S. degree program Approval limited to 2 years
- ☐ Other:

Level II *(must be approved by the VCAA and Chancellor prior to CRC submission)*:

- ☐ Establishing a new postsecondary educational program
- ☐ Exceeding the 120 credit maximum for baccalaureate degrees Exception to policy 301.11
- ☐ Forming, eliminating or consolidating an academic, administrative, or research unit
- ☐ Re-titling an academic, administrative, or research unit
- ☐ Other:

MontanaTech *Curriculum Change Request Form Dated 6 September 2019*

Associate of Applied Science Degree – Computer Networks & Cybersecurity

Course No.	Course Title	Credits	Course No.	Course Title	Credits
			FRESHMAN		
	Fall			**Spring**	
ITS 130	Cybersecurity Essentials	3	ITS 210	Network Operating Systems - Desktop	3
NTS 104	CCNA 1 – Introduction to Networks	4	NTS 204	CCNA 3 – Scaling Networks	3
NTS 105	CCNA 2 – Routing & Switching	4	NTS 205	CCNA 4 – Connecting Networks	3
ITS 280	Computer Repair & Maintenance	3	ITS 224	Introduction to Linux	3
CSCI 116	Introduction to Python Programming	3	M 121	College Algebra	3
	Total	**17**		**Total**	**15**
			SOPHOMORE		
	Fall			**Spring**	
	Web Elective*	3	ITS 354	Advanced Linux	3
WRIT 121	**Intro. To Technical Writing**	**3**	ITS 220	Fundamentals of Wireless LANs	3
ITS 238	Network Security Fundamentals	3	ITS 214	Network Oper. Systems - Infrastructure	3
ITS 212	Network Operating Systems – Server Admin.	3	COMX 230 COMX 111	Presenting Technical Information OR Principles of Speaking	3 3
PSYX 100	General Psychology	3	ITS 274	Ethical Hacking & Network Defense	3
				Total	**15**
	Total	**15**		**AAS Total**	**62**

MontanaTech *Curriculum Change Request Form Dated 6 September 2019*

Date 03/11/2020
Dept. IT
Program Computer Networks & Cybersecurity

College Highlands
CRC Representative Ed Metesh

Description of Request: Replace NTS 205 CCNA 4 with CAPP 270 Introduction to Oracle

Current Course or Program Information:

Proposed Change

Course # Name	Credits	Pre-req.
CAPP 270 Introduction to Oracle	3	

List of supporting documentation attached:

1. Curriculum worksheet

Assessment Leading to Request

The CCNA track of four courses is being reduced to a series of three. Intro to Oracle, an existing class, will be become a good pre-req. for ITS 305 Web Server Administration.

Anticipated Impacts to "Other" Programs

Impact on Library: No consultation is required since CAPP 270 already exists)

Date to take effect: 8/1/2020

MontanaTech *Curriculum Change Request Form Dated 6 September 2019*

APPROVALS

Department Head Approval _____ **Date** 3/11/2020

Dean Approval _____ **Date** 3/13/20

Graduate Council Approval David Hood **Date** 4/19/20

CRC Approval _____ **Date** _____

Faculty Senate Approval _____ **Date** _____

VCAA Approval (see below) _____ **Date** _____

Chancellor Approval (see below) _____ **Date** _____

LEVEL of Request

Please indicate the type of request(s) by selecting *all that apply*:

Faculty Approvals (directly to CRC, then Faculty Senate):

- ☐ Establish a new course for the catalog (please contact the Registrar of MUS CCN information)
- ☐ Changed course: addition, deletion or change of title, credit, course number, pre-req, description, or cross listing.
- X Amend an existing degree program. Making changes to programs such as adding a writing course to a major, changing the list of accepted electives or removing a requirement of a minor
- ☐ New degree certification program of 29 credits or less
- ☐ Other:

Campus Approvals (must be approved by the VCAA prior to CRC submission):

- ☐ Placing a postsecondary educational program into moratorium
- ☐ Withdrawing a postsecondary educational program from moratorium
- ☐ Establishing, re-titling, terminating or revising a campus certificate of 29 credits or more
- ☐ Establishing a B.A.S./A.A./A.S. area of study
- ☐ Offering an existing postsecondary educational program via distance or online delivery
- ☐ Other:

OCHE Approvals *(must be approved by the VCAA and Chancellor prior to CRC submission)*:

- ☐ Re-titling an existing postsecondary educational program
- ☐ Terminating an existing postsecondary educational program
- ☐ Consolidating existing postsecondary educational programs
- ☐ Establishing a new minor where there is a major or an option in a major
- ☐ Revising a postsecondary educational program
- ☐ Establishing a temporary C.A.S. or A.A.S. degree program Approval limited to 2 years
- ☐ Other:

Level II *(must be approved by the VCAA and Chancellor prior to CRC submission)*:

- ☐ Establishing a new postsecondary educational program
- ☐ Exceeding the 120 credit maximum for baccalaureate degrees Exception to policy 301.11
- ☐ Forming, eliminating or consolidating an academic, administrative, or research unit
- ☐ Re-titling an academic, administrative, or research unit
- ☐ Other:

MontanaTech *Curriculum Change Request Form Dated 6 September 2019*

Associate of Applied Science Degree – Computer Networks & Cybersecurity

FRESHMAN

Course No.	Course Title	Credits
Fall		
ITS 130	Cybersecurity Essentials	3
NTS 104	CCNA 1 – Introduction to Networks	4
NTS 105	CCNA 2 – Routing & Switching	4
ITS 280	Computer Repair & Maintenance	3
CSCI 116	Introduction to Python Programming	3
	Total	**17**

Course No.	Course Title	Credits
Spring		
ITS 210	Network Operating Systems - Desktop	3
NTS 204	CCNA 3 – Scaling Networks	3
CAPP 270	**Introduction to Oracle**	3
ITS 224	Introduction to Linux	3
M 121	College Algebra	3
	Total	**15**

SOPHOMORE

Fall		
	Web Elective*	3
WRIT 121	Intro. to Technical Writing	3
ITS 238	Network Security Fundamentals	3
ITS 212	Network Operating Systems – Server Admin.	3
PSYX 100	General Psychology	3
	Total	**15**

Spring		
ITS 354	Advanced Linux	3
ITS 220	Fundamentals of Wireless LANs	3
ITS 214	Network Oper. Systems - Infrastructure	3
COMX 230	Presenting Technical Information OR	3
COMX 111	Principles of Speaking	3
ITS 274	Ethical Hacking & Network Defense	3
	Total	**15**
	AAS Total	**62**

MontanaTech *Curriculum Change Request Form Dated 6 September 2019*

Date 03/11/2020
Dept. IT
Program Computer Networks & Cybersecurity

College Highlands
CRC Representative Ed Metesh

Description of Request: Replace PSYX 100 General Psychology with CSCI 102 Computational Thinking w/lab

Current Course or Program Information:

Proposed Change

Course # Name	Credits	Pre-req.
CSCI 102 Computational Thinking w/lab	3	

List of supporting documentation attached:

1. Curriculum worksheet

Assessment Leading to Request

The problem solving skills introduced in this class will be great tools for the many intended/not-intended troubleshooting scenarios in so many of our hands-on classes.

Anticipated Impacts to "Other" Programs

Impact on Library: No consultation is required since CSCI 102 already exists)

Date to take effect: 8/1/2020

MontanaTech *Curriculum Change Request Form Dated 6 September 2019*

APPROVALS

Department Head Approval _____ **Date** 3/16/2020

Dean Approval _____ **Date** 3/17/20

Graduate Council Approval David Hood **Date** 4/19/20

CRC Approval _____ **Date** _____

Faculty Senate Approval _____ **Date** _____

VCAA Approval (see below) _____ **Date** _____

Chancellor Approval (see below) _____ **Date** _____

LEVEL of Request

Please indicate the type of request(s) by selecting *all that apply*:

Faculty Approvals (directly to CRC, then Faculty Senate):

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- ☐ New degree certification program of 29 credits or less
- ☐ Other:

Campus Approvals (must be approved by the VCAA prior to CRC submission):

- ☐ Placing a postsecondary educational program into moratorium
- ☐ Withdrawing a postsecondary educational program from moratorium
- ☐ Establishing, re-titling, terminating or revising a campus certificate of 29 credits or more
- ☐ Establishing a B.A.S./A.A./A.S. area of study
- ☐ Offering an existing postsecondary educational program via distance or online delivery
- ☐ Other:

OCHE Approvals *(must be approved by the VCAA and Chancellor prior to CRC submission)*:

- ☐ Re-titling an existing postsecondary educational program
- ☐ Terminating an existing postsecondary educational program
- ☐ Consolidating existing postsecondary educational programs
- ☐ Establishing a new minor where there is a major or an option in a major
- ☐ Revising a postsecondary educational program
- ☐ Establishing a temporary C.A.S. or A.A.S. degree program Approval limited to 2 years
- ☐ Other:

Level II *(must be approved by the VCAA and Chancellor prior to CRC submission)*:

- ☐ Establishing a new postsecondary educational program
- ☐ Exceeding the 120 credit maximum for baccalaureate degrees Exception to policy 301.11
- ☐ Forming, eliminating or consolidating an academic, administrative, or research unit
- ☐ Re-titling an academic, administrative, or research unit
- ☐ Other:

MontanaTech *Curriculum Change Request Form Dated 6 September 2019*

Associate of Applied Science Degree – Computer Networks & Cybersecurity

FRESHMAN

Fall

Course No.	Course Title	Credits
ITS 130	Cybersecurity Essentials	3
NTS 104	CCNA 1 – Introduction to Networks	4
NTS 105	CCNA 2 – Routing & Switching	4
ITS 280	Computer Repair & Maintenance	3
CSCI 116	Introduction to Python Programming	3
	Total	**17**

Spring

Course No.	Course Title	Credits
ITS 210	Network Operating Systems - Desktop	3
NTS 204	CCNA 3 – Scaling Networks	3
CAPP 270	Introduction to Oracle	3
ITS 224	Introduction to Linux	3
M 121	College Algebra	3
	Total	**15**

SOPHOMORE

Fall

Course No.	Course Title	Credits
	Web Elective*	3
WRIT 121	Intro. to Technical Writing	3
ITS 238	Network Security Fundamentals	3
ITS 212	Network Operating Systems – Server Admin.	3
CSCI 102	**Computational Thinking w/lab**	3
	Total	**15**

Spring

Course No.	Course Title	Credits
ITS 354	Advanced Linux	3
ITS 220	Fundamentals of Wireless LANs	3
ITS 214	Network Oper. Systems - Infrastructure	3
COMX 230	Presenting Technical Information OR	3
COMX 111	Principles of Speaking	3
ITS 274	Ethical Hacking & Network Defense	3
	Total	**15**
	AAS Total	**62**

Montana Tech *Curriculum Change Request Form Dated 6 September 2019*

Protocol: The department requesting a curriculum change holds a discussion at the departmental level, and if agreed upon, the Department Chair, elevates the request to the Dean for approval. All changes to the catalog require CRC approval.

Meetings are Thu, by COB Monday, forward the completed form along with supporting information to the CRC chair after approval from the department chair, dean, and graduate council if necessary. Please email a word file and remember to check the request level found on the signature page. The signature page can be a PDF or bring the original with signatures to the meeting and state in the email that you are doing so.

New courses require course outcomes. Please contact the registrar before submitting a CRC request for a new course to evaluate the use of the common course numbering system. If numbers are pending, it is acceptable to use the XX notation (i.e. OSH 2XX).

Final changes are made by the registrar after senate approval.

Guidance can be found: https://www.umt.edu/provost/faculty/curriculum/default.php.

MontanaTech *Curriculum Change Request Form Dated 6 September 2019*

Date 04/16/2020
Dept. ENVE ENGINEERING **College** SME
Program Environmental Engineering **CRC Representative** Dr. Raja Nagisetty

Description of Request: Change of pre-requisite to course EENV 444, remove existing prerequisite of EENV 443 and replace with EGEN 335 Fluid Mechanics

Current Course or Program Information: EENV 444 - Air Pollution Control II
3 credits (Hrs: 3 Lec.)
Applies current technology to solving gaseous air pollution problems. Equipment discussions include design, installation and operation of incinerators, adsorption systems, NOx control systems, packed towers, SOx control systems and ventilation systems.

Prerequisite(s): EENV 443. Course generally offered 1st semester

Proposed Change

Course # Name	**Credits**	**Pre-req.**

EENV 444 - Air Pollution Control II
3 credits (Hrs: 3 Lec.)
Applies current technology to solving gaseous air pollution problems. Equipment discussions include design, installation and operation of incinerators, adsorption systems, NOx control systems, packed towers, SOx control systems and ventilation systems.

Prerequisite(s): EGEN 335. Course generally offered in the first semester

This should include what will appear in the catalog, exactly. New course require course outcomes listed in this area.

List of supporting documentation attached: as above

1. **Example: Syllabus**
2. **Example: Curriculum worksheet**

Assessment Leading to Request
No changes

Anticipated Impacts to "Other" Programs
None

Impact on Library: No Changes (Or No consultation is required since changes are only in the course number, course name, or course pre-requisites.)

Date to take effect: 05/15/20

MontanaTech *Curriculum Change Request Form Dated 6 September 2019*

APPROVALS

Department Head Approval **_Kumar ganesan___(signed)_____ Date 04/16/2020_____**

Dean Approval **_____ Date _____**

Graduate Council Approval _____ Date _____

CRC Approval ___David Hood _____ Date __4/20/20_____

Faculty Senate Approval _____ Date _____

VCAA Approval (see below) _____ Date _____

Chancellor Approval (see below) _____ Date _____

LEVEL of Request

Please indicate the type of request(s) by selecting *all that apply*:

Faculty Approvals (directly to CRC, then Faculty Senate):

- ☐ Establish a new course for the catalog (please contact the Registrar of MUS CCN information)
- ☐ **Changed course: addition, deletion or change of title, credit, course number, pre-req, description, or cross listing.**
- ☐ Amend an existing degree program. Making changes to programs such as adding a writing course to a major, changing the list of accepted electives or removing a requirement of a minor
- ☐ New degree certification program of 29 credits or less
- ☐ Other:

Campus Approvals (must be approved by the VCAA prior to CRC submission):

- ☐ Placing a postsecondary educational program into moratorium
- ☐ Withdrawing a postsecondary educational program from moratorium
- ☐ Establishing, re-titling, terminating or revising a campus certificate of 29 credits or more
- ☐ Establishing a B.A.S./A.A./A.S. area of study
- ☐ Offering an existing postsecondary educational program via distance or online delivery
- ☐ Other:

OCHE Approvals *(must be approved by the VCAA and Chancellor prior to CRC submission)*:

- ☐ Re-titling an existing postsecondary educational program
- ☐ Terminating an existing postsecondary educational program
- ☐ Consolidating existing postsecondary educational programs
- ☐ Establishing a new minor where there is a major or an option in a major
- ☐ Revising a postsecondary educational program
- ☐ Establishing a temporary C.A.S. or A.A.S. degree program Approval limited to 2 years
- ☐ Other:

Level II *(must be approved by the VCAA and Chancellor prior to CRC submission)*:

- ☐ Establishing a new postsecondary educational program
- ☐ Exceeding the 120 credit maximum for baccalaureate degrees Exception to policy 301.11
- ☐ Forming, eliminating or consolidating an academic, administrative, or research unit
- ☐ Re-titling an academic, administrative, or research unit
- ☐ Other:

Montana Tech *Curriculum Change Request Form Dated 6 September 2019*

Protocol: The department requesting a curriculum change holds a discussion at the departmental level, and if agreed upon, the Department Chair, elevates the request to the Dean for approval. All changes to the catalog require CRC approval.

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New courses require course outcomes. Please contact the registrar before submitting a CRC request for a new course to evaluate the use of the common course numbering system. If numbers are pending, it is acceptable to use the XX notation (i.e. OSH 2XX).

Final changes are made by the registrar after senate approval.

Guidance can be found: https://www.umt.edu/provost/faculty/curriculum/default.php.

MontanaTech *Curriculum Change Request Form Dated 6 September 2019*

Date 04/16/2020
Dept. ENVE ENGINEERING **College** SME
Program Environmental Engineering **CRC Representative** Dr. Raja Nagisetty

Description of Request: Change of pre-requisite to course EENV 444, remove existing prerequisite of EENV 443 and replace with EGEN 335 Fluid Mechanics

Current Course or Program Information: EENV 204 Environmental process Engineering
EENV 204 - Environmental Process Engineering
3 credits (Hrs: 3 Lec.)
The basic engineering principles important to Environmental Engineering including, mass balance, and heat balance are taught.

Prerequisite(s): CHMY 143; M 171; PHSX 234. Course generally offered both semesters.

Proposed Change

Course # Name	Credits	Pre-req.

EENV 204 - Environmental Process Engineering
3 credits (Hrs: 3 Lec.)
The basic engineering principles important to Environmental Engineering including, mass balance, and heat balance are taught.

Prerequisite(s): CHMY 143 concurrent; M 171; PHSX 234. Course generally offered first semesters.

This should include what will appear in the catalog, exactly. New course require course outcomes listed in this area.

List of supporting documentation attached: as above

1. **Example: Syllabus**
2. **Example: Curriculum worksheet**

Assessment Leading to Request
No changes

Anticipated Impacts to "Other" Programs
None

Impact on Library: No Changes (Or No consultation is required since changes are only in the course number, course name, or course pre-requisites.)

Date to take effect: 05/15/20

MontanaTech *Curriculum Change Request Form Dated 6 September 2019*

APPROVALS

Department Head Approval **_Kumar Ganesan___(signed)_____ Date 04/16/2020_____**

Dean Approval **_____ Date _____**

Graduate Council Approval _____ Date _____

CRC Approval _David Hood _____ Date __4/20/20_____

Faculty Senate Approval _____ Date _____

VCAA Approval (see below) _____ Date _____

Chancellor Approval (see below) _____ Date _____

LEVEL of Request

Please indicate the type of request(s) by selecting *all that apply*:

Faculty Approvals (directly to CRC, then Faculty Senate):

- ☐ Establish a new course for the catalog (please contact the Registrar of MUS CCN information)
- ☐ **Changed course: addition, deletion or change of title, credit, course number, pre-req, description, or cross listing.**
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- ☐ New degree certification program of 29 credits or less
- ☐ Other:

Campus Approvals (must be approved by the VCAA prior to CRC submission):

- ☐ Placing a postsecondary educational program into moratorium
- ☐ Withdrawing a postsecondary educational program from moratorium
- ☐ Establishing, re-titling, terminating or revising a campus certificate of 29 credits or more
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- ☐ Offering an existing postsecondary educational program via distance or online delivery
- ☐ Other:

OCHE Approvals *(must be approved by the VCAA and Chancellor prior to CRC submission)*:

- ☐ Re-titling an existing postsecondary educational program
- ☐ Terminating an existing postsecondary educational program
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- ☐ Establishing a temporary C.A.S. or A.A.S. degree program Approval limited to 2 years
- ☐ Other:

Level II *(must be approved by the VCAA and Chancellor prior to CRC submission)*:

- ☐ Establishing a new postsecondary educational program
- ☐ Exceeding the 120 credit maximum for baccalaureate degrees Exception to policy 301.11
- ☐ Forming, eliminating or consolidating an academic, administrative, or research unit
- ☐ Re-titling an academic, administrative, or research unit
- ☐ Other:

MontanaTech *Curriculum Change Request Form Dated 6 September 2019*

Date 04/04/20
Dept. Geological Engineering **College** SME
Program B.S. Geological Engineering **CRC Representative** Larry Smith

Description of Request: Change in summer field camp class; replace 6-week, 6 credit, Field Geology and Geophysics class with four 2-week modules, but only two are required for undergraduate students. We plan to have the following 1-4 week modules (commonly 2 weeks each, but not necessarily always):

a) Field Geology (1-4 cr) – required for all students
b) Field Hydrogeology (1-4 cr – currently taught in August as a 2 cr class, but will be taught in May or June)

Current Course or Program Information:

Currently, all students must take a 6 cr summer field class, GEOE 409 Field Geology and Geophysics, taught in cooperation with the Geophysical Engineering Department, and containing 3 weeks of geology and 3 weeks of geophysics content. Additionally, our students choosing the Hydrogeology option must take an additional 2 cr summer class, GEOE 429 Field Hydrogeology.

Proposed Change:
All students would be required to take 4 cr of summer field classes, including at least one week of the Field Geology module, which we expect would be offered every year. We expect that most modules would be 2 cr, and run for 2 weeks. However, the variable credits in each of the modules allows for flexibility in designing and offering the classes each summer due to faculty and project availability. We expect that the Field Hydrogeology and Field Geotechnical Engineering (to be proposed later) modules would likely be offered on demand, possibly in alternate years. We expect either two or three modules would be offered each summer. Therefore, students would be able to take them in one or two summers, depending on satisfying each module's pre-requisites. Shortening the time commitment for the students will help them to obtain internships each summer. We expect some students may take three modules depending on their interests, their availability, and their needs to fill technical electives.

Additionally, we expect that some or all of these modules may be attractive to students from other universities, many of which have dropped their summer field classes, but expect their students to take them from other universities. Out-of-state students commonly ask us whether we would accept them, but typically, the students do not have the background for the geophysics portion of the class, so have been unable to take our 6-week course.

Summary of modules:

Course # Name		Credits	Pre-req.
Field Geology GEO 4XX	<new course>	1-4	GEO 209 and GEOE 403
Field Hydrogeology GEOE 429		1-4	Hydrogeology for Engineers GEOE 420

Course # Name	Credits	Pre-req.
Field Geology GEO 409	1-4 Lab	GEO 209 and GEOE 403

This capstone field course instructs students to apply field geological techniques to produce geological maps, cross sections, and other data. Students will study a range of rock types and structural deformation styles. Extensive hiking and outdoor physical challenges require that students be physically fit. A fee for supplies, transportation, and other logistical expenses is required. The time in the field will be devoted to geological studies.

Course Outcomes: Graduates of the Field Geology portion of this class will be able to:

1. Locate themselves on topographic maps and aerial photographs using a pocket transit compass and/or a hand-held GPS.
2. Describe rock types in the field and collect orientation data on strike-and-dip of bedding, axial plane, and plunge of folds, metamorphic foliations, joints, and faults.
3. Construct detailed geologic maps and cross-sections in complexly folded and faulted terrain, in areas with economic resources, and/or in areas with geologic hazards.
4. Apply field geology information to mineral resource assessment, slope stability and other geological hazards, and other geological engineering topics.

Field Hydrogeology GEOE 429 1-4 Lab Hydrogeology for Engineers GEOE 420

Provides 1-4 weeks of intensive training in field methods of applied hydrogeology, including water-well drilling, design and completion of monitoring wells, pumping tests, slug tests, stream gaging, water-level surveys, and water-quality sampling and analysis. Students will be trained on equipment used for these field methods. A fee for supplies, transportation, and other logistical expenses is required.

Course Outcomes: Graduates will be able to:

1. Use state-of-the-art hydrogeological equipment to collect water-level and water-quality data.
2. Set up and run an aquifer pumping test and manual slug tests in the field, and interpret the data to determine aquifer properties.
3. Perform stream gaging and tracer tests to determine stream flow rates.
4. Gain experience working around drilling contractors and their equipment in a safe manner.
5. Work as a team to maximize data collection and report-writing under rigorous field conditions and strict time deadlines.

This should include what will appear in the catalog, exactly. New course require course outcomes listed in this area.

List of supporting documentation attached:

1. Syllabuses for each class (module)
2. Old and new curriculum worksheets attached

Assessment Leading to Request

We have been teaching a Field Geology and Geophysics course in cooperation with the Geophysical Engineering department for about two decades, and a Field Hydrogeology class for about as long. The cost in both time and money for students has been significant, especially for the hydrogeology students that have been required to take 8 credits of summer courses and incurring $1000 or more in additional field fees. In consultation with our IAB, we have concluded that our students are not well served by the current system. Therefore, we would like to break the field classes up into modules. This is to be organized so students can take field-oriented classes more closely aligned with their interest, or take one or more to broaden their studies.

Changes to the Field Hydrogeology course description need to be done for a number of reasons:

1) The course is currently listed as a 3 cr course.
2) Enrollment for this course has been high enough that we have taught it every year since 2017, so we would like to remove the wording about every other year to correct the catalog description.
3) The updated description is more accurate as to the topics covered.
4) The previous wording of this being well-suited for several degrees is not needed. Undergraduate and graduate students from a range of programs take the course if it suits them, including those minoring in Hydrogeology, completing the geological engineering hydrogeology option, completing a M.S. in Geoscience with a hydrogeology focus.

Anticipated Impacts to "Other" Programs

These modules are designed to replace the current course GEOE 409 Field Geology and Geophysics, which is co-listed as GEOP 421, taught in cooperation with the Geophysical Engineering Department. The class has been required for both the Geological Engineering and the Geophysical Engineering B.S. programs. Therefore, changing to this modular structure will affect that program. We want to have our students have the option of taking geophysics classes with field components, so are interested to understand how the Geophysics program may be incorporating field methods in their courses in the future. We would hope that those students in the Geophysical Engineering program would still participate in the Field Geology, or any other module, depending on the student's interest.

Impact on Library: Larry Smith has consulted with Ulana Holtz (03/06/2020) at the Montana Tech library to ensure needed materials and media are available. (Or No consultation is required since changes are only in the course number, course name, or course pre-requisites.)

Date to take effect: 05/01/2020

MontanaTech *Curriculum Change Request Form Dated 6 September 2019*

APPROVALS

Department Head Approval Larry Smith **Date** 04/09/2020

Dean Approval Dan Trudnowski **Date** 4/13/2020

Graduate Council Approval David Hood Date 4/19/20

CRC Approval _____ Date _____

Faculty Senate Approval _____ Date _____

VCAA Approval (see below) _____ Date _____

Chancellor Approval (see below) _____ Date _____

LEVEL of Request

Please indicate the type of request(s) by selecting *all that apply*:

Faculty Approvals (directly to CRC, then Faculty Senate):

- X Establish a new course for the catalog (please contact the Registrar of MUS CCN information)
- ☐ Changed course: addition, deletion or change of title, credit, course number, pre-req, description, or cross listing.
- X Amend an existing degree program. Making changes to programs such as adding a writing course to a major, changing the list of accepted electives or removing a requirement of a minor
- ☐ New degree certification program of 29 credits or less
- ☐ Other:

Campus Approvals (must be approved by the VCAA prior to CRC submission):

- ☐ Placing a postsecondary educational program into moratorium
- ☐ Withdrawing a postsecondary educational program from moratorium
- ☐ Establishing, re-titling, terminating or revising a campus certificate of 29 credits or more
- ☐ Establishing a B.A.S./A.A./A.S. area of study
- ☐ Offering an existing postsecondary educational program via distance or online delivery
- ☐ Other:

OCHE Approvals *(must be approved by the VCAA and Chancellor prior to CRC submission)*:

- ☐ Re-titling an existing postsecondary educational program
- ☐ Terminating an existing postsecondary educational program
- ☐ Consolidating existing postsecondary educational programs
- ☐ Establishing a new minor where there is a major or an option in a major
- ☐ Revising a postsecondary educational program
- ☐ Establishing a temporary C.A.S. or A.A.S. degree program Approval limited to 2 years
- ☐ Other:

Level II *(must be approved by the VCAA and Chancellor prior to CRC submission)*:

- ☐ Establishing a new postsecondary educational program
- ☐ Exceeding the 120 credit maximum for baccalaureate degrees Exception to policy 301.11
- ☐ Forming, eliminating or consolidating an academic, administrative, or research unit
- ☐ Re-titling an academic, administrative, or research unit
- ☐ Other:

MontanaTech *Curriculum Change Request Form Dated 8 May 2017*

Protocol: The department requesting curriculum change holds a discussion at the departmental level, and if agreed upon by the department head, discuss with the Dean for approval. Forward the completed form along with supporting information to the CRC chair after approval from the department head, dean, and graduate council if necessary. Final changes are then made by the registrar after faculty senate approval. Guidance: https://www.umt.edu/provost/faculty/curriculum/default.php.

Date 04/05/2020
Dept. Geological Engineering **College** SME
Program: B.S. Geological Engineering; M.S. Geoscience
Description of Request/Summary: Changing the wording of the catalog description for GEOE 520 Advanced hydrogeology

Current Course Program Information:

An extension of GEOE 420 focusing on a more in depth look at the movement and occurrence of groundwater, under non-ideal conditions. Production well construction and design will be expanded to well field development and dewatering methods. Advanced applications of aquifer analysis, using a variety of techniques with groundwater exploration and development issues will be evaluated with case histories and student projects. Advanced topics and design are emphasized.

Proposed Change (Attach syllabus or curriculum for new course or curriculum changes.)

Course # Name	Credits	Pre-req.
An extension of GEOE 420 focusing on a more in depth look at the movement and occurrence of groundwater, under non-ideal conditions. Advanced applications of aquifer analysis, using a variety of techniques with groundwater exploration and development issues will be evaluated with case histories and student projects. The course will focus on both regional and local hydrogeology, and will include physical along with environmental tracer analysis of aquifer systems.		

List of supporting documentation attached:

1. syllabus

Assessment Leading to Request

Previous catalog reflected material that is not currently covered, and left out some material that is covered. The current description is less specific and more general of what the course content covers.

Anticipated Impacts to "Other" Programs

No impact on other departments.

Impact on Library: No consultation is required since changes are only in the course number, course name, or course pre-requisites.

No consultation required.

Date to take effect: 08/24/2020

LEVEL of Request

Please indicate the type of request(s) by selecting *all that apply*:
Faculty Approvals (directly to CRC, then Faculty Senate):

- ☐ Establish a new course for the catalog (please contact the Registrar of MUS CCN information)
- X Changed course: addition, deletion or change of title, credit, course number, pre-req, description, or cross listing.

- ☐ Amend an existing degree program. Making changes to programs such as adding a writing course to a major, changing the list of accepted electives or removing a requirement of a minor
- ☐ New degree certification of 29 credits or less
- ☐ Other:

Campus Approvals (must be approved by the VCAA prior to CRC submission):

- ☐ Placing a postsecondary educational program into moratorium
- ☐ Withdrawing a postsecondary educational program from moratorium
- ☐ Establishing, re-titling, terminating or revising a campus certificate of 29 credits or more
- ☐ Establishing a B.A.S./A.A./A.S. area of study
- ☐ Offering an existing postsecondary educational program via distance or online delivery
- ☐ Other:

OCHE Approvals *(must be approved by the VCAA and Chancellor prior to CRC submission)*:

- ☐ Re-titling an existing postsecondary educational program
- ☐ Terminating an existing postsecondary educational program
- ☐ Consolidating existing postsecondary educational programs
- ☐ Establishing a new minor where there is a major or an option in a major
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- ☐ Other:

APPROVALS

Department Head Approval  **Date** 04/09/2020

Dean Approval _____ **Date** _____

Graduate Council Approval Beverly Hartline Date 04/14/2020

CRC Approval David Hood Date 4/19/20

Faculty Senate Approval _____ Date _____

VCAA Approval (see above) _____ Date _____

Chancellor Approval (see above) _____ Date _____

GEOE 520 Advanced Hydrogeology
Fall 2019

Professor: Dr. Glenn Shaw **Office:** MG 213E
Email: gshaw@mtech.edu
Phone: 496-4809

Course Outcomes:

1. Students will learn to critically analyze both physical and chemical hydrogeologic datasets for regional and local aquifer systems. This includes aquifer test datasets, interpretation of well logs, and the use of isotopes and other environmental tracers.
2. Students will learn to locate, understand, and integrate the state of the art methods in hydrogeology through reading and presenting the current and historical literature.

Texts: Scanned copies of important chapters will be provided of the following texts

1. Schwartz & Zhang (2002) *Fundamentals of Groundwater* ***Recommended***
2. Clark (2015) *Groundwater Geochemistry and Isotopes* ***Recommended***
3. Fetter (1999) *Contaminant Hydrogeology* ***Recommended***

Lectures: M & W 12:00-12:50, MG 201

Lectures will follow the thread of recommended texts, but new material will be presented, especially concerning practical applications and local examples. The course will be divided into 1. Physical Hydrogeology, 2. Tracer Hydrology, and 3. Contaminant Hydrogeology

Lecture Schedule:

Week	Subjects to cover (may change)	Text Chapters (chapter)
1 (8/26)	Hydrogeology Review; Confined aquifers	FGW ch. 9
2 (9/02)	Semi-Confined & unconfined Aquifers	FGW ch. 10 & 11
3 (9/09)	Overdamped and Underdamped Slug Tests	FGW ch. 12
4 (9/16)	Water Balance	FGW ch. 12
5 (9/23)	Step Drawdown and Recovery Data	FGW ch. 9, 11, and 12
6 (9/30)	Solutes in Groundwater	FGW ch. 16
7 (10/07)	Isotope Reactions	GGI ch. 4
8 (10/14)	Tracing the Water Cycle	GGI ch. 5
9 (10/21)	Endmember Mixing Models	no text
10 (10/28)	^{222}Rn in Groundwater	Env. Tracers ch. 6
11 (11/04)	Injected Tracers	no text
12 (11/11)	Mass Transport in Saturated Media	CHG ch. 2
13 (11/18)	Transformation, Retardation and Attenuation	CHG ch. 3
14 (11/25)	Trans, Ret, and Atten; Thanksgiving Break	CHG ch. 3
15 (12/02)	Vadose Zone Hydrology; LNAPLs	CHG ch. 4 & ch. 5
16 (12/09)	Final Examination Week	

Lecture portion:

There will be 2 take home midterms during lecture period and one Final Exam during scheduled final exam times. Tested material will come from both the lecture and the reading assignments.

Lab Schedule:

Week	Subjects to cover (may change)
1 (8/26)	Lab 1: Confined Aquifers
2 (9/02)	Lab 2: Semi-Confined & Unconfined Aquifers using AQTESOLV
3 (9/09)	Lab 3: X sections and water table maps (midterm 1)
4 (9/16)	Lab 4: Slug Tests (in class)
5 (9/23)	**MIDTERM 1**
6 (9/30)	Lab 5: Piper and Stiff Diagrams
7 (10/07)	Lab 6: Isotopes in Hydrology
8 (10/14)	Lab 7: Tracing Groundwater
9 (10/21)	Lab 8: EMMA
10 (10/28)	Lab 9: Radon Box Models
11 (11/04)	Lab 10: Injected Tracer Study
12 (11/11)	**MIDTERM 2**
13 (11/18)	Lab 11: Advection-Dispersion
14 (11/225)	Lab 12: Sorption
15 (12/02)	Lab 13: Vadose and NAPLS
16 (12/09)	**MIDTERM 3**

Lab portion:

Labs will meet every week in MG 201, beginning the *first week of class*. Attendance is mandatory. Sometimes lab will consist of lecturing on practical components, but there will also be a heavy component of in class activity in preparation for lab assignments.

Grading:

Labs (about 7 labs 20 pts each)	140 points
Midterms and Final Exam (each 50 pts)	150 points

- No Extra credit will *be allowed to substitute for assignments*
- Exams are take home.

International Students:

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MontanaTech *Curriculum Change Request Form Dated 8 May 2017*

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Date 04/05/2020
Dept. Geological Engineering **College** SME
Program: B.S. Geological Engineering; M.S. Geoscience
Description of Request/Summary: Changing the wording for the catalog description and the prerequisites for GEOE 528 Contaminant Transport to more accurately reflect material taught in this course.

Current Course Program Information:

A sequel class to GEOE 422. This course enhances the student's ability in groundwater flow modeling and adds the dimension of contaminant transport. State-of-the-art software packages are utilized to simulate a variety of field problems. The physical, chemical, and biological processes which control groundwater contamination are explored.

Prerequisite(s): GEOE 422.

Proposed Change (Attach syllabus or curriculum for new course or curriculum changes.)

Course # Name	**Credits**	**Pre-req.**
This course builds on GEOE 420, but focuses on the movement of contaminants in aquifers. The course covers both physical and chemical transport of contaminants. Advanced applications of contaminant transport will be used along with case histories and student projects. **Prerequisite(s): GEOE 420**		

List of supporting documentation attached:

1. syllabus

Assessment Leading to Request

The course has turned into a popular option for graduate students in outside departments who have not taken GEOE422, but have GEOE 420. Prior instructors used this course to build on groundwater flow modeling by introducing contaminants to the models. Currently the course focusses on theory behind transport and has weekly analytical lab reports, but not enough computer modeling to justify GEOE 422 Groundwater Flow Modeling as a prerequisite.

Anticipated Impacts to "Other" Programs

It will allow students in other departments to take this course with only one prior hydrogeology course instead of two.

Impact on Library: No consultation is required since changes are only in the course number, course name, or course pre-requisites.

none

Date to take effect: 08/24/2020

LEVEL of Request

Please indicate the type of request(s) by selecting *all that apply*:
Faculty Approvals (directly to CRC, then Faculty Senate):

- ☐ Establish a new course for the catalog (please contact the Registrar of MUS CCN information)
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- ☐ New degree certification of 29 credits or less
- ☐ Other:

Campus Approvals (must be approved by the VCAA prior to CRC submission):

- ☐ Placing a postsecondary educational program into moratorium
- ☐ Withdrawing a postsecondary educational program from moratorium
- ☐ Establishing, re-titling, terminating or revising a campus certificate of 29 credits or more
- ☐ Establishing a B.A.S./A.A./A.S. area of study
- ☐ Offering an existing postsecondary educational program via distance or online delivery
- ☐ Other:

OCHE Approvals *(must be approved by the VCAA and Chancellor prior to CRC submission)*:

- ☐ Re-titling an existing postsecondary educational program
- ☐ Terminating an existing postsecondary educational program
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- ☐ Other:

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- ☐ Re-titling an academic, administrative, or research unit
- ☐ Other:

APPROVALS

Department Head Approval _____ **Date** 04/09/2020

Dean Approval _____ **Date** _____

Graduate Council Approval Beverly Hartline Date 04/14/2020

CRC Approval David Hood Date 4/19/20

Faculty Senate Approval _____ Date _____

VCAA Approval (see above) _____ Date _____

Chancellor Approval (see above) _____ Date _____

GEOE 528 Contaminant Transport
Fall 2018

Professor: Dr. Glenn Shaw **Office:** MG 213E
Email: gshaw@mtech.edu
Phone: 496-4809

Course Outcomes:

1. Students will learn governing concepts that describe solute/contaminant transport in groundwater systems. They will learn how to take basic hydrogeologic and contaminant datasets and apply them to several analytical solutions to the advection-dispersion equation along with Darcy's Law.
2. Students will learn fundamental concepts of multiphase flow and how to apply those concepts to contaminants in aquifer systems.
3. Students will learn to locate, understand, and integrate the state of the art methods in contaminant hydrogeology through reading and presenting the current and historical literature.

Texts: Scanned copies of important chapters will be provided of the following texts

1. Fetter (2018) *Contaminant Hydrogeology 3rd Edition* ***Highly Recommended***

Lectures/Lab: M & W 5:00-7:00, MG 201

Lectures will follow the basics from the recommended text, but new material will be presented, especially concerning practical applications and local examples. The course will primarily focus on mass transport in a porous medium, but we will sometimes consider surface water and/or atmospheric contaminants. We will focus on physical, chemical, and some biological processes concerning mass transport.

Lecture Schedule:

Week	Subjects to cover (may change)	Text Chapters (chapter)
1 (8/27)	Hydrogeology Review; Contaminant Intro	ch. 1
2 (9/03)	Mass Transport in Saturated Media	ch. 2
3 (9/10)	Mass Transport in Saturated Media	ch. 2
4 (9/17)	Mass Transport in Saturated Media	ch. 2
5 (9/24)	Transformation, Retardation, and Attenuation	ch. 3
6 (10/01)	Transformation, Retardation, and Attenuation	ch. 3
7 (10/08)	Transformation, Retardation, and Attenuation	ch. 3
8 (10/15)	Flow and Transport in the Vadose Zone	ch. 4
9 (10/22)	Multiphase Flow	ch. 5
10 (10/29)	Multiphase Flow	ch. 5
11 (11/05)	Case Studies	no text
12 (11/12)	Modeling	no text
13 (11/19)	Modeling	no text
14 (11/26)	Modeling	no text
15 (12/03)	Other	no text

Lecture portion:

There will be 2 midterms during lecture period and one Final Exam during scheduled final exam times. Tested material will come from both the lecture and the reading assignments. The Final Exam will be cumulative, but will be weighted more towards material in the last 1/2 of the class.

Lab Schedule:

Week	Subjects to cover (may change)
1 (8/27)	Lab 1: Groundwater Flow
2 (9/03)	Lab 2: Advection, Mass Loading and Fluxes
3 (9/10)	Lab 3:Mechanical Disperson & Diffusion
4 (9/17)	Lab 4: Analytical Solutions to the Advection-Dispersion Equation
5 (9/24)	Lab 5: Case Study
6 (10/01)	Lab 6: Sorption Isotherms and Retardation
7 (10/08)	Lab 7: Radioactive Decay
8 (10/15)	Lab 8: Colloids and Biodegradation
9 (10/22)	Lab 9: Vadose Zone
10 (10/29)	Lab 10: NAPLs
11 (11/05)	**MIDTERM 1**
12 (11/12)	Lab 11: Final Project
13 (11/19)	Lab 12: Final Project
14 (11/26)	Lab 13: Final Project
15 (12/03)	**FINAL EXAM**

Lab portion:

Labs will meet every week in MG 201, beginning the *first week of class*. Attendance is mandatory. Sometimes lab will consist of lecturing on practical components, but there will also be a heavy component of in class activity in preparation for lab assignments.

Grading:

Labs (ten lab assignments and a final project)	260 points
Midterms and Final Exam (each 100 pts)	200 points

Professional communication:

Outside of class, email is our preferred way to communicate, but be professional in your writing. This promotes respect between us. Always include your name and my name. Do not address someone as "Hey." For 12 rules in professional communication and more information, see: http://office.microsoft.com/en-us/outlook-help/12-tips-for-better-e-mail-etiquette-HA001205410.aspx

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Date 04/05/2020
Dept. Geological Engineering **College** SME
Program: B.S. Geological Engineering; M.S. Geoscience
Description of Request/Summary: Changing the wording for the catalog description and the prerequisites for GEOE 528 Contaminant Transport to more accurately reflect material taught in this course.

Current Course Program Information:

A sequel class to GEOE 422. This course enhances the student's ability in groundwater flow modeling and adds the dimension of contaminant transport. State-of-the-art software packages are utilized to simulate a variety of field problems. The physical, chemical, and biological processes which control groundwater contamination are explored.

Prerequisite(s): GEOE 422.

Proposed Change (Attach syllabus or curriculum for new course or curriculum changes.)

Course # Name	**Credits**	**Pre-req.**
This course builds on GEOE 420, but focuses on the movement of contaminants in aquifers. The course covers both physical and chemical transport of contaminants. Advanced applications of contaminant transport will be used along with case histories and student projects. **Prerequisite(s): GEOE 420**		

List of supporting documentation attached:

1. syllabus

Assessment Leading to Request

The course has turned into a popular option for graduate students in outside departments who have not taken GEOE422, but have GEOE 420. Prior instructors used this course to build on groundwater flow modeling by introducing contaminants to the models. Currently the course focusses on theory behind transport and has weekly analytical lab reports, but not enough computer modeling to justify GEOE 422 Groundwater Flow Modeling as a prerequisite.

Anticipated Impacts to "Other" Programs

It will allow students in other departments to take this course with only one prior hydrogeology course instead of two.

Impact on Library: No consultation is required since changes are only in the course number, course name, or course pre-requisites.

none

Date to take effect: 08/24/2020

LEVEL of Request

Please indicate the type of request(s) by selecting *all that apply*:
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- ☐ Establish a new course for the catalog (please contact the Registrar of MUS CCN information)
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APPROVALS

Department Head Approval _____ **Date** 04/09/2020

Dean Approval _____

Graduate Council Approval Beverly Hartline Date 04/14/2020

CRC Approval David Hood Date 4/19/20

Faculty Senate Approval _____ Date _____

VCAA Approval (see above) _____ Date _____

Chancellor Approval (see above) _____ Date _____

GEOE 528 Contaminant Transport
Fall 2018

Professor: Dr. Glenn Shaw **Office:** MG 213E
Email: gshaw@mtech.edu
Phone: 496-4809

Course Outcomes:

1. Students will learn governing concepts that describe solute/contaminant transport in groundwater systems. They will learn how to take basic hydrogeologic and contaminant datasets and apply them to several analytical solutions to the advection-dispersion equation along with Darcy's Law.
2. Students will learn fundamental concepts of multiphase flow and how to apply those concepts to contaminants in aquifer systems.
3. Students will learn to locate, understand, and integrate the state of the art methods in contaminant hydrogeology through reading and presenting the current and historical literature.

Texts: Scanned copies of important chapters will be provided of the following texts

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Lectures/Lab: M & W 5:00-7:00, MG 201

Lectures will follow the basics from the recommended text, but new material will be presented, especially concerning practical applications and local examples. The course will primarily focus on mass transport in a porous medium, but we will sometimes consider surface water and/or atmospheric contaminants. We will focus on physical, chemical, and some biological processes concerning mass transport.

Lecture Schedule:

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15 (12/03)	Other	no text

Lecture portion:

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14 (11/26)	Lab 13: Final Project
15 (12/03)	**FINAL EXAM**

Lab portion:

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Grading:

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Midterms and Final Exam (each 100 pts)	200 points

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(406) 496-4429, joneill@mtech.edu

MontanaTech *Curriculum Change Request Form Dated 6 September 2018*

Date 02/26/20
Dept. Geophysics
Program Geophysics

College SME
CRC Representative Marv Speece

Description of Request: Add CHMY 144 and drop EGEN 194.

Current Course or Program Information: See attached curriculum worksheets.

Proposed Change

Course # Name	Credits	Pre-req.
Drop		
EGEN 194, Intro to Engineering Seminar	1	
Add		
CHMY 144, College Chemistry Lab II	1	co-requisite CHMY 143

List of supporting documentation attached:
See old and new curriculum worksheet

Assessment Leading to Request
EGEN 194 requires a co-requisite EGEN 101

Anticipated Impacts to "Other" Programs
None

Impact on Library: NA.

Date to take effect: Fall semester, 2020.

MontanaTech *Curriculum Change Request Form Dated 6 September 2018*

APPROVALS

Department Head Approval _____ **Date** 3-31-20

Dean Approval Dan Trudnowski **Date** 4/8/2020

Graduate Council Approval David Hood **Date** 4/19/20

CRC Approval _____ **Date** _____

Faculty Senate Approval _____ **Date** _____

VCAA Approval (see below) _____ **Date** _____

Chancellor Approval (see below) _____ **Date** _____

LEVEL of Request

Please indicate the type of request(s) by selecting *all that apply*:

Faculty Approvals (directly to CRC, then Faculty Senate):

- ☐ Establish a new course for the catalog (please contact the Registrar of MUS CCN information)
- ☐ Changed course: addition, deletion or change of title, credit, course number, pre-req, description, or cross listing.
- ☑ Amend an existing degree program. Making changes to programs such as adding a writing course to a major, changing the list of accepted electives or removing a requirement of a minor
- ☐ New degree certification program of 29 credits or less
- ☐ Other:

Campus Approvals (must be approved by the VCAA prior to CRC submission):

- ☐ Placing a postsecondary educational program into moratorium
- ☐ Withdrawing a postsecondary educational program from moratorium
- ☐ Establishing, re-titling, terminating or revising a campus certificate of 29 credits or more
- ☐ Establishing a B.A.S./A.A./A.S. area of study
- ☐ Offering an existing postsecondary educational program via distance or online delivery
- ☐ Other:

OCHE Approvals *(must be approved by the VCAA and Chancellor prior to CRC submission)*:

- ☐ Re-titling an existing postsecondary educational program
- ☐ Terminating an existing postsecondary educational program
- ☐ Consolidating existing postsecondary educational programs
- ☐ Establishing a new minor where there is a major or an option in a major
- ☐ Revising a postsecondary educational program
- ☐ Establishing a temporary C.A.S. or A.A.S. degree program Approval limited to 2 years
- ☐ Other:

Level II *(must be approved by the VCAA and Chancellor prior to CRC submission)*:

- ☐ Establishing a new postsecondary educational program
- ☐ Exceeding the 120 credit maximum for baccalaureate degrees Exception to policy 301.11
- ☐ Forming, eliminating or consolidating an academic, administrative, or research unit
- ☐ Re-titling an academic, administrative, or research unit
- ☐ Other:

MontanaTech *Curriculum Change Request Form Dated 6 September 2018*

Date 02/26/20
Dept. Geophysics
Program Geophysics

College SME
CRC Representative Marv Speece

Description of Request: PHSX 423: Change wording in catalog from "generally offered second semester" to "generally offered first semester".

Current Course or Program Information:

PHSX 423 - Electricity & Magnetism I

3 credits (Hrs: 3 Lec.)

Considers the calculus of vectors and fields; basic laws of electrostatics and magnetostatics; boundary value problems; derivation of capacitance and inductance; non-time varying Maxwell's equations; relationship between force, charge and motion in electric and magnetic fields. Extension to time varying electric and magnetic field, time varying Maxwell's equations, derivations of the wave equation for time harmonic fields, the plane wave solution of the wave equation, interaction of plane electromagnetic waves to dielectric boundaries, perfect conducting boundaries, and lossy media boundaries.

Prerequisite(s): M 274; PHSX 237 & PHSX 238; **Corequisite(s):** EELE 203 or M 405 or PHSX 453 or Consent of Instructor. Course generally offered 2nd semester.

Proposed Change

Course # Name	Credits	Pre-req.
PHSX 423, Electricity & Magnetism I	3	M 274; PHSX 237 & PHSX 238 Corequisite(s): EELE 203 or M 405 or PHSX 453 Or Consent of Instructor. Course generally offered 1st semester.

List of supporting documentation attached:

Assessment Leading to Request
This change is at the request of the Electrical Engineering Department.

Anticipated Impacts to "Other" Programs
None other than Electrical Engineering.

Impact on Library: NA.

Date to take effect: Fall Semester, 2020.

MontanaTech *Curriculum Change Request Form Dated 6 September 2018*

APPROVALS

Department Head Approval _____ **Date** 3-31-20

Dean Approval Dan Trudnowski **Date** 4/8/2020

Graduate Council Approval _____ Date _____

CRC Approval _____ Date _____

Faculty Senate Approval _____ Date _____

VCAA Approval (see below) _____ Date _____

Chancellor Approval (see below) _____ Date _____

LEVEL of Request

Please indicate the type of request(s) by selecting *all that apply*:

Faculty Approvals (directly to CRC, then Faculty Senate):

- ☐ Establish a new course for the catalog (please contact the Registrar of MUS CCN information)
- ☑ Changed course: addition, deletion or change of title, credit, course number, pre-req, description, or cross listing.
- ☐ Amend an existing degree program. Making changes to programs such as adding a writing course to a major, changing the list of accepted electives or removing a requirement of a minor
- ☐ New degree certification program of 29 credits or less
- ☐ Other:

Campus Approvals (must be approved by the VCAA prior to CRC submission):

- ☐ Placing a postsecondary educational program into moratorium
- ☐ Withdrawing a postsecondary educational program from moratorium
- ☐ Establishing, re-titling, terminating or revising a campus certificate of 29 credits or more
- ☐ Establishing a B.A.S./A.A./A.S. area of study
- ☐ Offering an existing postsecondary educational program via distance or online delivery
- ☐ Other:

OCHE Approvals *(must be approved by the VCAA and Chancellor prior to CRC submission)*:

- ☐ Re-titling an existing postsecondary educational program
- ☐ Terminating an existing postsecondary educational program
- ☐ Consolidating existing postsecondary educational programs
- ☐ Establishing a new minor where there is a major or an option in a major
- ☐ Revising a postsecondary educational program
- ☐ Establishing a temporary C.A.S. or A.A.S. degree program Approval limited to 2 years
- ☐ Other:

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- ☐ Establishing a new postsecondary educational program
- ☐ Exceeding the 120 credit maximum for baccalaureate degrees Exception to policy 301.11
- ☐ Forming, eliminating or consolidating an academic, administrative, or research unit
- ☐ Re-titling an academic, administrative, or research unit
- ☐ Other:

MontanaTech *Curriculum Change Request Form Dated 6 September 2018*

Date 02/26/20
Dept. Geophysics
Program Geophysics

College SME
CRC Representative Marv Speece

Description of Request: Change name of GEOP 475W. Modify course description.

Current Course or Program Information:
GEOP 475W, Geophysical Engineering Design
3 credits (2 Lec., 3 Lab.)
A senior level design course requiring the integration of principles, knowledge and skills developed in previous course work. The design problem in geophysical engineering includes the integration of existing geological anc geophysical data, specifications for surveys and further data acquisition and as a final phase, the synthesis of all of the information into a geologically reasonable interpretation.

Proposed Change

Course # Name	Credits	Pre-req.
GEOP 475W, Geophysics Senior Project	3	Senior Standing

3 credits (2 Lec., 3 Lab.)
A senior level project course requiring the integration of principles, knowledge and skills developed in previous course work. Projects can include the integration of existing geological and geophysical data, specifications for geophysical surveys and further data acquisition and as a final phase, the synthesis of all of the information into a geologically reasonable interpretation.

List of supporting documentation attached:

Assessment Leading to Request
This change is because the switch from an engineering degree to a science degree.

Anticipated Impacts to "Other" Programs
None

Impact on Library: NA.

Date to take effect: Fall semester, 2020.

MontanaTech *Curriculum Change Request Form Dated 6 September 2018*

APPROVALS

Department Head Approval _____ **Date** 3-31-20

Dean Approval Dan Trudnowski **Date** 4/8/2020

Graduate Council Approval _____ Date _____

CRC Approval _____ Date _____

Faculty Senate Approval _____ Date _____

VCAA Approval (see below) _____ Date _____

Chancellor Approval (see below) _____ Date _____

LEVEL of Request

Please indicate the type of request(s) by selecting *all that apply*:

Faculty Approvals (directly to CRC, then Faculty Senate):

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- ☐ New degree certification program of 29 credits or less
- ☐ Other:

Campus Approvals (must be approved by the VCAA prior to CRC submission):

- ☐ Placing a postsecondary educational program into moratorium
- ☐ Withdrawing a postsecondary educational program from moratorium
- ☐ Establishing, re-titling, terminating or revising a campus certificate of 29 credits or more
- ☐ Establishing a B.A.S./A.A./A.S. area of study
- ☐ Offering an existing postsecondary educational program via distance or online delivery
- ☐ Other:

OCHE Approvals *(must be approved by the VCAA and Chancellor prior to CRC submission)*:

- ☐ Re-titling an existing postsecondary educational program
- ☐ Terminating an existing postsecondary educational program
- ☐ Consolidating existing postsecondary educational programs
- ☐ Establishing a new minor where there is a major or an option in a major
- ☐ Revising a postsecondary educational program
- ☐ Establishing a temporary C.A.S. or A.A.S. degree program Approval limited to 2 years
- ☐ Other:

Level II *(must be approved by the VCAA and Chancellor prior to CRC submission)*:

- ☐ Establishing a new postsecondary educational program
- ☐ Exceeding the 120 credit maximum for baccalaureate degrees Exception to policy 301.11
- ☐ Forming, eliminating or consolidating an academic, administrative, or research unit
- ☐ Re-titling an academic, administrative, or research unit
- ☐ Other:

CURRICULUM WORKSHEET

Geophysics

2019-2020 Catalog

Last Revised 1/14/2019

Name _____

Advisor _____ Date_____

	Course ID	Description	Semester	Grade	CR	Math/ Sci.	HSS	Other	Semester Total
Freshman First	CHMY 141	College Chemistry I			3	3			
	CHMY 142	General Chemistry Lab I			1	1			
	WRIT 1xx	College Writing,Technical Writing			3			3	
	EGEN 194	Intro to Engineering Seminar			1				
	M 171	Calculus I			3	3			
	HSS Elec	Humanities/Social Science			3		3		14
Freshman Second Semester	CHMY 143	College Chemistry II			3	3			
	GEOP 101	Introduction to Geophysics			1	1			
	GPHY 284	Intro to GIS Science Cartography			3			3	
	PHSX 234	Gen Physics - Mech.			3	3			
	M 172	Calculus II			3	3			
	GEO 101	Intro to Physical Geology			3	3			16
First Semester	CSCI 117	Matlab Programming			3	3			
	MIN 210	Plane Surveying			3	3			
	M 273	Multivariable Calculus			4	4			
	PHSX 235	Gen. Physics - H, S, & O			3	3			
	PHSX 236	General Physics Lab			1	1			14
Soph. Second Semester	GEO 204	Intro to Min. - Petro w/ Lab			3	3			
	GEOP 225	Physics of the Earth			3	3			
	M 274	Intro to Differential Equations			3	3			
	PHSX 237	General Physics-E, M, & W			3	3			
	PHSX 238	General Physics Lab			1	1			
	HSS Elec	Humanities/Social Science			3		3		16
Junior First Semester	PHSX 453	Math Methods of Physics			3	3			
	GEOP 302	Elements of Geophysics			3	3			
	M 333	Matrices & Linear Algebra			3	3			
	STAT 332	Stats for Scientists & Engr			3	3			
	ECNS 2XX	Micro, Macro, Micro/Macro			3		3		15
Junior Second Semester	HSS Elec	Humanities/Social Science			3		3		
	GEOP 412	Gravity & Magnetic Explor.			3	3			
	GEOP 446	Applied Linear Systems			3	3			
	GEOE 403	Structural Geo for Engineers			3	3			
	WRIT 321W	Advanced Tech Writing			3			3	15
Summer	GEOP 421	Geophysics Field Camp			6	6			6
Senior First Semester	GEOP 401	Intro to Seismic Processing			3	3			
	GEOP 408	Seismic Prospecting			3	3			
	GEOP 410	Electrical Prospecting			3	3			
	GEOE Elec	GEOE Elective			3	3			12
Senior Second	GEOP 450	Inversion: Exp Des & Interpret			3	3			
	GEOP 475W	Geop Engineering Design			3	3			
	Tec Elec	Technical Elective			3	3			
	GEOE Elec	GEOE Elective			3	3			12
		TOTAL			120	98	12	9	120

WRIT 1xx: WRIT 101-College Writing I, WRIT 121-Introduction to Technical Writing (Preferred)

ECNS 2xx: ECNS 201-Micro Econ, ECNS 202-Macro Econ, ECNS 203-Micro/Macro Econ (Preferred)

HSS: 2 Humanities courses and 1 Social Science course from the list of approved General Education courses.

GEOE Elec: GEO 257, GEOE 357, GEOE 406, GEOE 410, GEOE 411, GEOE 420, GEOE 422, MIN 418, PET 348
Course appropriate to student and approved by advisor.

Tec Elec M 405, M 410, GEO 257, GEOP 4XX (Remote Sensing), GEOP 4XX (Petrophysics)
GEOE 357, GEOE 406, GEOE 410, GEOE 411, GEOE 420, GEOE 422, MIN 418, PET 348
Course appropriate to student and approved by advisor.

CURRICULUM WORKSHEET

Geophysics

2020-2021 Catalog

Last Revised 3/31/2020

Name _____

Advisor _____ Date_____

	Course ID	Description	Semester	Grade	CR	Math/ Sci.	HSS	Semester Other	Semester Total
Freshman First	CHMY 141	College Chemistry I			3	3			
	CHMY 142	College Chemistry Lab I			1	1			
	WRIT 1xx	College Writing,Technical Writing			3			3	
	M 171	Calculus I			3	3			
	HSS Elec	Humanities/Social Science			3		3		13
Freshman Second Semester	CHMY 143	College Chemistry II			3	3			
	CHMY 144	College Chemistry Lab II			1	1			
	GEOP 101	Introduction to Geophysics			1	1			
	GPHY 284	Intro to GIS Science Cartography			3			3	
	PHSX 234	Gen Physics - Mech.			3	3			
	M 172	Calculus II			3	3			
	GEO 101	Intro to Physical Geology			3	3			17
First Semester	CSCI 117	Matlab Programming			3	3			
	MIN 210	Plane Surveying			3	3			
	M 273	Multivariable Calculus			4	4			
	PHSX 235	Gen. Physics - H, S, & O			3	3			
	PHSX 236	General Physics Lab			1	1			14
Soph. Second Semester	GEO 204	Intro to Min. - Petro w/ Lab			3	3			
	GEOP 225	Physics of the Earth			3	3			
	M 274	Intro to Differential Equations			3	3			
	PHSX 237	General Physics-E, M, & W			3	3			
	PHSX 238	General Physics Lab			1	1			
	HSS Elec	Humanities/Social Science			3		3		16
Junior First Semester	PHSX 453	Math Methods of Physics			3	3			
	GEOP 302	Elements of Geophysics			3	3			
	M 333	Matrices & Linear Algebra			3	3			
	STAT 332	Stats for Scientists & Engr			3	3			
	ECNS 2XX	Micro, Macro, Micro/Macro			3		3		15
Junior Second Semester	HSS Elec	Humanities/Social Science			3		3		
	GEOP 412	Gravity & Magnetic Explor.			3	3			
	GEOP 446	Applied Linear Systems			3	3			
	GEOE 403	Structural Geo for Engineers			3	3			
	WRIT 321W	Advanced Tech Writing			3			3	15
Summer	GEOP 421	Geophysics Field Camp			6	6			6
Senior First Semester	GEOP 401	Intro to Seismic Processing			3	3			
	GEOP 408	Seismic Prospecting			3	3			
	GEOP 410	Electrical Prospecting			3	3			
	GEOE Elec	GEOE Elective			3	3			12
Senior Second	GEOP 450	Inversion: Exp Des & Interpret			3	3			
	GEOP 475W	Geophysics Senior Project			3	3			
	Tec Elec	Technical Elective			3	3			
	GEOE Elec	GEOE Elective			3	3			12
		TOTAL			120	99	12	9	120

WRIT 1xx: WRIT 101-College Writing I, WRIT 121-Introduction to Technical Writing (Preferred)

ECNS 2xx: ECNS 201-Micro Econ, ECNS 202-Macro Econ, ECNS 203-Micro/Macro Econ (Preferred)

HSS: 2 Humanities courses and 1 Social Science course from the list of approved General Education courses.

GEOE Elec: GEO 257, GEOE 357, GEOE 406, GEOE 410, GEOE 411, GEOE 420, GEOE 422, MIN 418, PET 348
Course appropriate to student and approved by advisor.

Tec Elec M 405, M 410, GEO 257, GEOP 425, GEOP 427
GEOE 357, GEOE 406, GEOE 410, GEOE 411, GEOE 420, GEOE 422, MIN 418, PET 348
Course appropriate to student and approved by advisor.

MontanaTech *Curriculum Change Request Form Dated 8 May 2017*

Protocol: The department requesting curriculum change holds a discussion at the departmental level, and if agreed upon by the department head, discuss with the Dean for approval. Forward the completed form along with supporting information to the CRC chair after approval from the department head, dean, and graduate council if necessary. Final changes are then made by the registrar after faculty senate approval. Guidance: https://www.umt.edu/provost/faculty/curriculum/default.php.

Date **04/05**/2020
Dept. **Geological Engineering** **College** **SME**
Program: **Geological Engineering**
Description of Request/Summary:
We are modifying the hydrogeology minor to allow related coursework to count towards the minor. The current minor is attractive to environmental engineering with allowing 3 credits of Soil & subsurface remediation. We have had several students from geophysics, petroleum engineering and other take complete the hydrogeology minor by allowing course substitutions in related topics in their field of study (e.g. electrical prospecting, which has a strong hydrogeologic component for geophysical engineering students). The minor has attracted both undergraduate and graduate students, so co-listed courses (400/500 level) are listed.

Current Course Program Information:
Hydrogeology Minor
Course Requirements
GEO 101 - Introduction to Physical Geology 3 credits
GEOE 420 - Hydrogeology For Engineers 3 credits
GEOE 422 - Groundwater Flow Modeling 3 credits
GEOE 429 - Field Hydrogeology 2 credits

GEOE 528 - Contaminant Transport 3 credits
-OR-
GEOE 520 - Advanced Hydrogeology 3 credits
-OR-
GEOE 533 - Hydro-Geochemistry 3 credits

EENV 430 - Soil & Subsurface Remediation 3 credits
- OR -
ENVE 5300 - Subsurface Remediation 3 credits

Proposed Change (Attach syllabus or curriculum for new course or curriculum changes.)

Course # Name	**Credits**	**Pre-req.**

Course Requirements
GEO 101 - Introduction to Physical Geology 3 credits
GEOE 420 - Hydrogeology For Engineers 3 credits
GEOE 422 - Groundwater Flow Modeling 3 credits
GEOE 429 - Field Hydrogeology 2 credits

GEOE 528 - Contaminant Transport 3 credits
-OR-
GEOE 520 - Advanced Hydrogeology 3 credits

Take 4 credits of the following
CHMY 442 or 540- Environmental Chemistry 3 credits
CHMY 532 – Geochemical Modeling 3 credits
ECIC 431—Open Channel Hydraulics
ECIV 486 – Soil Mechanics & Foundation Design 3 credits
ECIV 487—Soil Mechanics Lab 1 credit
EENV 402 or ENVE 5020—Surface Water Hydrology 3 credits
EENV 432 or ENVE 5300—Soil & Subsurface Remediation 3 credits
GEO 209—Introduction to Field Geology 1 credit
GEOE 585—GIS of Natural Resources 3 credits

GEOP 410 or GEOP 520—Electrical Prospecting 3 credits
GEOP 525—Remote Sensing for Earth Sciences 3 credits
MIN 444—Environmental Management & Design of Mines 3 credits
NRSM 435 or NRSM 535—Restoration I 3 credits
NRSM 494 or NRSM 594—Restoration Seminar 1 credit
PET 205—Petroleum Engineering lab 1 1 credit
PET 304—Rock Properties 3 credits
PET 410—Reservoir Simulation 3 credits

List of supporting documentation attached:
None

Assessment Leading to Request
The course has turned into a popular option for graduate students in outside departments who have not taken GEOE422, but have GEOE 420. Prior instructors used this course to build on groundwater flow modeling by introducing contaminants to the models. Currently the course focusses on theory behind transport and has weekly analytical lab reports, but not enough computer modeling to justify GEOE 422 Groundwater Flow Modeling as a prerequisite.

Anticipated Impacts to "Other" Programs
We anticipate that these changes will attract more students from outside departments to complete the hydrogeology minor.

Impact on Library: No consultation is required since changes are only in the course number, course name, or course pre-requisites.)

No consultation needed

Date to take effect: 08/24/2020

LEVEL of Request
Please indicate the type of request(s) by selecting *all that apply*:
Faculty Approvals (directly to CRC, then Faculty Senate):

- ☐ Establish a new course for the catalog (please contact the Registrar of MUS CCN information)
- ☐ Changed course: addition, deletion or change of title, credit, course number, pre-req, description, or cross listing.
  X Amend an existing degree program. Making changes to programs such as adding a writing course to a major, changing the list of accepted electives or removing a requirement of a minor
- ☐ New degree certification program of 29 credits or less
- ☐ Other:

Campus Approvals (must be approved by the VCAA prior to CRC submission):

- ☐ Placing a postsecondary educational program into moratorium
- ☐ Withdrawing a postsecondary educational program from moratorium
- ☐ Establishing, re-titling, terminating or revising a campus certificate of 29 credits or more
- ☐ Establishing a B.A.S./A.A./A.S. area of study
- ☐ Offering an existing postsecondary educational program via distance or online delivery
- ☐ Other:

OCHE Approvals *(must be approved by the VCAA and Chancellor prior to CRC submission)*:

- ☐ Re-titling an existing postsecondary educational program
- ☐ Terminating an existing postsecondary educational program
- ☐ Consolidating existing postsecondary educational programs
- ☐ Establishing a new minor where there is a major or an option in a major
- ☐ Revising a postsecondary educational program
- ☐ Establishing a temporary C.A.S. or A.A.S. degree program Approval limited to 2 years
- ☐ Other:

Level II *(must be approved by the VCAA and Chancellor prior to CRC submission)*:

- ☐ Establishing a new postsecondary educational program
- ☐ Exceeding the 120 credit maximum for baccalaureate degrees Exception to policy 301.11
- ☐ Forming, eliminating or consolidating an academic, administrative, or research unit
- ☐ Re-titling an academic, administrative, or research unit
- ☐ Other:

APPROVALS

Department Head Approval _____ **Date** 04/09/2020

Dean Approval Dan Trudnowski **Date** 4/9/2020

Graduate Council Approval David Hood Date 4/19/20

CRC Approval _____ Date _____

Faculty Senate Approval _____ Date _____

VCAA Approval (see above) _____ Date _____

Chancellor Approval (see above) _____ Date _____

MontanaTech *Curriculum Change Request Form Dated 6 September 2019*

Date 04/07/2020
Dept. Mechanical Engineering **College School of Mines and Engineering (SME)**
Program Mechanical Engineering **CRC Representative: Peter Lucon**

Description of Request: The curriculum consists of 136 credits and 17 of those are Professional Electives. We are assigning new numbers for the professional electives that were taught as 491 classes, taking approved professional electives off the list, and clarifying further intent of some of the professional elective categories

Current Course or Program Information: Current overall curriculum has 136 credits.
Current curriculum sheet is attached for reference.

Proposed Changes

1. Add EMEC 498 and limit to 3 credits maximum allowed as a professional elective. Also increased to 3 credits allowed per internship (increase from 2).
2. Limit professional electives in Math/Statistics to 3 credits.
3. Remove ECIV 312 and ECIV 307.
4. Assign permanent course numbers for Product Development, Impact Dynamics, Advanced Fluids and Rocket Propulsion.

List of supporting documentation attached:

1. **Current Curriculum Worksheet**
2. **Revised Curriculum Worksheet listing course as a professional elective with an actual course number**

Assessment Leading to Request

The list of professional electives was reviewed through our ABET evaluation for continuous improvement. The language for the intent of some professional elective categories was not clear to the students. Professional electives are continually evaluated for suitability for the ME program, and classes are added and removed to keep the most relevant classes pre-approved and recommended for our students.

Anticipated Impacts to "Other" Programs

Civil will have less students in ECIV 312 and 307.
Possibility exists for less students in Math and Statistics classes. Our intent was to only allow 3 credits of Math or Statistics course credits so that our students would obtain a Math or Statistics minor, which is still the intent of the language on the curriculum worksheet.

Impact on Library: No consultation is required since changes are only in the course number, course name, or course pre-requisites.

Date to take effect: Fall 2020

MontanaTech *Curriculum Change Request Form Dated 6 September 2019*

APPROVALS

Department Head Approval Jack L. Skinner **Date** 4/9/2020

Dean Approval _____ **Date** _____

Graduate Council Approval _____ Date _____

CRC Approval David Hood Date 4/19/20

Faculty Senate Approval _____ Date _____

VCAA Approval (see below) _____ Date _____

Chancellor Approval (see below) _____ Date _____

LEVEL of Request

Please indicate the type of request(s) by selecting *all that apply*:

Faculty Approvals (directly to CRC, then Faculty Senate):

- ☐ Establish a new course for the catalog (please contact the Registrar for MUS CCN information)
- ☐ Changed course: addition, deletion or change of title, credit, course number, pre-req, description, or cross listing.
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- ☐ Establishing a B.A.S./A.A./A.S. area of study
- ☐ Offering an existing postsecondary educational program via distance or online delivery
- ☐ Other:

OCHE Approvals *(must be approved by the VCAA and Chancellor prior to CRC submission)*:

- ☐ Re-titling an existing postsecondary educational program
- ☐ Terminating an existing postsecondary educational program
- ☐ Consolidating existing postsecondary educational programs
- ☐ Establishing a new minor where there is a major or an option in a major
- ☐ Revising a postsecondary educational program
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- ☐ Other:

Level II *(must be approved by the VCAA and Chancellor prior to CRC submission)*:

- ☐ Establishing a new postsecondary educational program
- ☐ Exceeding the 120 credit maximum for baccalaureate degrees Exception to policy 301.11
- ☐ Forming, eliminating or consolidating an academic, administrative, or research unit
- ☐ Re-titling an academic, administrative, or research unit
- ☐ Other:

MontanaTech *Curriculum Change Request Form Dated 6 September 2019*

Date 04/08/2020
Dept. Mechanical Engineering **College** School of Mines and Engineering
Program Mechanical Engineering **CRC Representative** Peter Lucon

Description of Request: Change of course number for EMEC 4XX / EMEC 5XX Impact Dynamics

Current Course or Program Information: We have taught this course as EMEC 4XX / EMEC 5XX Impact Dynamics since 2016 every Spring Semester. We want to assign a permanent course number.

Proposed Change

Course # Name	Credits	Pre-req.
EMEC 4XX / EMEC 5XX Impact Dynamics	3 (3 Lec.)	EGEN 202 – Engineering Mech-Dynamics and EGEN 305 – Mechanics of Materials

Catalog description:
EMEC 4XX / EMEC 5XX Impact Dynamics
3 Cr

A study of the dynamic response of structures involved in a collision and the application of the fundamental theory of rigid bodies for multi-degree of impact events, discrete and continuum modeling of the contact region, stress wave propagation in a deformable body, and vibration in flexible structures.

Course objectives:
- To predict and interpret the dynamic response of structures involved in a collision;
- To design impact-related sporting equipment, armor, and automobile components;
- To analyze the fragmentation mechanism of rocks in impact crushing, drilling, and blasting for industries including mining.

List of supporting documentation attached:
- Syllabus
- Curriculum worksheet

Assessment Leading to Request
Impact dynamics is a relevant topic and aligned with our machine design and materials engineering focus. The class will expose undergraduate and graduate students to the fundamentals of impact dynamics and provides an avenue to share on-campus and broader scientific community research in the area.

Anticipated Impacts to "Other" Programs
This course can be a professional elective for other undergraduate programs in the School of Mines and Engineering.

Impact on Library: No consultation is required since changes are only in the course number.

Date to take effect: 2020-2021 Academic Year

MontanaTech *Curriculum Change Request Form Dated 6 September 2019*

APPROVALS

Department Head Approval _____ **Date** 4/9/2020

Dean Approval _____ **Date** _____

Graduate Council Approval David Hood _____ Date 4/20/20

CRC Approval _____ Date _____

Faculty Senate Approval _____ Date _____

VCAA Approval (see below) _____ Date _____

Chancellor Approval (see below) _____ Date _____

LEVEL of Request

Please indicate the type of request(s) by selecting *all that apply*:

Faculty Approvals (directly to CRC, then Faculty Senate):

- ✓ Establish a new course for the catalog (please contact the Registrar of MUS CCN information)
- ☐ Changed course: addition, deletion or change of title, credit, course number, pre-req, description, or cross listing.
- ☐ Amend an existing degree program. Making changes to programs such as adding a writing course to a major, changing the list of accepted electives or removing a requirement of a minor
- ☐ New degree certification program of 29 credits or less
- ☐ Other:

Campus Approvals (must be approved by the VCAA prior to CRC submission):

- ☐ Placing a postsecondary educational program into moratorium
- ☐ Withdrawing a postsecondary educational program from moratorium
- ☐ Establishing, re-titling, terminating or revising a campus certificate of 29 credits or more
- ☐ Establishing a B.A.S./A.A./A.S. area of study
- ☐ Offering an existing postsecondary educational program via distance or online delivery
- ☐ Other:

OCHE Approvals *(must be approved by the VCAA and Chancellor prior to CRC submission)*:

- ☐ Re-titling an existing postsecondary educational program
- ☐ Terminating an existing postsecondary educational program
- ☐ Consolidating existing postsecondary educational programs
- ☐ Establishing a new minor where there is a major or an option in a major
- ☐ Revising a postsecondary educational program
- ☐ Establishing a temporary C.A.S. or A.A.S. degree program Approval limited to 2 years
- ☐ Other:

Level II *(must be approved by the VCAA and Chancellor prior to CRC submission)*:

- ☐ Establishing a new postsecondary educational program
- ☐ Exceeding the 120 credit maximum for baccalaureate degrees Exception to policy 301.11
- ☐ Forming, eliminating or consolidating an academic, administrative, or research unit
- ☐ Re-titling an academic, administrative, or research unit
- ☐ Other:

MontanaTech *Curriculum Change Request Form Dated 6 September 2019*

Date 04/07/2020
Dept. Mechanical Engineering **College** **School of Mines and Engineering (SME)**
Program Mechanical Engineering **CRC Representative:** Peter Lucon

Description of Request: Product Development has been taught for three semesters as a 491 class. It is currently a professional elective, and we would like to create a permanent course designation. It is envisioned that this course will transition from a professional elective to a required course in the ME curriculum in the future.

Current Course or Program Information: Current overall curriculum has 136 credits. No changes to the curriculum other than a course number change at this time.

Product Development - 36311 - EMEC 491 - 01

3.000 Credits
View Catalog Entry
Proceed to the Montana Tech Bookstore

Scheduled Meeting Times

Type Time	Days Where	Date Range	Schedule Type	Instructors
Class 9:00 am - 9:50 am	MWF SCIENCE AND ENGR. BLDG. 308	Jan 06, 2020 - May 01, 2020	Lecture	Peter Andrew Lucon (P)

The course would be a 3XX course, because it should be taken before senior design and after the sophomore level prerequisites.

Proposed Change

Course # Name	**Credits**	**Pre-req.**
EMEC 3XX Product Development	**3**	**EGEN 202 – Dynamics & EMEC 215 Intro Model**

Course Description: This course covers the aspects of product design. The calculation methodology of the mathematically-computed engineering calculations will be presented. Definition and analysis of safety factors, tolerances, stress and knockdown factors will be presented. MathCAD, Microsoft Word, and Solidworks will be heavily used throughout the course, as well as Microsoft PowerPoint, MATLAB, and ANSYS. A course project focused on the design of a product will be required, and the groups are required to present their design through multiple engineering reviews.

Course Learning Outcomes:
This course provides students with education in the following outcomes set forth by The Accreditation Board of Engineering and Technology (ABET):
(1) an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
(3) an ability to communicate effectively with a range of audiences
(5) an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
(6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

List of supporting documentation attached:

1. **Syllabus**
2. **Revised Curriculum Worksheet listing course as a professional elective with an actual course number**

Assessment Leading to Request

The course has been taught for three semesters as a 491 class and it is time to assign a course number to this class. The course has been well received by the students. It is structured to prepare students for the real world and better equip them to be successful as professionals.

Anticipated Impacts to "Other" Programs

None. The class has only been taken by Mechanical Engineering Students.

Impact on Library: No consultation is required since changes are only in the course number, course name, or course pre-requisites.

Date to take effect: Fall 2020

MontanaTech *Curriculum Change Request Form Dated 6 September 2019*

APPROVALS

Department Head Approval _____ **Date** 4/9/2020

Dean Approval _____ **Date** _____

Graduate Council Approval _____ Date _____

CRC Approval David Hood _____ Date 4/20/20

Faculty Senate Approval _____ Date _____

VCAA Approval (see below) _____ Date _____

Chancellor Approval (see below) _____ Date _____

LEVEL of Request

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- ☐ New degree certification program of 29 credits or less
- ☐ Other:

Campus Approvals (must be approved by the VCAA prior to CRC submission):

- ☐ Placing a postsecondary educational program into moratorium
- ☐ Withdrawing a postsecondary educational program from moratorium
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- ☐ Other:

OCHE Approvals *(must be approved by the VCAA and Chancellor prior to CRC submission)*:

- ☐ Re-titling an existing postsecondary educational program
- ☐ Terminating an existing postsecondary educational program
- ☐ Consolidating existing postsecondary educational programs
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- ☐ Revising a postsecondary educational program
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Level II *(must be approved by the VCAA and Chancellor prior to CRC submission)*:

- ☐ Establishing a new postsecondary educational program
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- ☐ Re-titling an academic, administrative, or research unit
- ☐ Other:

MontanaTech *Curriculum Change Request Form Dated 6 September 2019*

EMEC 491/591 – Product Development

MWF 9:00 AM – 9:50 AM
Science and Engineering Building, Room 308

Instructor: Dr. Peter Lucon plucon@mtech.edu 406-496-4886
Science & Engineering Building, Room 312

Office hours: M 2:00 PM – 5:00 PM
W By appointment only

Designation: Professional Elective – Mechanical Engineering Programs

CRNs: 36311 and 36424

Prerequisites: EGEN 202 – Engineering Mech – Dynamics

Course (Catalog) Description: EMEC 491/591. This course covers the aspects of product design. The calculation methodology of the mathematically computed engineering calculations will be presented. Definition and analysis of safety factor, tolerances, stress and knockdown factors will be presented. MathCAD, Microsoft Word, and Solidworks will be heavily used throughout the course, as well as Microsoft PowerPoint, MATLAB, and ANSYS. A product will be designed as a project for the course and the groups are required to present their design through multiple engineering reviews.

Course Outcomes: This course provides students with education in the following outcomes set forth by The Accreditation Board of Engineering and Technology (ABET):
(1) an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
(3) an ability to communicate effectively with a range of audiences
(5) an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
(6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

Course Goal: For students to understand the fundamentals of modeling and design of mechanical systems to perform engineering tasks.

Contribution to Professional Component: Engineering topics – 3 credits

Textbook: **Required:** Product Design and Development, By Ulrich, Eppinger, Ulrich, Karl, Eppinger, Steven: Published by Mcgraw-Hill Higher Education

Optional: Mechanical Engineering Design. by Budynas, Richard, Nisbett, Keith, Budynas, Richard G., and Nisbett, Keith J. Mcgraw-Hill [2014], 10th Edition.

Contribution to Professional Component: Engineering topics – 3 credits

Prepared by: Dr. Peter Lucon **Date:** Jan 5, 2020

Academic Integrity: Academic dishonesty will not be tolerated. For a detailed description of academic integrity, including definitions of copying and plagiarism, see p. 15-16 of the Montana Tech Student Handbook. If you have questions about actions that violate the academic integrity policy, *ask* before you engage.

If academic dishonesty is suspected, it will be reported to the Office of the Vice Chancellor for Academic Affairs and could potentially result in an "F" for the project/exam or the course or expulsion.

Method of Contact: Please contact me via e-mail to ask questions, schedule an appointment or stop by during my scheduled office hours.

Technology Policy: Computers, cell phones, tablets, etc. will *only* be used to enhance the learning experience in class at times designated by the instructor. Do not check your email, texts, social media, etc. during lecture.

Accommodations: Students requiring reasonable accommodation for a documented disability should contact Amy Lorang, Montana Tech North Campus Disability Services Coordinator (x4429, alorang@mtech.edu@mtech.edu). Please inform the instructor of the course of any documented disabilities as soon as possible.

Inclusivity: Students in this course represent a rich variety of backgrounds and perspectives. I am committed to providing an atmosphere for learning that respects diversity, and therefore ask all students to:

a) share their unique experiences, values and beliefs;
b) be open to the views of others;
c) honor the uniqueness of their colleagues;
d) appreciate the opportunity that we have to learn from each other;
e) value each other's opinions and communicate respectfully.

[adapted from Cornell's CTE]

Evacuation: In case of a fire or other emergency, the class will calmly evacuate to Assembly Area 1 (South side of Park Street near Leonard Field by the handrail).

Grading Scale:

Grade	**-**		**+**
A		90 – 100	
B	80 – 83	83 – 87	87 – 90
C	70 – 73	73 – 77	77 – 80
D	60 – 63	63 – 67	67 – 70
F		< 60	

Assessments:

	Frequency	***Value***
Project Report	Semester	15 %
Homework	By topic	25 %
Project Homework/Notebook	By topic	15 %
Team Participation	Semester	15 %
Project Reviews	3 per Semester	30 %

Project: A project and project groups will be assigned during the first 2 weeks of class. Sections of the project will be performed during the entire semester in addition to the homework assignments. Projects will be performed groups of ~5, with a final report written up by the group. The project will be turned in as a final report for the work performed during the semester. Three project reviews will be given during the semester. (EMEC 591 students will have an additional project task and will be required to write a provisional patent for their groups design.) A project notebook (OneNote) will be worth 10% of the class, so it is critical the notebook is kept current throughout the semester. There will be no exams in this class. But the final exam time will be used for the final project review.

Homework: Problem sets will cover one or two topics, involve material from lectures and reading, and introduce new concepts. The homework assignments will be due in class the following class period and no late homework will be accepted. You can expect homework and project homework sets to be difficult and take between 3-6 hours per week. You are welcome to work in teams, but every participant must turn in their own solutions for the homework. Project homework will be turned in as a team. In addition, you must show all your work and clearly mark the answer to receive full credit for a problem. A homework template will be handed out the first week of class and is required to be used throughout the semester. Homework grades will not be curved.

Project Report: A final printed project report is due at the final project design review and will be reviewed with the group during the Final Exam on April 27th. A grading rubric will be provided midway through the semester.

Team Participation: Team participation will be assessed after each of the design reviews for team member participation. If members are not performing, unreliable, or counterproductive they may lose all 15 percentage points.

Important dates:

Jan 06	Mon	First day of class
Jan 20	Mon	MLK Day (No Class)
Jan 27	Mon	Last day to withdraw without W
Feb 17	Mon	Presidents Day (No Class)
Mar 14 – 22		Spring Break
Mar 24	Tue	Last day to withdraw with W
Apr 23	Thu	TechXpo
April 27	Mon	Final Exam (11:30 a.m. – 1:30 p.m.)

Topics Covered:

1. Design Life Cycle
2. Ethics and Documentation
3. Project Definition, Team Assignments, and Team
4. How to work on a team
5. Requirements (Product, Functional, Engineering)
6. Technical Writing and Presenting
7. Safety Factor
8. Stress and Knockdown Factors
9. Design Reviews (Initial, Mid, and Final)
10. Working with Vendors
11. Mature Engineering (Check Answers, Check Design)
12. CAD Best Practices (Start Parts, Templates, and Parts)
13. Tolerances
14. CAD Best Practices (Assemblies)
15. CAD Rendering (Best Practices)
16. CAD Drawing (Template and Basics)
17. CAD Drawings (How to Read, Check, Weld Callouts)
18. Dimensioning (ISO and GD&T)
19. FEA (Basics, Von-Mises Stress)
20. FEA (Static vs. Dynamic)
21. FEA (Fatigue Analysis)
22. Drawing Package for Release
23. Testing and Statistical Significance, Trouble Shooting
24. Product Design Cycle Full Picture

Note: The topics covered and their order are subject to change during the semester.

MontanaTech *Curriculum Change Request Form Dated 6 September 2019*

Date March 31, 2020
Dept. *Metallurgical and Materials Engineering* ***College*** *School of Mines and Engineering*
Program *B.S. in Met. and Mat'ls Engrg.* ***CRC Representative*** *Dr. Avimanyu Das*

Description of Request: The M&ME Department faculty request modification of its B.S. degree curriculum that entails removal of 15 credits of courses required under the current curriculum and addition of two 3-credit courses, addition of 1 credit to an existing 2-credit course, and requirement of 6 credits of "restricted engineering electives." The names of two courses (EMET 232 and 234) will be changed to "Process Engineering Fundamentals" and "Process Engineering Laboratory: to reflect subject matter and EMET 233, which increases from 2 to 3 credits, and EMET 235, the associated laboratory course, will both be raised to the 300 level. Following the modifications, the total credit requirement will be 132 credits. **NOTE:** EMET 232 and 234 are required for the Mining Engineering B.S. degree and for the Mining Option in Geological Engineering. The content, scheduling and availability of these courses will not be altered; only the course names will be changed. The Mining Engineering and Geological Engineering catalog listings will be updated to show the new course names.

Current Course or Program Information: The B.S.M&ME program curriculum (Table 1) defined in the current catalog requires a minimum of 136 credits for graduation.

Proposed Changes

Course # Name	Credits	Comments
Remove EMET 294 – Workshop	-1.0	Workshop to be incorporated in EMAT 230)
Remove EMET 350 – Transport Phenomenon	-3.0	EMET 340 is sufficient
Remove EMET 380 – M&ME Safety & Health	-1.0	Subject matter covered in other core courses
Remove EMET 451 - Process Instrumentation & Control	-3.0	EMET 451 retained as an M&ME elective
Remove EGEN 325 – Engineering Economics	- 3.0	Add to list of Restricted Engrg.. Electives
Remove EGEN 305/306 or EGEN 335/336 requirement	- 4.0	Add to list of Restricted Engrg.. Electives
Add EMAT 230 – Materials & the Human Experience	+3.0	Creating a new introductory course
Add EMAT 420 – Phys. Chem. of Iron & Steelmaking	+3.0	Currently exists as a popular elective course
Add 1 credit to EMET 233 – Mineral Processing & Design	+1.0	Change course number to 300-level
EMET 235 – Mineral Processing & Design Lab	0.0 (no change)	Change course numbers to 300-level
Add 4 credits of electives	+4.0	To meet electives as defined below

Electives

9 credits restricted to EMAT, EMET or courses for a minor in a STEM discipline at MTU (must be 300, 400 or 500 level)
6 credits of restricted engineering electives (EELE 201, EGEN 305, EGEN 325, or EGEN 335)
6 credits of free STEM electives (must be 200 level or higher in any STEM discipline at MTU).

New Course: EMAT 230 – Materials and the Human Experience

Credits: 3 lecture
Prerequisite: CHMY 141
Course description: The course begins by providing a historical perspective of the parallels between materials development and the advancement of civilization, traces the discoveries and improvements in materials/technologies, and culminates with discussion of recent materials innovations and emerging technologies. Interrelationships between the structure, properties, processing, performance, and characterization of metals, ceramics, polymers, and composite materials are emphasized. Guest lectures and field trips to materials laboratories and operations are an integral part of the course.
Learning outcomes: On completion of this course, the student will be able to:

- describe the fundamental characteristics of the main types of materials (metals, ceramics, polymers, and composites)
- account for the relationship between the structure and properties of the various materials
- understand the relationships between materials processing and the resulting properties and performance
- understand the relevance and importance of characterization in the evolution of materials systems

List of supporting documentation attached:

1. EMET 230 Syllabus (new course)
2. EMET 233 and EMET 235 Syllabi (reflecting increase from 2 to 3 credits in EMET 233 and elevation to 300-level for both courses)
3. Statement of rationale for changes
4. Table 1. Current Curriculum for Bachelor of Science Degree in Metallurgical and Materials Engineering
5. Table 2. Proposed Curriculum for Bachelor of Science Degree in Metallurgical and Materials Engineering

(Note: affected courses are highlighted in Table 1 and Table 2)

Assessment Leading to Request

The Department Head reviewed the curricula of five other universities that purport to emphasize extractive metallurgy and that of the top-rated materials engineering programs in the U.S. The modifications are recommended to ensure that our process metallurgy exceed those of the competition, the materials engineering offerings are comparable to those of nationally ranked institutions, and that we continue to provide our students with a strong background in fundamental engineering courses.

Anticipated Impacts to "Other" Programs

None.

Impact on Library: None.

Date to take effect: *Fall 2020*

Montana Tech *Curriculum Change Request Form Dated 6 September 2019*

APPROVALS

Department Head Approval Jerome P. Downey **Date** 4/7/2020

Dean Approval Dan Trudnowski **Date** 4/8/2020

Graduate Council Approval _____ Date _____

CRC Approval David Hood Date 4/19/20

Faculty Senate Approval _____ Date _____

VCAA Approval (see below) _____ Date _____

Chancellor Approval (see below) _____ Date _____

LEVEL of Request

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- ☐ Other:

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- ☐ Re-titling an existing postsecondary educational program
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MontanaTech *Curriculum Change Request Form Dated 6 September 2019*

Date March 31, 2020
Dept. *Metallurgical and Materials Engineering* ***College*** *School of Mines and Engineering*
Program *B.S. in Met. and Mat'ls Engrg.* ***CRC Representative*** *Dr. Avimanyu Das*

Description of Request: The M&ME Department faculty requests modification of the prerequisites for several of its EMAT course s.

Current Course or Program Information: Each of the EMAT courses is offered as a required course, as an elective in the Bachelor of Science in M&ME, or as a graduate course. The proposed changes are requested to eliminate unnecessary, redundant, and/or inconsistent prerequisite courses.

Proposed Changes

Course # and Name	**Credits**	**Current Prerequisite(s)**
EMAT 575-Biomaterials	3	Instructor's consent
EMAT 570-Mech. Behavior of Mat'ls	3	Senior or graduate standing and instructor's consent
EMAT 569-Failure Analysis & Des. Life	3	Senior or graduate standing and instructor's consent
EMAT 475-Corrosion	3	EMET 307
EMAT 472-Mat'l Engrg & Design	2	EMAT 351 or instructor's consent
Course # and Name	**Credits**	**Proposed Prerequiste(s)**
EMAT 575-Biomaterials	3	Senior or graduate standing & EMAT 251 or EGEN 213, or instructor consent
EMAT 570-Mech. Behavior of Mat'ls	3	Senior or graduate standing & EMAT 251 or EGEN 213, or instructor consent
EMAT 569-Failure Analysis & Des. Life	3	Senior or graduate standing & EMAT 251 or EGEN 213, or instructor consent
EMAT 475-Corrosion	3	CHMY 141 & EMAT 251 or EGEN 213, or instructor's consent
EMAT 472-Mat'l Engrg & Design	2	EMAT 251 or EGEN 213, or instructor's consent

List of supporting documentation attached:
None – only minor modification to the course syllabi are necessary

Assessment Leading to Request
The Instructor and Department Head reviewed determined that some prerequisites listed for certain EMAT courses were confusing and unnecessary and, therefore, deterred students majoring in other fields from taking them as technical electives.

Anticipated Impacts to "Other" Programs
None. The proposed changes are intended to make the specified EMAT courses available as electives to students majoring in other STEM disciplines.

Impact on Library: None.

Date to take effect: *Fall 2020*

Montana Tech *Curriculum Change Request Form Dated 6 September 2019*

APPROVALS

Department Head Approval

Jerome P. Downey ***Date*** 4/7/2020

Dean Approval

Dan Trudnowski ***Date*** 4/8/2020

Graduate Council Approval _____ Date _____

CRC Approval David Hood Date 4/19/20

Faculty Senate Approval _____ Date _____

VCAA Approval (see below) _____ Date _____

Chancellor Approval (see below) _____ Date _____

LEVEL of Request

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Montana Tech *Curriculum Change Request Form Dated 6 September 2019*

Protocol: The department requesting a curriculum change holds a discussion at the departmental level, and if agreed upon, the Department Chair, elevates the request to the Dean for approval. All changes to the catalog require CRC approval.

Forward the completed form along with supporting information to the CRC chair after approval from the department chair, dean, and graduate council if necessary. Please email a word file and remember to check the request level found on the signature page. The signature page can be a PDF or bring the original with signatures to the meeting and state in the email that you are doing so.

New courses require course outcomes. Please contact the registrar before submitting a CRC request for a new course to evaluate the use of the common course numbering system. If numbers are pending, it is acceptable to use the XX notation (i.e. OSH 2XX).

Final changes will be made by the registrar after senate approval.

Guidance can be found: https://www.umt.edu/provost/faculty/curriculum/default.php.

Montana Tech *Curriculum Change Request Form Dated 6 September 2019*

Date 03/08/20
Dept. Petroleum Engineering **College** SME
Program BS Petroleum Engineering **CRC Representative:** Sue Schrader

Description of Request:

- The changes on the new curriculum plan include both changing the order of several courses and the changes being submitted in other Curriculum Change Requests, which are:
  - Replace PET 307 Petroleum Production Lab I with newly created PET 207 Petroleum Computer Fundamentals Lab
  - Replace GEOE 357 Subsurface Methods in Petroleum Geology (canceled by Geological Engineering Department) with GEOE 403 Structural Geology for Engineers)
- Remove GEOE 357 Subsurface Methods in Petroleum Geology from core course listing and add GEOE 403 Structural Geology for Engineers as a core course.

Current Course or Program Information: The current curriculum plan lists the course as they have been offered through this spring semester (2019-2020 academic year).

Proposed Change

Course # Name	Credits	Pre-req.

Remove canceled course GEOE 357 Subsurface Methods in Petroleum Geology from spring semester sophomore year and add GEOE 403 Structural Geology for Engineers to spring semester junior year.

Remove canceled course GEOE 357 Subsurface Methods in Petroleum Geology from the core course listing for Petroleum Engineering and add GEOE 403 Structural Geology for Engineers to the list of core courses that must be taken at Montana Tech.

Remove canceled course PET 307 Petroleum Production Lab I from spring semester junior year and add newly created PET 207 Petroleum Computer Fundamentals Lab spring semester sophomore year.

Move Social Science elective from spring semester freshman year to spring semester sophomore year.

List of supporting documentation attached:

1. 2019-2020 Petroleum Engineering Curriculum Worksheet
2. 2020-2021 Petroleum Engineering Curriculum Worksheet

Assessment Leading to Request

These changes accommodate changed course offerings in the Geological and Petroleum Engineering Departments.

Anticipated Impacts to "Other" Programs

There will be increased enrollment in the GEOE 403 Structural Geology for Engineers course.

Impact on Library: None.

Date to take effect: 05/01/20

Montana Tech *Curriculum Change Request Form Dated 6 September 2019*

APPROVALS

Department Head Approval _____ **Date** _____

Dean Approval _____ **Date** _____

Graduate Council Approval _____ Date _____

CRC Approval _David Hood _____ Date __4/19/20_____

Faculty Senate Approval _____ Date _____

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- ☐ Establishing, re-titling, terminating or revising a campus certificate of 29 credits or more
- ☐ Establishing a B.A.S./A.A./A.S. area of study
- ☐ Offering an existing postsecondary educational program via distance or online delivery
- ☐ Other:

OCHE Approvals *(must be approved by the VCAA and Chancellor prior to CRC submission)*:

- ☐ Re-titling an existing postsecondary educational program
- ☐ Terminating an existing postsecondary educational program
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- ☐ Other:

Level II *(must be approved by the VCAA and Chancellor prior to CRC submission)*:

- ☐ Establishing a new postsecondary educational program
- ☐ Exceeding the 120 credit maximum for baccalaureate degrees Exception to policy 301.11
- ☐ Forming, eliminating or consolidating an academic, administrative, or research unit
- ☐ Re-titling an academic, administrative, or research unit
- ☐ Other:

Montana Tech *Curriculum Change Request Form Dated 6 September 2019*

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New courses require course outcomes. Please contact the registrar before submitting a CRC request for a new course to evaluate the use of the common course numbering system. If numbers are pending, it is acceptable to use the XX notation (i.e. OSH 2XX).

Final changes will be made by the registrar after senate approval.

Guidance can be found: https://www.umt.edu/provost/faculty/curriculum/default.php.

Montana Tech *Curriculum Change Request Form Dated 6 September 2019*

Date 03/xx/2020
Dept. Petroleum **College** SME
Program **CRC Representative: Susan Schrader**

Description of Request: Create a new course titled "Pet 207 – Petroleum Computer Fundamentals Lab"

Current Course or Program Information:

Prerequisite(s): PET 201, EGEN 101

Proposed Change

Course # Name	Credits	Pre-req.
Pet 207 – Petroleum Computer Fundamentals **Lab**	**1**	**PET 201, EGEN 101**

Design, implementation and use of Petroleum Engineering software. The course covers a variety of topics, including software design and implementation, numerical precision, quality control and reporting of results, and an introduction to data analytics. Software platforms used include Excel, Visual Basic, and Python, and Orange.

List of supporting documentation attached:

1. **Syllabus**
2. **Curriculum worksheet**

Assessment Leading to Request
Input for alumni and our Industrial Advisory Board strongly suggest the need for this course content.

Anticipated Impacts to "Other" Programs
None

Impact on Library: No consultation is required since no additional library content is needed.

Date to take effect: 7/1/2020

Montana Tech *Curriculum Change Request Form Dated 6 September 2019*

APPROVALS

Department Head Approval _____ **Date** _____

Dean Approval _____ **Date** _____

Graduate Council Approval _____ Date _____

CRC Approval ___David Hood _____ Date ___4/19/20__

Faculty Senate Approval _____ Date _____

VCAA Approval (see below) _____ Date _____

Chancellor Approval (see below) _____ Date _____

LEVEL of Request

Please indicate the type of request(s) by selecting *all that apply*:

Faculty Approvals (directly to CRC, then Faculty Senate):

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Campus Approvals (must be approved by the VCAA prior to CRC submission):

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New courses require course outcomes. Please contact the registrar before submitting a CRC request for a new course to evaluate the use of the common course numbering system. If numbers are pending, it is acceptable to use the XX notation (i.e. OSH 2XX).

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MontanaTech *Curriculum Change Request Form Dated 6 September 2019*

Date 03/10/20
Dept. Petroleum Engineering
Program BS Petroleum Engineering

College SME
CRC Representative: Sue Schrader

Description of Request: Add PET 225 – Presentation and Professionalism as a Pre-requisite for Pet 348 – Petroleum Well Logging

Current Course or Program Information:
2019-20 Course Catalog Description: Interpretation of open hole logging tools, including electrical, nuclear, and sonic devices will be studied. Also, a review of basic cased hole logging tools will be conducted. Included in the study will be the operating theories, log presentations, computation methods for basic reservoir properties, and the use of practical log examples and methods.
Prerequisites: GEO 257, PET 301, 304, PHSX 237.

Proposed Change

Course # Name	Credits	Pre-req.
Pet 348 – Petroleum Well Logging	**3**	**GEO 257, PET 225, PET 301, PET 304 and PHSX 237**
Interpretation of open hole logging tools, including electrical, nuclear, and sonic devices will be studied. Also, a review of basic cased hole logging tools will be conducted. Included in the study will be the operating theories, log presentations, computation methods for basic reservoir properties, and the use of practical log examples and methods.		

List of supporting documentation attached:
None.

Assessment Leading to Request
The students give presentations during the semester; however, the quality of the presentations seems to be predicated on whether they have completed the PET 225 – Presentation and Professionalism course. It would benefit the students and improve their presentations if they complete the PET 225 course prior to taking PET 348.

Anticipated Impacts to "Other" Programs
None.

Impact on Library: None.

Date to take effect: 7/1/2020

Montana Tech *Curriculum Change Request Form Dated 6 September 2019*

APPROVALS

Department Head Approval _____ **Date** 3/18/2020

Dean Approval _____ **Date** _3/18/2020_

Graduate Council Approval David Hood **Date** 4/19/20

CRC Approval _____ **Date** _____

Faculty Senate Approval _____ **Date** _____

VCAA Approval (see below) _____ **Date** _____

Chancellor Approval (see below) _____ **Date** _____

LEVEL of Request

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- ☐ Other:

OCHE Approvals *(must be approved by the VCAA and Chancellor prior to CRC submission)*:

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Level II *(must be approved by the VCAA and Chancellor prior to CRC submission)*:

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MontanaTech *Curriculum Change Request Form Dated 6 September 2019*

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MontanaTech *Curriculum Change Request Form Dated 6 September 2019*

Date 03/10/20
Dept. Petroleum Engineering
Program BS Petroleum Engineering

College SME
CRC Representative: Sue Schrader

Description of Request: Change prerequisite from GEOE 457/357 to GEOE 403 for PET 426.

Current Course or Program Information:
2019-20 Course Catalog Description Reservoir analysis using concepts and data from traditional reservoir engineering, geology, hydrology, petrophysics, geophysics and geostatistics. The tools necessary to obtain a quantitative model of the reservoir are developed. Prerequisite(s): PET 404, GEOE 457, PET 348, and PET 410.

Proposed Change

Course # Name	Credits	Pre-req.
Pet 426 – Reservoir Characterization	**3**	**GEOE 403, PET 348, PET 404, and PET 410**

Reservoir analysis using concepts and data from traditional reservoir engineering, geology, hydrology, petrophysics, geophysics and geostatistics. The tools necessary to obtain a quantitative model of the reservoir are developed.

List of supporting documentation attached:
None.

Assessment Leading to Request
Curriculum change in Geological Engineering. PET 426 previously required GEOE 357/457 as a prerequisite. This class no longer exists and GEOE 403 will be offered in it's place.

Anticipated Impacts to "Other" Programs
Geological Engineering

Impact on Library: None.

Date to take effect: 7/1/2020

Montana Tech *Curriculum Change Request Form Dated 6 September 2019*

APPROVALS

Department Head Approval _____ Date 3/18/2020

Dean Approval _____ Date _3/18/2020_

Graduate Council Approval _____ Date _____

CRC Approval David Hood Date 4/19/20

Faculty Senate Approval _____ Date _____

VCAA Approval (see below) _____ Date _____

Chancellor Approval (see below) _____ Date _____

LEVEL of Request

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MontanaTech *Curriculum Change Request Form Dated 6 September 2019*

Date 03/xx/2020
Dept. Petroleum **College** SME
Program **CRC Representative: Susan Schrader**

Description of Request: Change name of Pet 453 – Petroleum Production II Lab

Current Course or Program Information: The physical properties of gas, including natural gas, are measured using fundamental analysis techniques. Laboratory exercises include measurement of specific gravity, BTU content, molecular composition, and water content. Systems for metering of flow rates and measurement of gas characteristics are studied. Laboratory reports are required.

Prerequisite(s): PET 307, PET 372.

Proposed Change

Course # Name	Credits	Pre-req.
of Pet **453** – Petroleum Production **Lab**	**3**	**PET 307, PET 372**

The physical properties of gas, including natural gas, are measured using fundamental analysis techniques. Laboratory exercises include measurement of specific gravity, BTU content, molecular composition, and water content. Systems for metering of flow rates and measurement of gas characteristics are studied. Laboratory reports are required.

List of supporting documentation attached:

1. **Curriculum worksheet**

Assessment Leading to Request

This course represents the combined content of Production Lab I and Production Lab II. Since the courses have been combined, there is no reason for designating the labs with the Roman numeral I and II.

Anticipated Impacts to "Other" Programs

None

Impact on Library: No consultation is required since changes are only in the course name.

Date to take effect: 7/1/2020

Montana Tech *Curriculum Change Request Form Dated 6 September 2019*

APPROVALS

Department Head Approval _____ **Date** _____

Dean Approval _____ **Date** _____

Graduate Council Approval _____ Date _____

CRC Approval __David Hood _____ Date ____4/19/20_____

Faculty Senate Approval _____ Date _____

VCAA Approval (see below) _____ Date _____

Chancellor Approval (see below) _____ Date _____

LEVEL of Request

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