Faculty Senate Agenda
4/12/24
4 p.m.
Mill 201

I. Welcome and minutes
   a. Review of 3/15/24 minutes

Action Items

II. Emeriti / Emeritae Requests
   a. Jensen
   b. Reiten
   c. Vuke
   d. Conrad

III. CRC Requests
   a. Masters of Project Engineering and Management (3/7)
   b. Civil Engineering (3/7)
   c. Computer Science (3/7)
   d. Geological Engineering – BS (3/7)
   e. Software Engineering (3/7)
   f. Geological Engineering – BS (4/1)
   g. Geological Engineering – MS (4/1)
   h. Geological Engineering – UAV (4/1)
   i. Automotive Technology – AAS and Spring AAS (4/1)
   j. Pre-Apprentice Line (4/1)
   k. Biological Sciences (4/1)

IV. Research Faculty and Staff Procedures – Committee selection

Informational Items

V. Departmental Senator Elections (or Reelections) for:
   Business -
   Chemistry – John Kirtley (2024-2026)
   Writing – Glen Southergill (2024-2027)
   Trades – Jason Herndon (2024-2026)
   Computer Science, Cybersecurity, & Network Administration – Doug Galarus (2024-2026)
   Electrical Engineering - Bryce Hill (2024-2026)
   Environmental Engineering –
   Research Faculty (non-MBMG) – Gary Wyss (2024-2026)

Discussion Items

VI. Spring 2024 Faculty Survey – Previous survey
   https://mtech.edu/facultystaff/facultysenate/surveys/index.html

VII. For the Good of the Order

Faculty Senate Minutes
3/15/24
4 p.m.
Mill 201

Senators in attendance: D. Autenrieth, C. Young, C. Gammons, M. Haynes, C. Faught, A. Mitra, A. Traut, R. LaDouceur, B. Hill, G. Wallace, S. Juskiewicz, G. Wyss, M., Egloff, S. Rosenthal, J. Kirtley

I. Welcome and minutes – A motion was made to approve the minutes. That motion was seconded and passed without discussion.

Action Items

II. CRC – None Provided

III. Research Faculty and Staff Policy and Procedures (moved from 2/16 meeting) was discussed. A motion was made to endorse the interim policy (not the procedures). That motion was seconded and then discussed. The motion passed. The procedures portion of the document was then discussed. A motion was made to form a committee consisting of 2 faculty Senators, 2 who are affected, and the VCR. The motion was seconded. The motion passed without further discussion. Senators are asked to let an Officer know if they want to serve on the committee by Friday, March 22nd.

IV. Accreditation Visit April 15th through 17th was discussed.

Discussion Items

V. The Spring 2024 Faculty Survey was discussed. Senators were asked to review the previous two faculty surveys and to bring feedback back to the Senate's next meeting.

Link to Previous survey https://mtech.edu/facultystaff/facultysenate/surveys/index.html

VI. The Full Faculty Meeting was discussed and the date and time will be announced at a later date. Items to be discussed include:
a. Proposal to add Employee Relations and Confidence Committee to Handbook.
b. Campus plans (classroom, labs, and offices) for Main and Engineering Hall Remodels
c. Accreditation Visit – Meetings involving faculty

VII. Departmental Elections/Reelections will occur for the following departments:
a. Business
b. Chemistry
c. Writing
d. Trades
e. Computer Science, Cybersecurity, & Network Administration
f. Electrical Engineering
g. Environmental Engineering

VIII. The meeting adjourned at 4:41pm

Date

ITEM NNN-NNNN-RNNNN

Authorization to Confer the Title of Professor Emeritus of Safety, Health and Industrial Hygiene; Montana Technological University

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THAT

Upon the occasion of the retirement of Dr. Roger C. Jensen from the faculty of Montana Technological University, the faculty wishes to express its appreciation for his years of dedicated and valued service to the institution, the Department of Safety, Health and Industrial Hygiene, and the state of Montana by recommending the rank of Professor Emeritus in the Department of Safety, Health and Industrial Hygiene be conferred upon him by the Board of Regents of the Montana University System.

EXPLANATION

Professor Jensen earned his B.S. in Mechanical and Industrial Engineering at the University of Utah in 1969, his J.D. from Salmon P. Chase Law School at Northern Kentucky State in 1974, his M.S. in Industrial and Operations Engineering at the University of Michigan in 1977, and his Ph.D. in Industrial Engineering from West Virginia University in 1989. In addition, Dr. Jensen has earned professional certifications through the Board of Professional Ergonomists and the Board of Certified Safety Professionals. While living in Ohio, he achieved the status of Registered Attorney and Registered Professional Engineer.

From 1968 through 1991, Dr. Jensen served as a Commissioned Officer with the U.S. Public Health Service Commissioned Corps, assigned to the National Institute for Occupational Safety and Health (NIOSH), retiring as a Captain. During his tenure with NIOSH, Dr. Jensen served in numerous roles including development of new lines of research into occupational injury prevention. Dr. Jensen was invited to serve as a visiting lecturer at the University of New South Wales Department of Safety Science in 1991 where he taught courses in Ergonomics, Management for Safety, and Machines and Structures Safety. Upon his return to the U.S., Dr. Jensen was a Senior Ergonomist with UES, Inc, and became Director of their Applied Science and Engineering Division in 1998.

Dr. Jensen came to Montana Tech as an Assistant Professor in the Safety, Health and Industrial Hygiene Department in 1999. He was promoted to Associate Professor in 2002 and to Professor in 2006. Dr. Jensen has developed and taught classes in the Department's degree programs, specifically Fire Protection, Safety Lab, Risk Reduction Methods, Law & Ethics for OSH, Safety Engineering and Technology, and Systems Safety and Process Safety Management. In addition, Dr. Jensen administered Montana Tech's Training Project Grant from the National Institute for Occupational Safety and Health from 2000 to 2014. Dr. Jensen was also instrumental in establishing the Safety Lab in the Natural Resource Research Center which substantially increased the capacity for active learning and applied research activities. Finally, Dr. Jensen played a critical role in obtaining and maintaining ANSAC/ABET accreditation of the Department degree programs.

Dr. Jensen's research portfolio includes two books and nearly 100 publications within respectable journals. Dr. Jensen's unparalleled ability to mentor students of all levels through the research process is evidenced by his bibliography identifying countless student authors. Dr. Jensen is considered a world-renowned expert in research topics such as risk assessment matrices, ergonomics, safety signage, stairway safety, and fall protection. Recent honors include Fellow of the American Society of Safety Professionals and Montana Tech Distinguished Researcher award in 2023. Roger published the second edition of his textbook, *Risk-Reduction Methods for Occupational Safety and Health*, in 2019. In addition, Dr. Jensen recently served as a guest editor for the International Journal for Environmental Research and Public Health. Dr. Jensen has also served on the Advisory Board of the Rocky Mountain Center for Occupational and Environmental Health at the University of Utah since 2003.

Dr. Jensen's tenure at Montana Tech can be characterized as outstanding with significant service to the University and to the State for which he is to be commended. For these and numerous other contributions, the Department of Safety, Health and Industrial Hygiene are honored to nominate Dr. Roger Jensen for the rank of Professor Emeritus of Safety, Health and Industrial Hygiene at Montana Technological University.

January 22, 2019

ITEM # XXX

Request for authorization to confer the title of Professor Emeritus on Jon Reiten – Montana Bureau of Mines and Geology - Montana Technological University

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THAT

Upon the occasion of the retirement of Bureau Professional Practice Professor Jon Reiten from the Montana Bureau of Mines and Geology, Montana Tech, the faculty wishes to express its appreciation for his 38 years of dedication and valued service by requesting the rank of Professor Emeritus be conferred upon him by the Board of Regents of Higher Education.

EXPLANATION

Jon Reiten earned his B.Sc. in Geology in 1973 from the University of North Dakota and his M.S. in Geology from the University of North Dakota in 1983.

Jon was a Hydrologist for the North Dakota State Water Commission from 1980-1985 and joined the Montana Bureau of Mines and Geology in 1985 and served as a Bureau Professional Practice Faculty (BPPF) Assistant Professor (Hydrogeologist) until 1995 when he was promoted to BPPF Associate Professor (Hydrogeologist). He was award BPPF Professor (Hydrogeologist) in 2004.

Jon is widely recognized as a long-term expert on eastern Montana geology and hydrogeology. His work has been used to establish long-standing water management plans in northeast Montana where water shortages are routine and water rights contentious. He worked with land owners, conservation districts, Federal agencies, and State agencies for more than 38 years..

Jon Reiten has authored or co-authored (most often as first author) nearly 40 MBMG publications as well as several peer-reviewed publications related to eastern Montana; he has served on numerous advisory committees including as a Governor appointee to the Montana Board of Environmental Review. Jon held decadal membership on several associations including the American Water Resources Association, the National Ground Water Association, and the Montana Geologic Society. Our knowledge of the hydrogeology and geology of eastern Montana has advanced far under Jon's dedication and passion for good science.

Based on his accomplishments in research and service to the state of Montana, the Montana Bureau of Mines and Geology of Montana Tech is pleased to nominate Bureau Professional Practice Professor Jon Reiten as Professor Emeritus of the Montana Bureau of Mines and Geology at Montana Technological University together with all the rights, privileges, and honors thereto appertaining.

January 22, 2019

ITEM # XXX

Request for authorization to confer the title of Professor Emeritus on Susan Vuke – Montana Bureau of Mines and Geology - Montana Technological University

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THAT

Upon the occasion of the retirement of Bureau Professional Practice Professor Susan Vuke from the Montana Bureau of Mines and Geology, Montana Tech, the faculty wishes to express its appreciation for her 33 years of dedication and valued service by requesting the rank of Professor Emeritus be conferred upon her by the Board of Regents of Higher Education.

EXPLANATION

Susan Vuke earned her B.A. in Geology in 1972 from

Indiana University and her M.S. in Geology from the University of Montana, Missoula in 1981.

Susan came to the Montana Bureau of Mines and Geology in 1981 and served as a Bureau Professional Practice Faculty (BPPF) Assistant Professor (Geologist) until 2005 when she was promoted to BPPF Associate Professor (Geologist). She was award BPPF Professor (Geologist) in 2014.

The MBMG Geologic Mapping Program owes much of its success to Susan's knowledge of Montana geology; her efforts helped establish the MBMG as a routine leader in national competitive grant awards for geologic mapping for the past 33 years.

Susan Vuke exemplifies the standard of geologic research, program management, and mentorship. The praise she receives from her colleagues within the Bureau, throughout Montana and neighboring states is many and varied. She has authored or co-authored (most often as first author) more than 100 MBMG publications as well as several peer-reviewed publications; Susan was lead author on the Geologic Map of Montana published in 2007 – the first revision of the map since 1953. Our knowledge of the geology of Montana has advanced far under Susan's dedication and passion for good science.

Based on his accomplishments in research and service to the state of Montana, the Montana Bureau of Mines and Geology of Montana Tech is pleased to nominate Bureau Professional Practice Professor Susan Vuke as Professor Emeritus of the Montana Bureau of Mines and Geology at Montana Technological University together with all the rights, privileges, and honors thereto appertaining.

MONTANA
TECHNOLOGICAL UNIVERSITY

8 April 2024

Subject: Nomination of Dr. Paul Conrad for Professor Emeritus rank

The Mining Engineering Department of Montana Tech, consisting of Dr. Thomas Camm P.E., Professor, Dr. Abhishek Choudhury P.E., Associate Professor, Mr. Chris Roos P.E., Assistant Professor and Dr. Scott Rosenthal P.E., Associate Professor and Department Head, wish to nominate Dr. Paul Conrad as Professor Emeritus of Mining Engineering at Montana Tech together with all the rights, privileges, and honors thereto appertaining.

Dr. Paul Conrad grew up in Pennsylvania, and after a short stint in an underground coal mine driving shuttle car, decided a degree in engineering would be a better life path. Dr. Conrad was a first-generation college graduate when he completed his BS in Mining Engineering at Pennsylvania State University in 1982. Dr. Conrad's first work experience was focused on highways and civil engineering projects. Somewhere along the way, Dr. Conrad decided he needed to earn his MS which he also completed at Pennsylvania State University in 1990. Upon graduation, Dr. Conrad worked on engineering projects as a consultant.

Dr. Conrad completed his Mining Engineering PhD in 2002 at the University of Kentucky where he conducted research on the Starfire High Quality Tree Reforestation Project. Dr. Conrad started his career at Montana Tech in 2003 as Assistant Professor Mining Engineering. Promotion to Associate Professor occurred in 2007 and to Professor in 2013. Dr. Conrad is a Registered Professional Engineer in the state of Pennsylvania and a long-time member of the Society for Mining, Metallurgy and Exploration (SME), especially active in the Coal & Energy Division. The Practical Underground Mining class in the Underground Mine Research Center was first established by Dr. Conrad. Dr. Conrad was a key link in the articulation agreement and transfer of British Columbia Institute of Technology (BCIT) students to Montana Tech.

Dr. Conrad dedicated and served a distinguished 21-year career at Montana Tech. For the first 10 years of his academic career, Dr. Conrad saw near continual turnover in the Mining Engineering Department. Dr. Conrad led recruitment, and was invaluable in helping the current faculty settle in, leading to a long period of zero faculty turnover in the department.

Sincerely,

Scott Rosenthal, Ph.D., P.E.
Associate Professor and Department Chair, Mine Engineering

MontanaTech *Curriculum Change Request Form Dated December 23, 2022*

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.

Final changes are made by the registrar after faculty senate approval and BOR approval, as needed.
See workflow document
https://helpx.adobe.com/acrobat/how-to/convert-word-excel-paper-pdf-forms.html?set=acrobat--fundamentals--pdf-forms
Guidance can be found at: https://mus.edu/che/arsa/academicproposals.html

Submission Requirements: All Submissions (checked by CRC):

- ☐ Electronic Copy (with the exception of signatures- no handwritten items)
- ☐ Completed CRC Form, with all Signatures and Attachments based on level of request (see below)
- ☐ Naming Convention as determined by CRC

LEVEL of Request

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

1. *Faculty Approvals (directly to CRC, then Faculty Senate):*
   - ■ Establish a new course for the catalog (please contact the Registrar of MUS CCN information) Required Documents:
     - ☐ Course Number
     - ☐ Course Outcomes
     - ☐ Course Description
     - ☐ Syllabus
     - ☐ Curriculum Worksheet
     - ☐ Pre-requisite or co-requisite
   - ■ Course Changes: addition, deletion or change of title, credit, course number, pre-req, description, or cross listing. Required Documents:
     - ■ Course Number
     - ☐ Course Outcomes
     - ☐ Course Description
     - ☐ Syllabus
     - ☐ Pre-requisites or co-requisites
     - ☐ Existing Curriculum Worksheet
     - ☐ New Curriculum Worksheet, with changes highlighted
   - ■ 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. Required Documents:
     - ☐ **Documents as listed under establishing a new course (as applicable)**
     - ☐ Existing Curriculum Worksheet
     - ☐ New Curriculum Worksheet, with changes highlighted
   - ☐ Other (for those that are considered in this level but otherwise not listed):

     _____

2. *Campus Approvals Level I (must be approved by the VCAA prior to CRC submission):*
   - ☐ Placing a postsecondary educational program into moratorium: Required Documents:
     - ☐ Program Termination and Moratorium Form
     - ☐ Academic Proposal Request Form
   - ☐ Withdrawing a postsecondary educational program from moratorium. Required Documents:
     - ☐ Academic Proposal Request Form

- ☐ Establishing, re-titling, terminating or revising a campus certificate of 29 credits or fewer. Required Documents:
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Establishing a B.A.S./A.A./A.S. area of study. Required Documents:
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Offering an existing postsecondary educational program via distance or online delivery. Required Documents:
  - ☐ Academic Proposal Request Form

3. OCHE Approvals Level I *(must be approved by the VCAA and Chancellor prior to CRC submission)*:
Level I items are those requests for which the Board of Regents has fully designated approval authority to the institution or Commissioner of Higher Education. These requests are to be submitted for notification to or approval by Commissioner as Level I proposals. Level I proposals may be submitted to OCHE at any time by the flagship campuses or community colleges and will be processed on a rolling monthly schedule. The approval of such proposals will be conveyed to the Board of Regents at the next meeting of the board. Level I proposals include campus initiatives typically characterized by minimal costs, clear adherence to approved campus mission, and the absence of significant programmatic impact on other institutions within the MUS and community colleges. BOR Forms can be found using the following link:
https://mus.edu/che/arsa/Forms/AcademicForms.html

- ☐ Re-titling an existing postsecondary educational program. Required Documents:
  - ☐ Academic Proposal Request Form
- ☐ Terminating an existing postsecondary educational program.
  - ☐ Academic Proposal Request Form
  - ☐ Program Termination and Moratorium Form
- ☐ Consolidating existing postsecondary educational programs
  - ☐ Academic Proposal Request Form
  - ☐ Curriculum Proposal Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Establishing a new minor where there is a major or an option in a major
  - ☐ Academic Proposal Request Form
  - ☐ Curriculum Proposal Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Revising a postsecondary educational program
  - ☐ Curriculum Proposal Form
  - ☐ Academic Proposal Request Form
- ☐ Establishing a temporary C.A.S. or A.A.S. degree program Approval limited to 2 years
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**

4. Level II *(must be approved by the VCAA and Chancellor prior to CRC submission)*:
Level II proposals require initial approval and comment by the Board of Regents through a Request to Plan prior to final review and approval by the Office of the Commissioner of Higher Education. These proposals entail more substantive additions to, alterations in, or termination of programs, structures, or administrative or academic entities typically characterized by the (a) addition, reassignment, or elimination or personnel, facilities, or courses of instruction; (b) rearrangement of budgets, cost centers, funding sources; and (c) changes which by implication could impact other MUS institutions and community colleges.

- ☐ Establishing a new postsecondary educational program

- ☐ Request to Plan (RTP)
- ☐ Academic Proposal Request Form
- ☐ Curriculum Proposal
- ☐ Fiscal Analysis Form
- ☐ Completed Intent to Plan Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Permanent authorization for a temporary C.A.S. or A.A.S degree program

- ☐ Academic Proposal Request Form
- ☐ C.A.S/A.A.S Curriculum Proposal
- ☐ Fiscal Analysis Form
- ☐ Completed Intent to Plan Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Exceeding the 120 credit maximum for baccalaureate degrees Exception to policy 301.11

- ☐ Academic Proposal Request Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Forming, eliminating or consolidating an academic, administrative, or research unit

- ☐ Academic Proposal Request Form
- ☐ Curriculum or Center/Institute Proposal
- ☐ Completed Request to Plan, except when eliminating or consolidating
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Re-titling an academic, administrative, or research unit Permanent authorization for a temporary C.A.S. or A.A.S degree program

☐ Curriculum Proposal

☐ Completed Intent to Plan Form

MontanaTech *Curriculum Change Request Form Dated December 23, 2022*

Date 10/23/23
Dept. MPEM **College** Graduate
Program MPEM **CRC Representative** _____

Description of Request: _(1) course numbers: reduce from 4 digit to 3 digits by dropping the last zero for all courses, e.g. MPEM 5010 ==> MPEM 501
(2) change course name and description for 1 course, and add 2 new courses
(3) change the core courses and elective courses required for the degree

Current Course or Program Information: _____

Number (Assigned By CRC): _____
Proposed Change

Course #	Name	Credits	Pre-req.
(see attachments)			

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

List of supporting documentation attached (See Level of Request for Requirements):

Assessment Leading to Request

MPEM to formally allow broader course options to align with current practices.
Corporate partners are looking for programs that their employees can upgrade skills while working.

Anticipated Impacts to "Other" Programs

Other programs can offer elective courses to the MPEM program

Impact on Library: No Impact has consulted with _____ 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 (note that the earliest date is the next calendar year): Fal l2024

APPROVALS

Department Head Approval Todd Hoffman
Date 10/23/23

Dean Approval Angela Lusking
Date 2/27/24

Graduate Council Approval
Date 2/26/2024

CRC Approval
Date 3/7/24

Faculty Senate Approval
Date _____

VCAA Approval (see below)
Date _____

Chancellor Approval (see below)
Date _____

(1) course numbers: reduce from 4 digit to 3 digits by dropping the last zero for all courses,

List of courses with current numbering:

- MPEM 5010 - Entrepreneurship & Economic Feasibility (Core)
- MPEM 5020 - Project & Engineering Management (Core)
- MPEM 5030 - Legal Issues Related To MPEM (Core)
- MPEM 5040 - Financial Management Of Technological Enterprises (Core)
- MPEM 5050 - Management, Economics, & Accounting (Core)
- MPEM 5060 - Advanced Management Seminar (Core)
- MPEM 5100 - Pollution Prevention (Elective)
- MPEM 5110 - Energy Conversion (Elective)
- MPEM 5120 - Application & Design Of Industrial Experiments (Elective)
- MPEM 5130 - Hazardous Waste Engineering (Elective)
- MPEM 5140 - Systems Safety & Management (Elective)
- MPEM 5150 - Information Technology for Managers (Elective)
- MPEM 5160 - Managerial Communication For Project Managers (Elective)
- MPEM 5900 - Special Projects

List of courses with proposed numbering:

- MPEM 501 - Entrepreneurship & Economic Feasibility (Core)
- MPEM 502 - Project & Engineering Management (Core)
- MPEM 503 - Legal Issues Related To MPEM (Core)
- MPEM 504 - Financial Management Of Technological Enterprises (Core)
- MPEM 505 - Management, Economics, & Accounting (Core)
- MPEM 506 - Advanced Management Seminar (Core)
- MPEM 510 - Pollution Prevention (Elective)
- MPEM 511 - Energy Conversion (Elective)
- MPEM 512 - Application & Design Of Industrial Experiments (Elective)
- MPEM 513 - Hazardous Waste Engineering (Elective)
- MPEM 514 - Systems Safety & Management (Elective)
- MPEM 515 - Information Technology for Managers (Elective)
- MPEM 516 - Managerial Communication For Project Managers (Elective)
- MPEM 590 - Special Projects

(2) change the course name and description for 1 course, and add 2 new course

List of current course names and descriptions:

MPEM 5030 - Legal Issues Related To MPEM (Core)

3 credits (Hrs: 3 Lec.)

This course evaluates processes involved in patents, contracts. The course also will include management regulations related to project engineering, and regulations related to environmental issues.

(GRADUATE) Course offered on demand.

List of proposed new course names and descriptions:

MPEM 503 - Laws, Regulations & Risk Management (Core)

3 credits (Hrs: 3 Lec.)

This class teaches a general understanding of the laws governing engineering projects including an emphasis on ethical, professional, environmental and liability issues. The class includes a review of risks associated with contract, tort and intellectual property laws germane to project management and includes instruction on how to protect and minimize such risks through risk analysis and insurance agreements.

(GRADUATE) Course offered on demand.

Proposed new course:

MPEM 521 - Final Project Design (Core)

3 credits (Hrs: 3 Lec.)

Individual projects suitable for graduate study are completed. Students create project management structure and submit written and oral reports for the project.

Prerequisite(s): Graduating Semester & Consent of instructor. **(GRADUATE)** Course offered on demand.

MPEM 518 - US Energy Policy & Energy for Sustainability (Elective)

3 credits (Hrs: 3 Lec.)

This course involves the principles of energy production, the technologies involved, and the resources required. The course analyzes the engineering principles, the how US energy policy changes, and 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 impacts and community benefits in a more realistic manner.

(GRADUATE) Course offered on demand.

(3) change the core courses and elective courses required for the degree

Existing Curriculum Worksheet:

Student ID:_____
Student Name:_____
Adviser Name:_____
Catalog: 2023-2024 Catalog
Program: Project, Engineering and Management (Web-Based Master's), M.
Minimum Credits Required:_____

Project, Engineering and Management (Web-Based Master's), M.

Department Head: Dr. Kumar Ganesan
(406) 496-4239
SE 316B

Field of Study

The Master of Project Engineering and Management degree is designed to give working professionals an opportunity to enhance their technical and managerial skills with minimum disruption to their workday. The 30 credit non-thesis degree is structured around three primary areas: 1) Advanced Engineering Principles; 2) Industrial and Management Engineering; and 3) Business and Organizational Management.

Degree Program

All the courses for this unique, interdisciplinary degree program are offered through web-based, on-line courses. All courses are three credits each for a total of 30 semester credits. A student is required to have a Bachelor of Science Degree or technical degree to gain admission in this graduate degree program. Students with non-engineering (technical degree) may be required to take additional courses as prerequisites. Admission into the program will be evaluated based on individual applicants educational background and work experience.

This online courses allows students to coordinate their study with their professional and personal demands. This internet based offering allows students to pursue studies at times and places convenient to them.

Curriculum

This 30 credit, non-thesis degree is structured around technical management as the focus. Courses are offered during fall, spring, and summer semesters. The MPEM course work includes **six core courses and four technical electives. It also includes a final project presentation to the committee members to complete the degree requirements. This presentation will take place on campus.**

Core Courses (Three credits each)– Required of All Students

Course Name Credits Term Taken Grade Gen Ed
MPEM 5010 - Entrepreneurship & Economic Feasibility (Core) *3 credits*
MPEM 5020 - Project & Engineering Management (Core) *3 credits*
MPEM 5030 - Legal Issues Related To MPEM (Core) *3 credits*
MPEM 5040 - Financial Management Of Technological Enterprises (Core) *3 credits*
MPEM 5050 - Management, Economics, & Accounting (Core) *3 credits*
MPEM 5060 - Advanced Management Seminar (Core) *3 credits*
MPEM 5900 - Special Projects *(Variable)*

Elective Courses (Three credits each)– Students complete any four courses

Course Name Credits Term Taken Grade Gen Ed
MPEM 5100 - Pollution Prevention (Elective) *3 credits*
MPEM 5110 - Energy Conversion (Elective) *3 credits*
MPEM 5120 - Application & Design Of Industrial Experiments (Elective) *3 credits*
MPEM 5130 - Hazardous Waste Engineering (Elective) *3 credits*
MPEM 5140 - Systems Safety & Management (Elective) *3 credits*
MPEM 5150 - Information Technology for Managers (Elective) *3 credits*
MPEM 5160 - Managerial Communication For Project Managers (Elective) *3 credits*

Admission Requirements:

1. Applicants must have a Bachelor's Degree in any Engineering discipline.
2. Non-engineering students wishing to enroll may have to complete some engineering deficiency courses.
3. Applicants interested in the program should apply to Montana Tech (406) 496-4304.

Proposed New Curriculum Worksheet:

Student ID:_____
Student Name:_____
Adviser Name:_____
Catalog: 2024-2025 Catalog
Program: Masters of Project Engineering and Management (MPEM)
Minimum Credits Required:_____

Masters of Project Engineering and Management (MPEM)

Department Head: Dr. B. Todd Hoffman
(406) 496-4753
NRB 350

Field of Study

The Master of Project Engineering and Management degree is designed to give working professionals an opportunity to enhance their technical and managerial skills with minimum disruption to their workday. The 30 credit non-thesis degree is structured around three primary areas: 1) Advanced Engineering Principles; 2) Industrial and Management Engineering; and 3) Business and Organizational Management.

Degree Program

All the courses for this unique, interdisciplinary degree program are offered through web-based, on-line courses. All courses are three credits each for a total of 30 semester credits. A student is required to have a Bachelor of Science Degree or technical degree to gain admission in this graduate degree program. Students with non-engineering (technical degree) may be required to take additional courses as prerequisites. Admission into the program will be evaluated based on individual applicants educational background and work experience.

This online courses allows students to coordinate their study with their professional and personal demands. This internet based offering allows students to pursue studies at times and places convenient to them.

Curriculum

This 30 credit, non-thesis degree is structured around technical management as the focus. Courses are offered during fall, spring, and summer semesters. The MPEM course work includes **four core courses and six technical electives. One of the core courses includes a final capstone course to complete the degree requirements. The technical electives can include 400 or 500 level online courses in MPEM, Business, Environmental, Petroleum, Mining, Industrial Hygiene, Civil, Mechanical, Restoration, Sustainability, Data Analytics, Hydrological, Geological, or similar programs.**

Core Courses (Three credits each)– Required of All Students

Course Name Credits Term Taken Grade Gen Ed
MPEM 501 - Entrepreneurship & Economic Feasibility (Core) *3 credits*
MPEM 502 - Project & Engineering Management (Core) *3 credits*
MPEM 503 - Laws, Regulations & Risk Management (Core) *3 credits*
MPEM 521 - Final Project Design (Core) *3 credits*

Elective Courses (Three credits each)–

Students complete six 400- or 500-level courses from MPEM, business, engineering, or other technical disciplines.

The MPEM elective are listed below. Other discipline courses are listed in the representative departments.

Course Name Credits Term Taken Grade Gen Ed
MPEM 504 - Financial Management of Technological Enterprises (Core) *3 credits*
MPEM 505 - Management, Economics, & Accounting (Core) *3 credits*
MPEM 506 - Advanced Management Seminar (Core) *3 credits*
MPEM 510 - Pollution Prevention (Elective) *3 credits*
MPEM 511 - Energy Conversion (Elective) *3 credits*
MPEM 512 - Application & Design of Industrial Experiments (Elective) *3 credits*
MPEM 513 - Hazardous Waste Engineering (Elective) *3 credits*
MPEM 514 - Systems Safety & Management (Elective) *3 credits*
MPEM 515 - Information Technology for Managers (Elective) *3 credits*
MPEM 516 - Managerial Communication for Project Managers (Elective) *3 credits*
MPEM 518 - US Energy Policy & Energy for Sustainability (Elective) *3 credits*

Admission Requirements:

1. Applicants must have a Bachelor's Degree. A B.S in Engineering or equivalent technical experience is recommended.
2. Non-engineering students wishing to enroll may have to complete deficiency courses.
3. Applicants interested in the program should apply to Montana Tech (406) 496-4304.

MPEM 518 – US Energy Policy & Energy for Sustainability

Instructor: Dave Rathgeber
NRB 348
drathgeber@mtech.edu
(406) 496-4810

Description: This course involves the principles of energy production, the technologies involved, and the resources required. The course analyzes the engineering principles, the how US energy policy changes, and 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 impacts and community benefits in a more realistic manner.

Outcomes: Students will develop a foundation of energy literacy, patterns, and trends. In addition, students will understand the fundamentals of energy related to physics, engineering, and economics. Students will learn about energy technologies in the three primary energy sectors – buildings, electricity, and transportation. Additionally, students will learn of GHG emissions from the industrial and agriculture sectors. Students will be able to understand energy policy and planning, and how it affects public policy, and consumer and investor interest.

Textbooks: Energy for Sustainability, Second Edition – John Randolph, Gilbert Masters *(Optional)*
How the World Really Works: The Science Behind How We Got Here and Where We're Going – Vaclav Smil *(Optional)*
How to Avoid a Climate Disaster: The Solutions We Have and the Breakthroughs We Need – Bill Gates *(Optional)*
Unsettled: What Climate Science Tells Us, What It Doesn't, and Why It Matters – Steven E. Koonin *(Optional)*
What Really Causes Global Warming? – Peter Langdon Ward *(Optional)*
Apocalypse Never: Why Environmental Alarmism Hurts us All – Michael Shellenberger *(Optional)*

References: papers and readings -as needed

Grading:

8-10 HWs	200 pts
Participation	100 pts
Midterm	100 pts
Final	100 pts
Total	500 pts

90-100	A
80-89	B
70-79	C
60-69	D
0-59	F

The +/- system is used.

Policies: (1) Lectures and assignments will be posted weekly on Moodle and/or Microsoft Teams
(2) Communication will be via Microsoft Teams and email, on an as-needed basis. Students will be expected to check in periodically via Teams meeting. Weekly live Teams meetings will be broadcast, recorded and accessible for those who cannot attend at predetermined time.
(3) Academic dishonesty will not be tolerated.

Office Hours: via Zoom by appointment (including evenings and weekends if needed). Please email us to set up times.

Final Exam: tbd

Course Outline **(subject to change)**

Week of	**Topic**	**Assignment**
May 30th	The Global "Crisis"	
June 5th	The Basics of Energy	
June 12th	Energy Sources – Coal, Oil/Gas, Solar, Wind, Nuclear	
June 19th	The Energy Life Cycle -Energy Efficiency	
June 26th	Midterm	
July 3rd	Climate Science	
July 10th	Defining "Sustainable" Energy and the Future of Our Energy Supply - US EPA	
July 17th	Global Emissions Policies, EPA Emissions Calculations, and Mitigating Techniques	
July 24th	The aim for "Net-Zero" buildings – US EPA	
July 31st	Final Exam	

Academic dishonesty will not be tolerated in this class. You will receive a zero on any assignments if you cheat and may receive an "F" for the course. Working together is encouraged, however, you need to complete and submit assignments on you own.

You are responsible for reading and understanding the Syllabus. Students will abide by all school and departmental requirements concerning COVID-19. Masks are required in buildings and classrooms while on campus.

Accommodations for Students with Disabilities: Students with disabilities who believe they may need accommodations in this class are encouraged to contact a Montana Tech Disability Services Coordinator (DSC) at 496-4429. For any student who may need an accommodation due to a disability, please make an appointment to see me. A letter from a Montana Tech Disability Coordinator authorizing your accommodations is needed.

MONTANA
TECHNOLOGICAL UNIVERSITY

Laws, Regulations & Risk Management – Online
MPEM 5030

GENERAL SYLLABUS –

Instructor: Samm Cox, J.D.
Office: ELC 323
Office Hours: 9:30-10:30 pm T, W & TR or by appointment.
Phone: 406-496-4820 **Email: scox@mtech.edu**

Required Textbooks: None at this time
Required Materials and Aids: Supplemental materials will be utilized in this course. Access to a computer is an obvious necessity in this online course.
Credits: 3
Prerequisites: none
Course Start/End Date:
Course Location/Days/Times: Online via Moodle/Canvas

A. COURSE DESCRIPTION

This graduate-level class will equip engineering professionals with essential knowledge and skills related to legal aspects in project management. We'll explore how legal considerations impact engineering projects, covering topics such as contracts, liability, and risk management.

B. COURSE CONTENT

Unit 1: Introduction to Legal Frameworks

- Understanding the legal system and its relevance to engineering projects.
- Contract law: Types of contracts, key clauses, and their implications.
- Tort and negligence law: Responsibilities, liabilities, and risk mitigation.

Unit 2: Contractual Relationships

- Examining relationships between project stakeholders (owners, contractors, subcontractors, etc.).
- Legal obligations, rights, and dispute resolution mechanisms.
- Drafting Effective Contracts to Minimize Legal Exposure

Unit 3: Product Liability and Engineering

- Product development and liability: Navigating legal challenges.
- Design flaws, construction defects and accidents
- An engineer's Duty of Care and Professional Responsibility
- Case studies: Real-world examples of engineering-related lawsuits.

Unit 4: Risk Management and Legal Compliance

- Identifying project risks and legal implications.
- Understanding Insurance policies in engineering projects
- Balancing Legal Requirements with Ethical Obligations
- Legal Evidence and Record Keeping
- Compliance with industry standards, regulations, and codes.

Unit 5: Communication Skills for Engineers

- Effective communication with legal professionals, clients, and other stakeholders.
- Interview techniques to identify project-related legal issues.

C. COURSE OUTCOMES

Upon completion of this course, the student will be able to:

- Understand the legal landscape affecting engineering projects.
- Analyze contracts and assess legal risks.
- Communicate effectively across technical and legal domains.
- Apply legal principles to project management scenarios.

D. GRADING

In general, there will be a Quiz for every Unit and a Final Exam. Quizzes will be worth 50 to 100 points and the Final Exam will be 100 points. In addition, there will be points for Assignments and Case Briefs which will vary as the semester proceeds. It is important to understand that there is no weighted grading and each point for an assignment is as important as a point for a quiz or exam answer.

(The Legal Caveat) The instructor may change the assigned material or grade weighting at any time change is considered necessary and for any reason at the discretion of the instructor.

E. READINGS/ASSIGNMENTS/QUIZZES

NOTE: This is a graduate level class. You need to manage your own time in this class. You need to note the dates that each unit's activities are due and you are responsible for keeping up in a timely fashion. If additional time is needed to complete the Unit, please contact the instructor as this class is set up for you to work at your own pace. However, the most important date is the date of the Final Exam as there can be no extensions granted beyond that point.

F. CLASS PARTICIPATION

Being taught online, there is limited participation but rather your success in this course will depend in large measure on the interest, willingness, and enthusiasm that you bring to the experience. It is set up for you to learn on your own at a pace which is best for you understanding the various time constraints.

G. STUDENT RESOURCES

As your instructor, I will be available to student inquiries and will respond within a reasonable timespan. Please know that I will always use my Montana Tech email and your Montana Tech email when communicating with you.

In addition to my availability, here are many other resources available to you as a student at Montana Tech. Those resources can be found online at the Montana Tech Digger Central Website link.

H. EXTRA CREDIT

There is ample opportunity to increase your overall grade in the event that you don't do well on one exam. As a result, **extra credit assignments are unnecessary and are not given**.

F. SYLLABUS CHANGES

It is highly possible that circumstances may require changes in the syllabus. Students are hereby notified that such changes may occur.

G. WITHDRAWAL FROM THE COURSE

The last day to drop the course is
The last day to Withdraw from the class is

I. ACADEMIC DISHONESTY

Academic Dishonesty includes: 1) Aiding another student commit academic dishonesty; 2) Copying from the paper of another student while taking an examination; 3) Plagiarism; 4) Unauthorized signatures; 5) Using unlawful aids to pass an examination. Montana Tech.

J. STUDENTS WITH DISABILITIES

Students with disabilities who believe they may need accommodations in this class are encouraged to contact a Montana Tech Disability Services Coordinator (DSC) at either 496-4429 (North Campus) or 496-3730 (South Campus). Any student who may need an accommodation due to a disability, please make an appointment to see one of the Disability Services Coordinators during their office hours. A letter from a Montana Tech Disability Coordinator authorizing your accommodations is needed.

K. CLASS BEHAVIOR/EXPECTATIONS:

My expectation is that each student will log in to the course and complete some activity at least once weekly. Please let me reiterate: The dates listed in the

Reading/Quiz/Assignment Schedule are listed as "due no later than …" There is however some understanding as to the time constraints of a student so if you cannot complete the material by such date, it is incumbent upon you to contact the instructor. You are always allowed to work ahead as well.

L. ABOUT YOUR PROFESSOR

Samm Cox, J.D.

University of Montana*, School of Law* – Juris Doctor
Montana Tech 1992, B.S. Technology for Business Dev.
Attorney - Admitted to the bar to practice law, 1995
Admitted to the US Supreme Court, 1995
Deputy County Attorney Butte-Silver Bow 1995-2008
Chief Deputy Attorney Butte-Silver Bow 2008-2022

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.

Final changes are made by the registrar after faculty senate approval and BOR approval, as needed.
See workflow document
https://helpx.adobe.com/acrobat/how-to/convert-word-excel-paper-pdf-forms.html?set=acrobat--fundamentals--pdf-forms
Guidance can be found at: https://mus.edu/che/arsa/academicproposals.html

Submission Requirements: All Submissions (checked by CRC):

- ☐ Electronic Copy (with the exception of signatures- no handwritten items)
- ☐ Completed CRC Form, with all Signatures and Attachments based on level of request (see below)
- ☐ Naming Convention as determined by CRC

LEVEL of Request

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

1. *Faculty Approvals (directly to CRC, then Faculty Senate):*
   - ☐ Establish a new course for the catalog (please contact the Registrar of MUS CCN information) Required Documents:
     - ☐ Course Number
     - ☐ Course Outcomes
     - ☐ Course Description
     - ☐ Syllabus
     - ☐ Curriculum Worksheet
     - ☐ Pre-requisite or co-requisite
   - ■ Course Changes: addition, deletion or change of title, credit, course number, pre-req, description, or cross listing. Required Documents:
     - ■ Course Number
     - ■ Course Outcomes
     - ■ Course Description
     - ■ Syllabus
     - ■ Pre-requisites or co-requisites
     - ■ Existing Curriculum Worksheet
     - ■ New Curriculum Worksheet, with changes highlighted
   - ■ 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. Required Documents:
     - ■ **Documents as listed under establishing a new course (as applicable)**
     - ■ Existing Curriculum Worksheet
     - ■ New Curriculum Worksheet, with changes highlighted
   - ☐ Other (for those that are considered in this level but otherwise not listed):

     _____

2. *Campus Approvals Level I (must be approved by the VCAA prior to CRC submission):*
   - ☐ Placing a postsecondary educational program into moratorium: Required Documents:
     - ☐ Program Termination and Moratorium Form
     - ☐ Academic Proposal Request Form
   - ☐ Withdrawing a postsecondary educational program from moratorium. Required Documents:
     - ☐ Academic Proposal Request Form

- ☐ Establishing, re-titling, terminating or revising a campus certificate of 29 credits or fewer. Required Documents:
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Establishing a B.A.S./A.A./A.S. area of study. Required Documents:
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Offering an existing postsecondary educational program via distance or online delivery. Required Documents:
  - ☐ Academic Proposal Request Form

3. OCHE Approvals Level I *(must be approved by the VCAA and Chancellor prior to CRC submission)*:
Level I items are those requests for which the Board of Regents has fully designated approval authority to the institution or Commissioner of Higher Education. These requests are to be submitted for notification to or approval by Commissioner as Level I proposals. Level I proposals may be submitted to OCHE at any time by the flagship campuses or community colleges and will be processed on a rolling monthly schedule. The approval of such proposals will be conveyed to the Board of Regents at the next meeting of the board. Level I proposals include campus initiatives typically characterized by minimal costs, clear adherence to approved campus mission, and the absence of significant programmatic impact on other institutions within the MUS and community colleges. BOR Forms can be found using the following link:
https://mus.edu/che/arsa/Forms/AcademicForms.html

- ☐ Re-titling an existing postsecondary educational program. Required Documents:
  - ☐ Academic Proposal Request Form
- ☐ Terminating an existing postsecondary educational program.
  - ☐ Academic Proposal Request Form
  - ☐ Program Termination and Moratorium Form
- ☐ Consolidating existing postsecondary educational programs
  - ☐ Academic Proposal Request Form
  - ☐ Curriculum Proposal Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Establishing a new minor where there is a major or an option in a major
  - ☐ Academic Proposal Request Form
  - ☐ Curriculum Proposal Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Revising a postsecondary educational program
  - ☐ Curriculum Proposal Form
  - ☐ Academic Proposal Request Form
- ☐ Establishing a temporary C.A.S. or A.A.S. degree program Approval limited to 2 years
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**

4. Level II *(must be approved by the VCAA and Chancellor prior to CRC submission)*:
Level II proposals require initial approval and comment by the Board of Regents through a Request to Plan prior to final review and approval by the Office of the Commissioner of Higher Education. These proposals entail more substantive additions to, alterations in, or termination of programs, structures, or administrative or academic entities typically characterized by the (a) addition, reassignment, or elimination or personnel, facilities, or courses of instruction; (b) rearrangement of budgets, cost centers, funding sources; and (c) changes which by implication could impact other MUS institutions and community colleges.

- ☐ Establishing a new postsecondary educational program

- ☐ Request to Plan (RTP)
- ☐ Academic Proposal Request Form
- ☐ Curriculum Proposal
- ☐ Fiscal Analysis Form
- ☐ Completed Intent to Plan Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Permanent authorization for a temporary C.A.S. or A.A.S degree program

- ☐ Academic Proposal Request Form
- ☐ C.A.S/A.A.S Curriculum Proposal
- ☐ Fiscal Analysis Form
- ☐ Completed Intent to Plan Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Exceeding the 120 credit maximum for baccalaureate degrees Exception to policy 301.11

- ☐ Academic Proposal Request Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Forming, eliminating or consolidating an academic, administrative, or research unit

- ☐ Academic Proposal Request Form
- ☐ Curriculum or Center/Institute Proposal
- ☐ Completed Request to Plan, except when eliminating or consolidating
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Re-titling an academic, administrative, or research unit Permanent authorization for a temporary C.A.S. or A.A.S degree program

☐ Curriculum Proposal

☐ Completed Intent to Plan Form

MontanaTech *Curriculum Change Request Form Dated December 23, 2022*

Date 02/29/2024
Dept. Civil Engineering **College** LCME
Program Civil Engineering **CRC Representative** Dr. Liping Jiang

Description of Request: _____

1.Request to drop to 120 credits by adding,deleting, and changing sequences of existing civil courses. 2. request to update the ECIV499W course title to Civil Engineering Design and make this course a variable credit course (1-3cr).

Current Course or Program Information: _____

1.current curriculum has 128 credits. 2. current ECIV499W is a 1-credit course

Number (Assigned By CRC): _____

Proposed Change

Course #	Name	Credits	Pre-req.
ECIV 499W	Capstone: Civil Engineering Design	1-3	Senior Standing, Civil Engineering/Construction Management major, instructor's consent

Catalog Description:
Students will be able to partake in and complete a capstone engineering design that requires students to apply engineering principles to industry or C.E. department-sponsored projects that are selected by the instructor with the department head's approval. Students will be assigned to teams and contribute to engineering projects that require multiple constraints.

Student outcomes:
Successfully complete an engineering-related team project; explain basic concepts in project management, business, public policy, and leadership; explain basic concepts in leadership.

Prerequisite(s): Civil Engineering or Construction Management Major, Senior Standing, Instructor's consent

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

List of supporting documentation attached (See Level of Request for Requirements):

Assessment Leading to Request

The new curriculum covers fundamental topics in all five sub-disciplines in Civil Engineering Field. It aligns well with the mission of the CE program to prepare students for their professional licensure.

Anticipated Impacts to "Other" Programs

none

Impact on Library: _____ has consulted with _____ 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 (note that the earliest date is the next calendar year): 06/01/2024

APPROVALS

Department Head Approval _____

Date 02/29/2024

Dean Approval _____

Date 02/29/2024

Graduate Council Approval _____

Date _____

CRC Approval Tamara Harp

Date 03/07/2024

Faculty Senate Approval _____

Date _____

VCAA Approval (see below) _____

Date _____

Chancellor Approval (see below) _____

Date _____

Notes for CRC members:
1. Red: changes including adding existing courses, total credits changes, and "notes" update
2. Green: changing course sequences
3. Blue: updating existing courses

Civil Engineering, B.S.

Freshman

Fall Semester

Course Name	Credits	Math&Science	Engineering Topics	Communicatoins	Humanities	Social Sciences
CHMY 141 - College Chemistry I	3 credits	3				
CHMY 142 - College Chemistry Laboratory I	1 credit	1				
EGEN 101 - Introduction Engineering Calculations & Problem Solving	3 credits					
M 171 - Calculus I	3 credits	3				
EGEN 194 - Freshman Engineering Seminar	1 credit					
WRIT 121 - Introduction To Technical Writing	3 credits			3		
-OR-						
WRIT 101 - College Writing I	3 credits					
Total: 14						

Spring Semester

Course Name	Credits	Math&Science	Engineering Topics	Communicatoins	Humanities	Social Sciences
M 172 - Calculus II	3 credits	3				
GEO 101 - Introduction to Physical Geology	3 credits	3				
PHSX 234 - General Physics-Mechanics	3 credits	3				
Humanities Elective	3 credits				3	
ECIV102- Intro to Civil Eng & Construction Management	2 credits					
Total: 14						

Sophomore

Fall Semester

Course Name	Credits	Math&Science	Engineering Topics	Communicatoins	Humanities	Social Sciences
EGEN 201 - Engineering Mechanics–Statics	3 credits		3			
M 273 - Multivariable Calculus	4 credits	4				
ECIV210 Construction Materials	3 credits		3			
MIN210 Plane Surveying	3 credits					
ECNS 201 - Principles of Microeconomics	3 credits					3
-OR-						
ECNS 202 - Principles of Macroeconomics	3 credits					
-OR-						
ECNS 203 - Principles of Micro and Macro	3 credits					
Total: 16						

Spring Semester

Course Name	Credits	Math&Science	Engineering Topics	Communicatoins	Humanities	Social Sciences
EGEN 202 - Engineering Mech–Dynamics	3 credits		3			
M 274 - Introduction to Differential Equation	3 credits	3				
ECIV110 - Construction CAD	3 credits		3			
Social Science Elective	3 credits					3
Humanities Elective	3 credits				3	
Total: 15						

Junior

Fall Semester

Course Name	Credits	Math&Science	Engineering Topics	Communicatoins	Humanities	Social Sciences
ECIV306 Construction Engineering	3 credits		3			
EGEN305-Mechanics of Materials	3 credits		3			
EGEN306-Mechanics of Materials Laboratory	1 credit		1			
EGEN 335 - Fluid Mechanics	3 credits		3			
EGEN 336 - Fluid Mechanics Lab	1 credit		1			
Science Elective **	4 credits	4				
General Elective ***	3 credits					
Total: 18						

Spring Semester

ABET Requirements

General Education Requirements

Courses to Drop

Freshman Spring:

CHMY 143/OSH224/OSH226

Sophomore Fall:

PHSX235 & 236 General Physics – Heat, Sound & Optics & Lab
ECIV215 Intro to CE modeling
ECIV208 Construction Contracts

Sophomore Spring:

M333 Linear Algebra

ECIV225 CE Plans and Specification

ECIV307 Construction Bidding

Junior Fall:

ECIV407 Building Inspections

Junior Spring:

ECIV441 Structural Design Lab

Senior Fall:

ECIV302 Temporary Structures

ECIV432 Open Channel Lab
ECIV489W CE Design I – 2credits

Senior Spring:

ECIV405&408 Construction Project Planning &Lab
EENV460W Energy & Sustainability

Course Name	Credits					
EGEN 325 - Engineering Economic Analysis	*3 credits*		3			
STAT 332 - Statistics for Scientists and Engineers	*3 credits*	3				
ECIV 350 - Transportation Engineering	*3 credits*		3			
EENV403 Water & Wasterwater Treatment	*3 credits*		3			
General Elective ***	*3 credits*					
Total: 15						
Senior						
Fall Semester						
Course Name	**Credits**					
ECIV 486 - Soil Mechanics & Foundation Design	*3 credits*		3			
ECIV 312 - Structures I	*3 credits*		3			
ECIV 431 - Open Channel Hydraulics	*3 credits*		3			
WRIT 321W - Advanced Technical Writing	*3 credits*			3		
Professional Elective *	*3 credits*					
Total: 15						
Spring Semester						
Course Name	**Credits**					
ECIV 440 - Structural Design	*3 credits*		3			
Professional Elective *	*3 credits*					
ECIV 499W - Capstone: Civil Engineering Design	*3 credits*		3			
ECIV 443 - Hydraulic Structures (Or ECIV 543)	*3 credits*		3			
ECIV 458 - F.E. Review for Civil Engineers ****	*1credits*					
Total: 13		30	50	6	6	6
Minimum credits for a B.S. degree in Civil Engineering: 120						

Notes:
*Professional Elective: Civil Engineering , Construction Management course 300 level or higher (not required elsewhere in the curriculum)
**Science Elective: (PHSX235+PHSX236); (CHMY143+CHMY144); or (BIOB101+BIOB102).
***General Elective: any college-level course
****ECIV458 is a graduating semester only course.

Student ID:_____ **Catalog: 2023-2024 Catalog**
Student Name:_____ **Program: Civil Engineering, B.S.**
Adviser Name:_____ **Minimum Credits Required:**_____

Civil Engineering, B.S.

Freshman

Fall Semester

Course Name	Credits	Term Taken	Grade	Gen Ed
CHMY 141 - College Chemistry I	*3 credits*			
CHMY 142 - College Chemistry Laboratory I	*1 credit*			
EGEN 101 - Introduction Engineering Calculations & Problem Solving	*3 credits*			
M 171 - Calculus I	*3 credits*			
• Humanities Elective *3 credits*				
EGEN 194 - Freshman Engineering Seminar	*1 credit*			
WRIT 121 - Introduction To Technical Writing	*3 credits*			
-OR-				
WRIT 101 - College Writing I	*3 credits*			

Total: 17

Spring Semester

Course Name	Credits	Term Taken	Grade	Gen Ed
M 172 - Calculus II	*3 credits*			
GEO 101 - Introduction to Physical Geology	*3 credits*			
PHSX 234 - General Physics-Mechanics	*3 credits*			
• Humanities Elective *3 credits*				
CHMY 143 - College Chemistry II	*3 credits*			
-OR-				
OSH 224 - Safety and Health Occupations and Programs	*3 credits*			
-OR-				
OSH 226 - Safety Engineering & Technology	*3 credits*			

Total: 15

Sophomore

Fall Semester

Course Name	Credits	Term Taken	Grade	Gen Ed
EGEN 201 - Engineering Mechanics–Statics	*3 credits*			
M 273 - Multivariable Calculus	*4 credits*			
PHSX 235 - General Physics-Heat, Sound & Optics	*3 credits*			
PHSX 236 - General Phy-Heat, Sound & Optics Lab	*1 credit*			
ECIV 215 - Introduction to Modeling for Civil Engineers	*1 credit*			
ECIV 208 - Construction Contracts and Introduction to Construction Engineering	*3 credits*			
ECNS 201 - Principles of Microeconomics	*3 credits*			
-OR-				
ECNS 202 - Principles of Macroeconomics	*3 credits*			
-OR-				
ECNS 203 - Principles of Micro and Macro	*3 credits*			

Total: 18

Spring Semester

Course Name	Credits	Term Taken	Grade	Gen Ed
EGEN 202 - Engineering Mech–Dynamics	*3 credits*			
M 274 - Introduction to Differential Equation	*3 credits*			
M 333 - Matrices & Linear Algebra	*3 credits*			
ECIV 225 - Civil Engr Plans, Details, and Specifications	*3 credits*			
EGEN 305 - Mechanics of Materials (equiv 205)	*3 credits*			
ECIV 307 - Construction Bidding and Estimating	*3 credits*			

Total: 18

Junior

Fall Semester

Course Name	Credits	Term Taken	Grade	Gen Ed
WRIT 321W - Advanced Technical Writing	*3 credits*			
ECIV 312 - Structures I	*3 credits*			
EGEN 325 - Engineering Economic Analysis	*3 credits*			
ECIV 407 - Building Inspections	*3 credits*			
MIN 210 - Plane Surveying	*3 credits*			

Total: 15

Spring Semester

Course Name	Credits	Term Taken	Grade	Gen Ed
EGEN 306 - Mechanics of Materials Laboratory	*1 credit*			
STAT 332 - Statistics for Scientists and Engineers	*3 credits*			
EGEN 335 - Fluid Mechanics	*3 credits*			
EGEN 336 - Fluid Mechanics Lab	*1 credit*			
ECIV 350 - Transportation Engineering	*3 credits*			
ECIV 440 - Structural Design	*3 credits*			
ECIV 441 - Structural Design Lab	*1 credit*			

Total: 15

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 432 - Open Channel Hydraulics Lab	*1 credit*			
◆ Professional Elective *3 credits**				
ECIV 489W - Civil Engineering Design I	*2 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*			
ECIV 408 - Construction Project Planning and Scheduling Lab	*1 credit*			
ECIV 499W - Capstone: Civil Engineering Design II	*1 credit*			
ECIV 443 - Hydraulic Structures (Or ECIV 543)	*3 credits*			
EENV 460W - Energy & Sustainability	*3 credits*			
◆ Social Science Elective *3 credits*				
ECIV 458 - F.E. Review for Civil Engineers **	*1 credit*			

Total: 15

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

Notes:

* 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 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 the pre-requisites and co-requisites are otherwise met).
** ECIV 458 is a graduating semester only course.

Notes:

ECIV 499W – Civil Engineering Design

- Course Description: Students will be able to partake in and complete a capstone engineering design that requires students to apply engineering principles to industry or C.E. department-sponsored projects that are selected by the instructor with the department head's approval. Students will be assigned to teams and contribute to engineering projects that require multiple constraints.
- Course Objective: This course is aimed at providing students with guidance to complete civil engineering design projects; explain basic concepts in project management, business, public policy, and leadership; explain basic concepts in leadership.

  The student is expected to achieve;
  - 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, cultural, social, environmental, and economic factors
  - An ability to communicate effectively with a range of audiences
  - An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
  - 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
  - An ability to acquire and apply new knowledge as needed, using appropriate learning strategies
- Credits: 1 to 3 credits
- Prerequisites Civil Engineering/Construction Management Major, Senior Standing, Instructor's consent
- Time and Location: TBD
  TBD
- Textbook: *Handout*
- Instructors: Civil Engineering Faculty

- Course Grading:

Tentative Point Distribution

Biweekly Meeting Minutes	10%
Homework	20%
Proposal and Presentation	20%
Final Presentation	25%
Final Report	25%

Grading Scale

Grade	Score (%)
A	90 – 100
B	80 – 89
C	70 – 79
D	60 – 69
F	< 60

Tentative Course Outline

Topic
Introduction
Teamwork and Leadership
Development of Proposal
Project Management
Proposal Presentation
Preparation of Poster Presentation
Technical Writing: Literature Review
Technical Writing: Methodology
Technical Writing: Tables and Figures
Technical Writing: Results
Design Requirement and Constraints: Standard Specifications
Globalization in Design
Sustainable and Resilient Design
Risk Management
Engineering Ethics
Health and Safety
Final Presentation
Final Report

Course Policy and Suggestions

Attendance Policy

- Students are expected to attend class regularly. However, attendance will not be formally recorded. Habitual tardiness will not be tolerated.

Homework Policy

- A due date and time will be indicated on each homework. **Homework submitted late will be penalized** as follows: 0-24 hours late: 25% penalty; 24-48 hours late: 50% penalty; 48+ hours late: 100% penalty. Exceptions may be made in cases where the student has spoken to the instructor prior to the due date of the homework or cases where there is a valid excuse (e.g., medical emergency with written proof).

Grading Policy

- Same grading policy will be applied to all students, **regardless of credit (either 1 or 3 credit).**
- For interdisciplinary project, civil engineering students will be graded by the instructor (civil engineering faculty). The project mentor (in different department) may request additional deliverables, which will **not** be part of your grade.
- All projects and deliverables, including presentations and reports, are expected to meet the "ABET Senior Design Requirement" (See below).

ABET Definition-Engineering Design

"Engineering design is the process of devising a system, component, or process to meet desired needs. It is a decision-making process (often iterative), in which the basic sciences, mathematics, and the engineering sciences are applied to convert resources optimally to meet these stated needs."

- Engineering design typically includes both analysis and synthesis. Analysis without synthesis is not design
- Students should have some iterative design in the curriculum, but not all design experiences need be iterative
- Engineering design does not necessarily involve the devising of a complete system; a component or subsystem constitutes an acceptable design experience
- Students should have exposure to design problems that are incompletely defined and open-ended
- Exposure should be in at least two civil engineering contexts
- Engineering standards and realistic constraints are critical in civil engineering design; the program must show that standards and codes are taught and applied

General Policy

- Any student who needs special accommodations should notify the instructor within the first week of class. Montana Tech provides reasonable accommodations to students who are registered with Disability Services. If you have been diagnosed with or believe you may have a disability, contact Disability Services to discuss accommodations, access needs, and obtain an Accommodation Letter. You can reach the Disability Services Coordinator **Shauna Goodell via email at sgoodell@mtech.edu**, by phone at 406-496-4428, or in person in the Academic Center for Excellence (ACE) within the Student Success Center (SSC). All services are confidential. Once you have received your letter, please meet with me to discuss your access needs.
- Please make your cell phone silent during classes.

MontanaTech *Curriculum Change Request Form Dated December 23, 2022*

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.

Final changes are made by the registrar after faculty senate approval and BOR approval, as needed.
See workflow document
https://helpx.adobe.com/acrobat/how-to/convert-word-excel-paper-pdf-forms.html?set=acrobat--fundamentals--pdf-forms
Guidance can be found at: https://mus.edu/che/arsa/academicproposals.html

Submission Requirements: All Submissions (checked by CRC):

- ■ Electronic Copy (with the exception of signatures- no handwritten items)
- ⊡ Completed CRC Form, with all Signatures and Attachments based on level of request (see below)
- ■ Naming Convention as determined by CRC

LEVEL of Request

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

1. *Faculty Approvals (directly to CRC, then Faculty Senate):*
   - ■ Establish a new course for the catalog (please contact the Registrar of MUS CCN information) Required Documents:
     - ■ Course Number
     - ■ Course Outcomes
     - ■ Course Description
     - ■ Syllabus
     - ■ Curriculum Worksheet
     - ■ Pre-requisite or co-requisite
   - ■ Course Changes: addition, deletion or change of title, credit, course number, pre-req, description, or cross listing. Required Documents:
     - ☐ Course Number
     - ☐ Course Outcomes
     - ☐ Course Description
     - ☐ Syllabus
     - ■ Pre-requisites or co-requisites
     - ☐ Existing Curriculum Worksheet
     - ☐ New Curriculum Worksheet, with changes highlighted
   - ■ 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. Required Documents:
     - ■ **Documents as listed under establishing a new course (as applicable)**
     - ■ Existing Curriculum Worksheet
     - ■ New Curriculum Worksheet, with changes highlighted
   - ☐ Other (for those that are considered in this level but otherwise not listed):

     _____

2. *Campus Approvals Level I (must be approved by the VCAA prior to CRC submission):*
   - ☐ Placing a postsecondary educational program into moratorium: Required Documents:
     - ☐ Program Termination and Moratorium Form
     - ☐ Academic Proposal Request Form
   - ☐ Withdrawing a postsecondary educational program from moratorium. Required Documents:
     - ☐ Academic Proposal Request Form

- ☐ Establishing, re-titling, terminating or revising a campus certificate of 29 credits or fewer. Required Documents:
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Establishing a B.A.S./A.A./A.S. area of study. Required Documents:
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Offering an existing postsecondary educational program via distance or online delivery. Required Documents:
  - ☐ Academic Proposal Request Form

3. OCHE Approvals Level I *(must be approved by the VCAA and Chancellor prior to CRC submission)*:
Level I items are those requests for which the Board of Regents has fully designated approval authority to the institution or Commissioner of Higher Education. These requests are to be submitted for notification to or approval by Commissioner as Level I proposals. Level I proposals may be submitted to OCHE at any time by the flagship campuses or community colleges and will be processed on a rolling monthly schedule. The approval of such proposals will be conveyed to the Board of Regents at the next meeting of the board. Level I proposals include campus initiatives typically characterized by minimal costs, clear adherence to approved campus mission, and the absence of significant programmatic impact on other institutions within the MUS and community colleges. BOR Forms can be found using the following link:
https://mus.edu/che/arsa/Forms/AcademicForms.html

- ☐ Re-titling an existing postsecondary educational program. Required Documents:
  - ☐ Academic Proposal Request Form
- ☐ Terminating an existing postsecondary educational program.
  - ☐ Academic Proposal Request Form
  - ☐ Program Termination and Moratorium Form
- ☐ Consolidating existing postsecondary educational programs
  - ☐ Academic Proposal Request Form
  - ☐ Curriculum Proposal Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Establishing a new minor where there is a major or an option in a major
  - ☐ Academic Proposal Request Form
  - ☐ Curriculum Proposal Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Revising a postsecondary educational program
  - ☐ Curriculum Proposal Form
  - ☐ Academic Proposal Request Form
- ☐ Establishing a temporary C.A.S. or A.A.S. degree program Approval limited to 2 years
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**

4. Level II *(must be approved by the VCAA and Chancellor prior to CRC submission)*:
Level II proposals require initial approval and comment by the Board of Regents through a Request to Plan prior to final review and approval by the Office of the Commissioner of Higher Education. These proposals entail more substantive additions to, alterations in, or termination of programs, structures, or administrative or academic entities typically characterized by the (a) addition, reassignment, or elimination or personnel, facilities, or courses of instruction; (b) rearrangement of budgets, cost centers, funding sources; and (c) changes which by implication could impact other MUS institutions and community colleges.

- ☐ Establishing a new postsecondary educational program

- ☐ Request to Plan (RTP)
- ☐ Academic Proposal Request Form
- ☐ Curriculum Proposal
- ☐ Fiscal Analysis Form
- ☐ Completed Intent to Plan Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Permanent authorization for a temporary C.A.S. or A.A.S degree program

- ☐ Academic Proposal Request Form
- ☐ C.A.S/A.A.S Curriculum Proposal
- ☐ Fiscal Analysis Form
- ☐ Completed Intent to Plan Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Exceeding the 120 credit maximum for baccalaureate degrees Exception to policy 301.11

- ☐ Academic Proposal Request Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Forming, eliminating or consolidating an academic, administrative, or research unit

- ☐ Academic Proposal Request Form
- ☐ Curriculum or Center/Institute Proposal
- ☐ Completed Request to Plan, except when eliminating or consolidating
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Re-titling an academic, administrative, or research unit Permanent authorization for a temporary C.A.S. or A.A.S degree program

☐ Curriculum Proposal

☐ Completed Intent to Plan Form

MontanaTech *Curriculum Change Request Form Dated December 23, 2022*

Date 2/27/2024
Dept. Computer Science **College** LCME
Program Computer Science **CRC Representative** Dr. Melissa Holmes

Description of Request:

We propose an update of the curriculum with supporting course changes to align with ABET, provide options and reduce scheduling challenges and keep the curriculum current

Current Course or Program Information:

Current curriculum is provided along with proposed curriculum and the course changes are listed below

Number (Assigned By CRC):

Proposed Change

Course #	Name	Credits	Pre-req.

Curriculum changes

1. Replace CSCI 194 Freshman Seminar with EGEN 194 Freshman Seminar
2. Add CSCI 102 Computational thinking as a first-year course (course already exists)
3. Simplify the science requirement to 8 hours from science core courses
4. Remove M 273 and 274 (calculus 3 and differential equations)
5. Remove CSCI 255 Embedded systems
6. Require senior project and capstone (Fix at 3 credit hours each) . Students take CSCI 486 for first semester and CSCI 499W. Change name of CSCI 499W from Capstone: Data Science Project to Capstone
7. Add M 417 (Topological data analysis) and CSCI 477 (Computer Modeling and Simulation) to the options in the required upper-level math elective. Both courses already exist. Remove M 426 from the list of options to meet this requirement
8. Add senior seminar/internship class 3 credit hours Request CSCI 496, not in common course numbering.
9. Add a math/science elective
10. Require CSCI 447 (Machine Learning) and CSCI 443 (User Interface Design)

New course
CSCI 496 Seminar/internship 3 credit hours Prerequisite: Senior Standing or summer internship in CS/SE related field
Course (Catalog) Description: Investigations in the Computer Science and Software Engineering fields. Students will report on their internship experience, present their senior design projects, and/or present their undergraduate research. Faculty and guest speakers will discuss current issues in computer science and software engineering.

Prerequisites: Senior standing or consent of the instructor
Co-requisites: None
Designation: Required

Course Outcomes:
1. Students develop professional and communication skills, including presenting technical information to a variety of audiences, preparing short elevator pitch type presentations and memos, and developing longer presentations.
2. Students develop research and technical skills by preparing a research presentation with a paper on their internship or on a current topic in computer science or software engineering.
3. Students learn about new and different areas of computer science by attending presentations and preparing work.
4. Students learn research and library skills by doing literature reviews and managing references.

Prerequisite changes
•CSCI 210: Change prerequisite to CSCI 135 or instructor's approval
• CSCI 361: Remove CSCI 255 as a prerequisite
• Update catalog description of CSCI 332 to include parallel processing.
• CSCI 347: Remove "CSCI 114 or CSCI 117". Retain CSCI 135 as prerequisite. Remove "CSCI 340 or BMIS 375."
• CSCI 443: Remove "course not offered unless COMX 338, Usability Testing, is not available." Change Corequisite of ESOF 322 to Prerequisite of CSCI 135.
• CSCI 444: Remove "CSCI 112 or CSCI 117". Retain CSCI 135 as prerequisite.
• CSCI 447: Remove CSCI 332, replace with CSCI 347.
Catalog description

o Current: Covers several advanced data structures, including balanced search trees and graphs. Studies common algorithm design methods (Brute Force, Decrease and Conquer, Divide and Conquer, Greedy, and Dynamic Programming) to solve various classic problems. Ehmphasizes the space and time complexitites of various data structures and their associated algorithms.
o Proposed: Covers several advanced data structures, including balanced search trees and graphs. Studies common algorithm design methods (Brute Force, Decrease and Conquer, Divide and Conquer, Greedy, Dynamic Programming, and Parallel Processing) to solve various classic problems. Emphasizes the space and time complexities of various data structures and their associated algorithms.

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

List of supporting documentation attached (See Level of Request for Requirements):

Assessment Leading to Request

This new curriculum was developed to enable students to have a clearer path to graduation, meet all ABET requirements for a degree in computer science and have more options in electives to customize their degree plan. It is also more transfer friendly to students.
The current curriculum when combined with classes offered required the vast majority of our students to submit course substitutions and prerequisite waivers, and the Calc 3 and Differential Equations requirements discouraged transfer into the program.

Anticipated Impacts to "Other" Programs

This may impact enrollment in the 400 level math courses with the changes in options to fill that requirement.

Impact on Library: None required - no new course content proposed has consulted with _____ 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 (note that the earliest date is the next calendar year): _____

APPROVALS

Department Head Approval _____
Date 2/29/24

Dean Approval _____
Date 2-29-24

Graduate Council Approval _____
Date _____

CRC Approval Tamara Harp
Date 03/07/2024

Faculty Senate Approval _____
Date _____

VCAA Approval (see below) _____
Date _____

Chancellor Approval (see below) _____
Date _____

Proposed					
Year 1 Fall Semester		Tech requirements	ABET CS (40)	ABET Math (15)	Curriculum requirements
Egen 194	1				
CSCI 135 - Fundamentals Of Computer Science I	3		3		2
M 171 - Calculus I	3	3 - math		3	
Humanities & Fine Arts Elective	3	3- hum			
WRIT 121/101	3	3- com			
CSCI 102	3	3 soc			2
	16				
Year 1 Spring Semester					
M 172 - Calculus II	3	math met (6 hours)		3	
Humanities & Fine Arts Elective	3	humanities met (6 hours)			
CSCI 210 - Web Programming	3		3		2
CSCI 136 - Fundamentals Of Computer Science II	3		3		
Social science elective	3	social science met 6 hours			
	15				
Year 2 Fall Semester					
CSCI 232 - Data Structures and Algorithms 3 credits	3		3		1
CS/SE/DS/ITS elective	3		3		
Science core plus lab	4	4- scinece			
COMX 230/111 -	3	communication met (6 hours)			
CSCI 246 - Discrete Structures 3 credits	3			3	Discrete math
	16				
Year 2 Spring Semester					
CSCI 332 - Design & Analysis of Algorithms 3 credits	3		3		1,3
M 333 - Matrices & Linear Algebra 3 credits	3			3	
Science core (3 credits acceptable if total hours met)	4	science met (7 including lab)			
Math/Science elective	3				
CS/SE/DS/ITS elective	3		3		
	16				
Year 3 Fall Semester					
CSCI 305 - Concepts of Programming Languages 3 credits	3		3		1
ESOF 322 - Software Engineering 3 credits	3		3		3
STAT 332 - Statistics for Scientists and Engineers 3 credits	3			3	
CSCI 347 - Data Mining 3 credits	3		3		
WRIT 321W/322W/325W - Advanced Writing 3 credits	3	W course met			
	15				
Year 3 Spring Semester					
ESOF 376 - Engineering Secure Software 3 credits	3		3		1
CSCI 361 - Computer Architecture 3 credits	3		3		3
CSCI 440 - Database Systems 3 credits	3		3		
M 410/M417/CSCI 477	3			3	
	12				
Year 4 Fall Semester					
CSCI 486 Senior project 1	3		3		5
CSCI 446 Artificial Intelligence	3		3		
CSCI 466 - Networks 3 credits	3		3		3
CSCI 496- Senior Seminar/Internship	3		3		
CSCI 443 User Interface Design	3		3		
	15				
Year 4: Spring Semester					
CSCI 438 - Theory Of Computation	3		3		1,4
CSCI 460 - Operating Systems 3 credits	3		3		
CSCI 470 - Web Science 3 credits	3		3		
CSCI 499W Senior project	3		3		
CSCI 447 Machine Learning	3		3		5
	15		69		

Total credits: 120 CS Hours 69 Math hours 18

1. Substantial coverage of algorithms and complexity, computer science theory, concepts of programming languages, and software devel
2. Substantial coverage of at least one general-purpose programming language.
3. Exposure to computer architecture and organization, information management, networking and communication, operating systems, and
4. The study of computing-based systems at varying levels of abstraction.
5. A major project that requires integration and application of knowledge and skills acquired in earlier course work.-

Current CS curriculum from catalog

Freshman

Fall Semester

- CSCI 194 - Freshman Seminar *1 credit*
- CSCI 135 - Fundamentals Of Computer Science I *3 credits*
- M 171 - Calculus I *3 credits*
- Humanities & Fine Arts Elective *3 credits*
- Social Science Elective *3 credits*
-
- WRIT 121 - Introduction To Technical Writing *3 credits*
- -OR-
- WRIT 101 - College Writing I *3 credits*

Total: 16

Spring Semester

- M 172 - Calculus II *3 credits*
- Science Elective *4 credits* *
- CSCI 210 - Web Programming *3 credits*
- CSCI 136 - Fundamentals Of Computer Science II *3 credits*
-
- COMX 230 - Presenting Technical Information *3 credits*
- -OR-
- COMX 111 - Introduction to Public Speaking *3 credits*
-

Total: 16

Sophomore

Fall Semester

- CSCI 232 - Data Structures and Algorithms *3 credits*
- CSCI 246 - Discrete Structures *3 credits*
- M 273 - Multivariable Calculus *4 credits*
- Science Elective *4 credits* *

Total: 14

Spring Semester

- CSCI 332 - Design & Analysis of Algorithms *3 credits*
- M 333 - Matrices & Linear Algebra *3 credits*
- M 274 - Introduction to Differential Equation *3 credits*
- Social Science Elective 3 *credits* *
- CSCI 255 - Introduction to Embedded Systems *3 credits*

Total: 15

Junior

Fall Semester

- CSCI 305 - Concepts of Programming Languages *3 credits*
- ESOF 322 - Software Engineering *3 credits*

- STAT 332 - Statistics for Scientists and Engineers *3 credits*
- Professional or Free Elective *3 credits***
- CSCI 347 - Data Mining *3 credits*

Total: 15

Spring Semester

- ESOF 376 - Engineering Secure Software *3 credits*
- Humanities & Fine Arts Elective *3 credits*
- CSCI 361 - Computer Architecture *3 credits*
- CSCI 440 - Database Systems *3 credits*
-
- M 410 - Numerical Computing for Engineering & Science *3 credits*
- -OR-
- M 426 - Mathematical Modeling *3 credits*

Total: 15

Senior

Fall Semester

- CSCI 446 - Artificial Intelligence *3 credits*
- CSCI 498 - Internship *1 - 6 credits (Variable)* (Or CSCI 486) 2 cr. required
- Professional or Free Elective *3 credits***
- CSCI 466 - Networks *3 credits*
-
- WRIT 321W - Advanced Technical Writing *3 credits*

- -OR-
- WRIT 325W - Writing in the Sciences *3 credits*
- -OR-
- WRIT 322W - Advanced Business Writing *3 credits*

Total: 14

Spring Semester

- CSCI 438 - Theory Of Computation *3 credits*
- CSCI 460 - Operating Systems *3 credits*
- CSCI 470 - Web Science *3 credits*
- CSCI 494 - Senior Seminar *1 credit*
- CSCI 498 - Internship *1 - 6 credits (Variable)* (Or CSCI 486) 2 cr. required
- Professional or Free Elective *3 credits***

Total: 15

Minimum Credits for a B.S. in Computer Science: 120

**Professional Electives can be used to complete a custom focus area. Work with your advisor to determine 9 credits of coursework in your field of interest.

* Science electives must include two semesters of science with a lab (minimum of 6 credits total) with the exception of the physics sequence of PHSX 234 and 235/236. PHSX 234 combined with anything but 235/236 is not accepted. Science electives + free electives must total to 8 credits. Take the physics sequence for the Electronic Control Systems focus.

Computer Science Curriculum Changes Summary:

1. Replace CSCI 194 with EGEN 194

   Reasoning: Take advantage of an existing course that CS and SE faculty already participate in, free up faculty resources, and introduce some engineering problem solving

2. Add CSCI 102 as a first-year course (course already exists)

   Reasoning: Meet sociology requirement, take advantage of the dual enrollment nature of the course

3. Simplify the science requirement to 8 hours from science core courses

   Reasoning: Allow more options for students, reduce scheduling challenges

4. Remove M 273 and 274

   Reasoning: Not required by ABET, not prerequisites for CS or SE courses, and makes transfer agreements difficult

5. Fix the number of hours at 3 credit hours per semester for project/capstone sequence. Rename CSCI 499W to Capstone instead of Capstone: Data Science Project

   Reasoning: Meet ABET requirements for a Capstone experience, use a two-semester format to do a complete project, simplify scheduling and ensure consistent experience by fixing the number of credit hours, allow more flexibility of topic

6. Adjust M 417 (Topological data analysis) and CSCI 477 (Computer Modeling and Simulation) to the options in the required upper-level math elective. Both courses already exist. Remove M 426 from the list of options to meet this requirement.

   Reasoning: Adding CSCI 477 gives the CS department the opportunity to offer a course to meet this requirement, adding M 417 gives an option to students interested in data science. Remove M 426 from the list due to prerequisites and overlap with CSCI 477

7. Add senior seminar/internship class: Request CSCI 496, not in common course numbering. (New class 3 credit hours) See syllabus below.

   Reasoning: Compliance with internship rules, consistent class for both students with or without internships, improve presentation skills and present a variety of current topics.

8. Add a math/science elective

9. Require CSCI 447 (Machine Learning) and CSCI 443 (User Interface Design)

10. Remove any remaining language in catalog about concentrations

Software Engineering Curriculum Changes Summary

Software Engineering Curriculum Changes Summary

1. Replace CSCI 194 with EGEN 194
2. Add CSCI 102 as a first-year course (course already exists)
3. Simplify the science requirement to 8 hours from science core courses
4. Remove M 273 and 274
5. Add senior seminar/internship class Request CSCI 496, not in common course numbering.
6. Add a math/science elective
7. Require CSCI 447 (Machine Learning)
8. Remove CSCI 255 (Embedded systems)

   Reasoning: This course is no longer going to be taught through the EELE or required for EELE students, and at this time we have no faculty available to teach it.

9. Add EELE 201/202 Circuits and Lab, and EELE 261 Intro to Logic Circuits

   Reasoning: These courses add a good engineering foundation for software engineers and they also provide a good substitute for CSCI 255

10. Change ESOF 486 and ESOF 487 to 3 credit hours each

Prerequisite and catalog changes for existing courses

- CSCI 210: Change prerequisite to CSCI 135 or instructor's approval
- CSCI 361: Remove CSCI 255 as a prerequisite
- Update catalog description of CSCI 332 to include parallel processing.
- CSCI 347: Remove "CSCI 114 or CSCI 117". Retain CSCI 135 as prerequisite. Remove "CSCI 340 or BMIS 375."
- CSCI 443: Remove "course not offered unless COMX 338, Usability Testing, is not available." Change Corequisite of ESOF 322 to Prerequisite of CSCI 135.
- CSCI 444: Remove "CSCI 112 or CSCI 117". Retain CSCI 135 as prerequisite.
- CSCI 447: Remove CSCI 332, replace with CSCI 347.

- Update catalog description of CSCI 332 to include parallel processing and correct spelling
    - Current: Covers several advanced data structures, including balanced search trees and graphs. Studies common algorithm design methods (Brute Force, Decrease and Conquer, Divide and Conquer, Greedy, and Dynamic Programming) to solve various classic problems. Ehmphasizes the space and time complexitites of various data structures and their associated algorithms.
    - Proposed: Covers several advanced data structures, including balanced search trees and graphs. Studies common algorithm design methods (Brute Force, Decrease and Conquer, Divide and Conquer, Greedy, Dynamic Programming, and Parallel Processing) to solve various classic problems. Emphasizes the space and time complexities of various data structures and their associated algorithms.

CSCI 496 Senior Seminar/Internship

Department:	Computer Science
Course Schedule:	3 credit/3 lecture hours per week
Textbook:	None
Course (Catalog) Description:	Investigations in the Computer Science and Software Engineering fields. Students will report on their internship experience, present their senior design projects, and/or present their undergraduate research. Faculty and guest speakers will discuss current issues in computer science and software engineering,
Prerequisites:	Senior standing or consent of the instructor
Co-requisites:	None
Designation:	Required
Course Outcomes:	1. Students develop professional and communication skills, including presenting technical information to a variety of audiences, preparing short elevator pitch type presentations and memos, and developing longer presentations. **2.** Students develop research and technical skills by preparing a research presentation with a paper on their internship or on a current topic in computer science or software engineering. **3.** Students learn about new and different areas of computer science by attending presentations and preparing work. **4.** Students learn research and library skills by doing literature reviews and managing references.
Course Requirements:	Students taking this course will **1.** Propose a presentation topic of their choice and make a five-minute pitch to the class about the topic 2. Prepare and give a 20-minute presentation on this topic with references 3. Propose a second presentation topic either on their internship or one based on a literature review of a current research area in computer science or software engineering 4. Present a 30-minute presentation on this topic, along with a short paper. 5. Attend all other presentations and prepare a short evaluation and summary of each.

WEB PROGRAMMING (CSCI 210)

Department: Computer Science

Course Schedule: MWF 1:00-1:50 pm

Textbook: *Learning PHP, MySQL & JavaScript by Robin Nixon*

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Printed in the United States of America.

Published by O'Reilly Media, Inc., 1005 Gravenstein Highway North, Sebastopol, CA 95472.

978-1-492-09382-4

Course (Catalog) Description: Web Scripting teaches beginning and intermediate designers the fundamentals of creating complex Web applications. Students will install and configure MySQL, php and Apache to allow the involvement of dynamic web applications. With the knowledge and expe rience gained here, beginners will learn the fundamental concepts behind these technologies and more experienced developers will learn which technology works best for their specific needs. Exercises, questions, and projects are included with each chapter. Web designers will learn how to use PHP, MySQL, HTML together while picking up valuable web programming practices along the way.

Prerequisites: Prior to taking this class, students should have completed an intro to programming class, Oracle, or HTML.

Co-requisites: CSCI 135 or instructor's approval

Designation: Required

Course Outcomes:

- Understanding of database connectivity to service-side scripting
- Basic SQL commands (CRUD) and understanding relational databases.
- Server-side scripting using PHP
- User input validation using regular expressions and client-side scripting
- Sanitizing user input and preventing SQL injections
- Design and coding techniques for hash data
- Basic HTMl, CSS, and java Scripting integration into server-side scripting.
- Loading data into database tables from external data source (i.e. XML)
- Testing Methodology. Allows troubleshoot one problem at a time and test.

Computer Architecture (CSCI 361)

Department: Computer Science

Course Schedule: MWF 10:00-10:50 am

Contribution to Professional Component:

Textbook: Computer Organization and Design: The Hardware/Software Interface ARM Edition, by David A. Patterson and John L. Hennessy, ZyBook, required

Course (Catalog) Description: Studies the design and organization of computer systems, including the instruction set and interconnection of hardware components. Topics include computer performance, assembly language programming, microprocessor architecture, pipeline processing, memory and storage organization, and multiprocessor computers.

Prerequisites: CSCI 135

Co-requisites: N/A

Designation: Required

Course Outcomes:

R1. Students are familiar with historical developments in computer hardware and associated performance improvements.

R2. Students know how to evaluate hardware performance and are able to choose the best system or hardware design given a set of alternatives. (CS: 2, 6; SE: 2, 1)

R3. Students know the instruction set, for a specific architecture, including the different instruction formats, addressing modes and relationships to higher languages. (CS: 2)

R4. Students understand how procedures, pointers and arrays are implemented in assembly and machine code. (CS: 2)

R5. Students know the characteristics of a good instruction set. (CS: 2, 6)

R6. Students can research and present a recent computer architecture/system not covered in lecture. (CS: 3; SE: 3)

R7. Students understand how arithmetic and logic operations are designed and implemented. (CS: 2; SE: 1, 2)

R8. Students understand single cycle and pipelined datapaths and can modify either to implement additional instructions. (CS: 2, 6; SE: 2, 1)

R9. Students understand pipelining, its associated hazards and techniques to best handle hazards. (CS: 2, 6; SE: 1, 2)

R10. Students understand memory hierarchy, basics of caches, system buses, and how they affect computer performance. (CS: 2; SE: 1, 2)

R11. Students are familiar with different multiprocessor architectures. (CS: 2; SE: 1, 2)

Design and Analysis of Algorithms (CSCI 332)

Department: Computer Science

Textbook: *Introduction to the Design and Analysis of Algorithms, 3rd Ed*
Levitan, Anany
Pearson Education; 978-0-13-231681-1

Course (Catalog) Description: Covers several advanced data structures, including balanced search trees and graphs. Studies common algorithm design methods (Brute Force, Decrease and Conquer, Divide and Conquer, Greedy, Dynamic Programming, and Parallel Processing) to solve various classic problems. Emphasizes the space and time complexities of various data structures and their associated algorithms.

Prerequisites: CSCI 232, CSCI 246

Co-requisites:

Designation: Required

Course Outcomes:

- Students will know how to implement advanced data structures (hash table, balanced search tree, and/or a graph) using OOP design in a high-level programming language and use them in simple programs. (CS: 2, 5-a-4, 6; SE: 1, III-1-2-1)
- Students will be able to perform in-depth algorithm analysis, including average case efficiencies and Ω and θ asymptotic notations. (CS: 5-1, 1, 6; SE: 1, III-1-2-1)
- Students will know how to solve recurrences and use the Master Theorem for Divide and Conquer algorithms. (CS: 5-1, 1, 6; SE: 1, III-1-2-1)
- Students will understand different algorithm design techniques (Brute Force, Decrease and Conquer, Divide and Conquer, Greedy, and Dynamic Programming). (CS: 5-1, 2, 6; SE: 1, III-1-2-1)
- Students will be able to prove the correctness of an algorithm. (CS: 5-1, 6; SE: 1)
- Students will understand algorithms that solve classic problems, such as: sorting, knapsack, string processing, matrix multiplication, spanning trees, shortest paths, traveling salesperson, Huffman coding. (CS: 5-1, 2, 6; SE: 1, III-1-2-1)
- Students can identify and understand why some problems cannot be solved efficiently (NP problems). (CS: 5-1, 2, 6; SE: 1, III-1-2-1)

Data Mining (CSCI 347)

Department: Computer Science

Textbook: *Python Data Science Handbook by Jake VanderPlas*

Course (Catalog) Description: Provides a grounding in data mining techniques and prepares students to design, use, and evaluate these techniques in a variety of application domains and for the purpose of decision support. Topics include decision trees, rule-based systems, statistical approaches and instance based approaches.

Prerequisites: CSCI 135 (Fundamentals of CS I)

Co-requisites:

Designation: Selected Elective (Professional Elective)

Course Outcomes:

R1. Students can identify key characteristics of data mining and/or decision support projects, and can use these characteristics to choose appropriate data mining techniques.

R2. Students understand and can apply data preprocessing techniques appropriately.

R3. Students understand the underlying theory, biases, strengths, and weaknesses of different data mining techniques.

R4. Students understand and are able to apply measures of success to algorithm output, and can measure performance differences between algorithms.

R5. Students are able to use data mining algorithms including decision trees, rule based systems, statistical approaches, instance based approaches, linear techniques, and clustering, to both example data sets and real life data sets.

R6. Students have a firm grasp of supervised and unsupervised approaches to data mining and when to use each type.

CSCI 443 – User Interface Design

Department:	Computer Science
Course Schedule:	3 credits: 3 hours lecture per week
Textbook:	*UX for Beginners* by Joel Marsh
Course (Catalog) Description:	Provides an introduction to designing user interfaces for a variety of interactive systems. The design process emphasizes the development of software systems from a user, rather than system-oriented perspective. The course focuses on using real users to complete the specification, design, evaluation, and testing of the interface. Students will learn both human (cognitive) and technological tools for designing and building interfaces. The course also presents human-computer interaction concepts and theory, which involves computer science, psychology, social behavior, and other human factors associated with computer use.
Prerequisites:	CSCI 135
Co-requisites:	
Designation:	Required
Course Outcomes:	R1. Students understand the economic, social and environmental impact of poor user interfaces along with contemporary issues in usability. (SE: 2, 4) R2. Students can evaluate the usability of a user interface and discuss it in terms of design elements and human behaviors. (SE: 2) R3. Students completed an iterative, user-centered design process and are able to involve users in all phases of user interface development. (SE: 2, 3) R4. Students have designed, prototyped and evaluated a user interface. (SE: 1) R5. Students have developed and implemented an evaluation plan and used the results to improve a user interface. (SE: 1, 6)

Data Visualization (CSCI 444)

Department: Computer Science

Course Schedule: MWF 9:00-9:50 am

Course (Catalog) Description: Covers the principles, methods, and techniques for effective visual analysis of data. Students will use both common and special software packages to explore different visualization applications. Students will learn how to formulate 3-D numerical models, translate 3-D models into graphical displays, and create time sequences and pseudo-animations. The course covers interactive versus presentation techniques and special techniques for video, DVD, and other media displays

Prerequisites: CSCI 135 (Fundamentals of CS I)

Co-requisites:

Designation: Elective

Course Outcomes:

R1. Produce high quality visuals involving scatter plots, time series, contours, histograms, relational data, geographically distributed data, multi-component datasets, simulation output, 3-dimensional datasets and animations.

R2. Provide insights into how information is perceived, and how models of perception can be exploited to improve the quality of visualizations.

R3. Develop skills for the statistical analysis of data.

R4. Strengthen the students' programming and computer skills.

R5. Deliver a theoretical background sufficient for students to understand whatever visualization packages they may encounter in the future.

R6. Prepare the students for employment or graduate work in areas that employ visualizations to communicate information.

Machine Learning (CSCI 447)

Department: Computer Science

Course Schedule: MWF 10:00-10:50 am

Contribution to Professional Component:

Instructor: Douglas Galarus

Textbook: *Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow, 2nd Edition by Aurélien Géron*

Course (Catalog) Description: Introduction to the framework of learning from examples. Topics include various learning algorithms such as neural networks, Bayesian networks, and genetic algorithms, and generic learning principles such as bias/variance, MDL principle, and ethical considerations. Review statistical learning techniques, yet focuses on non-statistical techniques.

Prerequisites: CSCI 347 Data Mining

Co-requisites:

Designation: Required

Course Outcomes:

R1. Be comfortable with machine learning fundamentals including probability, linear algebra, data analysis, the overall machine learning process and general dimensions of machine learning problems

R2. Have reviewed the statistical techniques of regression, clustering and the nearest neighbor approach.

R3. Understand and be able to implement machine learning algorithms such as neural networks, Bayesian networks and genetic algorithms.

R4. Be able to discuss tradeoffs between different machine learning algorithms, hyperparameter selection heuristics, and bias/variance.

R5. Understand performance metrics and what measures to use to compare results from different models.

R6. Be able to identify and implement ensemble learning techniques.

R7. Be able to develop workable representations for the various approaches, and identify situations in which data manipulation must be used prior to learning.

R8. Understand ethical considerations and assumptions behind the development of a learned model.

Computational Modeling and Simulation (CSCI 477)

Department: Computer Science

Textbook: *Modeling and Simulation: Exploring Dynamic System Behavior, 2nd Ed*
Birta, Louis G.; Arbez Gilbert
Springer; 2195-2817

Introduction to Computation and Programming using Python: with Application to Understanding Data, 2nd Ed
Guttag, John V.
MIT Press; 978-0-262-52962-4

Course (Catalog) Description: Covers various computational modeling and simulation principles and techniques applicable to various domains of engineering and science. The course will rely on the python programming language and use frameworks such as PySim to explore topics in discrete event simulation; such as Apache Mesa to explore agent-based modeling; and SciPy to explore topics in continuous time simulation. Students will implement and apply these methods, including model verification and validation, to basic examples. Other topics include matrix languages, ODE solving, PDE solving, finite difference approximation, finite element methods, and visualize data generated from computer simulations.

Prerequisites: CSCI 135 and STAT 332

Co-requisites:

Designation: One of the three options to meet the upper level math requirement

Course Outcomes:

- Be familiar with the importance of modeling for science and engineering.
- Be able to identify different types of models and simulation.
- Be able to create a computer simulation of a set of observations based on the system's physical characteristics.
- Be able to solve both ordinary and partial differential equations with computers.
- Know how to verify and validate a computational model using data.
- Know how to construct a computer visualization of the model results.
- Understand the quality of the model and sources of errors.

CSCI 486 – Senior Project

Department: Computer Science

Designation: Required

Credit hours: 3

Course (Catalog) Description: Individual or small group pursuit of a project preferably an advanced topic in computing.

Prerequisites: Senior Standing or Consent of Instructor

Co-requisites: None

Textbook: None

Course Outcomes:

R1. The student will demonstrate the ability to apply knowledge of computing and mathematics acquired in their previous coursework to the solutions of research problem or a client project.

R2. The student will demonstrate the ability to analyze a problem and identify the appropriate computing requirements appropriate to its solutions. (CS: 1)

R3. The student will demonstrate the ability to design, implement and evaluate computer-based systems, processes, components, or programs to meet desired needs. (CS: 2)

R4. The student will recognize the need for, and demonstrate the ability to, engage in continuing professional development.

R5. The student will demonstrate the ability to use current techniques, skills, and tools necessary for computing practice, as appropriate to the problem or project.

R6. The student will demonstrate the ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices. (CS: 6)

R7. The student will demonstrate the ability to apply design and development principles in the construction of software of varying complexity.

MontanaTech *Curriculum Change Request Form Dated August 15, 2020*

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Final changes are made by the registrar after faculty senate approval and BOR approval, as needed.
See workflow document
https://helpx.adobe.com/acrobat/how-to/convert-word-excel-paper-pdf-forms.html?set=acrobat--fundamentals--pdf-forms
Guidance can be found at: https://mus.edu/che/arsa/academicproposals.html

Submission Requirements: All Submissions (checked by CRC):

- ■ Electronic Copy (with the exception of signatures- no handwritten items)
- ⊡ Completed CRC Form, with all Signatures and Attachments based on level of request (see below)
- ■ Naming Convention as determined by CRC

LEVEL of Request

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

1. *Faculty Approvals (directly to CRC, then Faculty Senate):*
   - ■ Establish a new course for the catalog (please contact the Registrar of MUS CCN information) Required Documents:
     - ■ Course Number
     - ■ Course Outcomes
     - ■ Course Description
     - ■ Syllabus
     - ☐ Curriculum Worksheet
     - ■ Pre-requisite or co-requisite
   - ☐ Course Changes: addition, deletion or change of title, credit, course number, pre-req, description, or cross listing. Required Documents:
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   - ☐ Other (for those that are considered in this level but otherwise not listed):

     _____

2. *Campus Approvals Level I (must be approved by the VCAA prior to CRC submission):*
   - ☐ Placing a postsecondary educational program into moratorium: Required Documents:
     - ☐ Program Termination and Moratorium Form
     - ☐ Academic Proposal Request Form
   - ☐ Withdrawing a postsecondary educational program from moratorium. Required Documents:
     - ☐ Academic Proposal Request Form

- ☐ Establishing, re-titling, terminating or revising a campus certificate of 29 credits or more. Required Documents:
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Establishing a B.A.S./A.A./A.S. area of study. Required Documents:
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Offering an existing postsecondary educational program via distance or online delivery. Required Documents:
  - ☐ Academic Proposal Request Form

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

- ☐ Request to Plan (RTP)
- ☐ Academic Proposal Request Form
- ☐ Curriculum Proposal
- ☐ Fiscal Analysis Form
- ☐ Completed Intent to Plan Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

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- ☐ Academic Proposal Request Form
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☐ Exceeding the 120 credit maximum for baccalaureate degrees Exception to policy 301.11

- ☐ Academic Proposal Request Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

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☐ Re-titling an academic, administrative, or research unit Permanent authorization for a temporary C.A.S. or A.A.S degree program

☐ Curriculum Proposal

☐ Completed Intent to Plan Form

MontanaTech *Curriculum Change Request Form Dated August 15, 2020*

Date 2/28/2024
Dept. Geological Engineering **College** Lance College of Mines and Engineering
Program BS Geological Engineering **CRC Representative** Mary MacLaughlin

Description of Request:

Add GeoE 444 Rock Mechanics Lab

Current Course or Program Information:

BS GeoE currently requires Min 467 Geomechanics (3 cr) which has a lab component. We propose a 1-cr lab only course.

Number (Assigned By CRC):
Proposed Change

Course # Name	Credits	Pre-req.
GEOE 444 Rock Mechanics Lab	1 (hrs: 3 lab)	GeoE 440 or consent of instructor

Covers laboratory procedures for basic and advanced rock mechanics tests. (May not be taken for credit along with Min 467 Geomechanics.)

Outcomes:
-Students will learn to prepare rock specimens for basic and advanced rock mechanics tests.
-Students will learn the standard procedures for conducting point load tests, Brazilian tensile tests, ultrasonic velocity tests, unconfined compression tests, triaxial shear tests, direct shear tests, and others as appropriate.
-Students will perform the tests and learn to interpret test data to provide engineering characterization parameters for rock engineering and design.

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

List of supporting documentation attached (See Level of Request for Requirements):

Assessment Leading to Request

Geological Engineering is in the process of reducing its curriculum from 130 credits to 120 credits, and at the same time, providing for optimum flexibility for our students to complete the degree requirements. We have identified one opportunity to reduce the number of credits would be to offer a 1-credit Rock Mechanics Lab course as an alternative to the currently required 3-credit Min 467 Geomechanics course, which includes a lab. "Geomechanics" is required for ABET accreditation but is covered and assessed in the required GeoE 440 Geological Engineering course. We have never used Min 467 for ABET assessment. The Min 467 course covers additional topics that not all Geological Engineering students need. Students in the Mining Option of GeoE would still be required to take the 3-credit Min 467 course because the content is aligned with their career paths. We would like to allow students in other options to satisfy a rock mechanics lab experience in a 1-credit course. (We are considering other allowable 1-credit alternatives such as Pet 205 and ECiv 487, but they do not contain the content that would be ideal for most geological engineering students.)

Anticipated Impacts to "Other" Programs

Min 467 may experience a small drop in enrollment in the lecture. GeoE will coordinate its offering of the rock mechanics lab with the mining engineering department, either combining or separating the labs (or both) based on what the mining engineering department wants to do. Petroleum engineering (and civil engineering) students may be interested in the 1-credit rock mechanics lab, allowing them to learn rock mechanics laboratory procedures but without the mining emphasis and without devoting time to a 3-credit course. We would work with other interested departments to establish appropriate alternative prerequisites if necessary.

Impact on Library: none has consulted with n/a 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 (note that the earliest date is the next calendar year): Calendar Year 2024/2025

APPROVALS

Department Head Approval Glenn Shaw
Date 2/28/24

Dean Approval
Date 2-29-24

Graduate Council Approval
Date _____

CRC Approval Tamara Harp
Date 03/07/2024

Faculty Senate Approval
Date _____

VCAA Approval (see below)
Date _____

Chancellor Approval (see below)
Date _____

Geological Engineering 444 Rock Mechanics Lab (1 credit)

Lab Meetings:	(TBA), MG 007	
Catalog Description	Covers laboratory procedures for basic and advanced rock mechanics tests.	
Prerequisites:	GeoE 440 or consent of instructor	
Instructors:	Dr. Mary MacLaughlin, MG 213B, mmaclaughlin@mtech.edu Steve Berry, MG 004B, sberry@mtech.edu Office hours as posted or by appointment	
Textbook:	None. Handouts provided. ASTM specifications posted to Moodle.	
Grading:	Lab Quizzes	10%
	Lab Reports	90%

Tentative List of Laboratory Exercises:

Lab safety orientation
Rock Quality Designation (RQD)
Specimen preparation
Point load tests
Brazilian tests
Ultrasonic tests
Unconfined compression test
Triaxial shear test
Direct shear test

Possible additional exercises:

Strain gage application and data collection with strain gages
Preparation and testing of concrete cylinders

Other information:

Lab time will be split between lab lectures and lab exercises.

Proper attire (including long pants and closed-toed shoes) is required for work in the lab. PPE is provided.

Students will work in teams of 2-3 to perform the experiments but are responsible for submitting their own individual lab reports.

Attendance and participation is required to receive credit for any lab exercise. Students must be present and must collect their own data. The ability to make up any missed exercises is limited.

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- ☐ Fiscal Analysis Form
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- ☐ **Documents as listed under establishing a new course (see section 1)**

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☐ Exceeding the 120 credit maximum for baccalaureate degrees Exception to policy 301.11

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☐ Curriculum Proposal

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MontanaTech *Curriculum Change Request Form Dated August 15, 2020*

Date 2/28/2024
Dept. Geological Engineering **College** Lance College of Mines and Engineering
Program BS Geological Engineering **CRC Representative** Mary MacLaughlin

Description of Request:

Add an FE Exam Course

Current Course or Program Information:

currently there is no FE Exam Course

Number (Assigned By CRC): GEOE 488
Proposed Change

Course #	Name	Credits	Pre-req.
GEOE 488	FE Examination	0	Within 2 semesters of graduation

This zero credit course must be taken by students prior to earning their BS degree in Geological Engineering. Students will show proof of completing the FE exam to receive a passing grade.

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

List of supporting documentation attached (See Level of Request for Requirements):

Assessment Leading to Request

Geological Engineering students are required to take the FE examination in order to receive their bachelor's degree. This has been a policy for many years. When the FE exam transitioned from paper to electronic, the linking of a passing grade in the FE exam review courses to taking the FE exam was eliminated. The Geological Engineering department implemented a mechanism to ensure that the students took the exam by linking it to the senior design course GeoE 499W. If the student does not show evidence of taking the exam prior to the end of the senior design course, they receive an incomplete grade until they show evidence of taking the FE exam. This has generally worked fairly well, but recently has been problematic for students with veteran benefits and paperwork for the senior design instructor for incomplete forms and removals. Furthermore, BSGE program only offers senior design during fall semester for a better field component to projects and the students aren't always ready to take the FE examination until the spring semester, especially with the burden of completing their senior design projects.

Anticipated Impacts to "Other" Programs

None

Impact on Library: none has consulted with Scott Juskiewicz 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 (note that the earliest date is the next calendar year): Calendar Year 2024/2025

APPROVALS

Department Head Approval Glenn Shaw
Date 2/28/24

Dean Approval
Date 2-29-24

Graduate Council Approval
Date _____

CRC Approval Tamara Harp
Date 03/07/2024

Faculty Senate Approval
Date _____

VCAA Approval (see below)
Date _____

Chancellor Approval (see below)
Date _____

MontanaTech *Curriculum Change Request Form Dated August 15, 2020*

GeoE 440 Name change (from "Engineering Geology" to "Geological Engineering")

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.

Final changes are made by the registrar after faculty senate approval and BOR approval, as needed.
See workflow document
https://helpx.adobe.com/acrobat/how-to/convert-word-excel-paper-pdf-forms.html?set=acrobat--fundamentals--pdf-forms
Guidance can be found at: https://mus.edu/che/arsa/academicproposals.html

Submission Requirements: All Submissions (checked by CRC):

- ☐ Electronic Copy (with the exception of signatures- no handwritten items)
- ☐ Completed CRC Form, with all Signatures and Attachments based on level of request (see below)
- ☐ Naming Convention as determined by CRC

LEVEL of Request

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

1. *Faculty Approvals (directly to CRC, then Faculty Senate):*
   - ☐ Establish a new course for the catalog (please contact the Registrar of MUS CCN information) Required Documents:
     - ☐ Course Number
     - ☐ Course Outcomes
     - ☐ Course Description
     - ☐ Syllabus
     - ☐ Curriculum Worksheet
     - ☐ Pre-requisite or co-requisite
   - ✓ Course Changes: addition, deletion or change of title, credit, course number, pre-req, description, or cross listing. Required Documents:
     - ☐ Course Number
     - ☐ Course Outcomes
     - ☐ Course Description
     - ☐ Syllabus
     - X Pre-requisites or co-requisites
     - ☐ Existing Curriculum Worksheet
     - ☐ New Curriculum Worksheet, with changes highlighted
   - ☐ 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. Required Documents:
     - ☐ **Documents as listed under establishing a new course (as applicable)**
     - ☐ Existing Curriculum Worksheet
     - ☐ New Curriculum Worksheet, with changes highlighted
   - ☐ Other (for those that are considered in this level but otherwise not listed):

     _____

2. *Campus Approvals Level I (must be approved by the VCAA prior to CRC submission):*
   - ☐ Placing a postsecondary educational program into moratorium: Required Documents:
     - ☐ Program Termination and Moratorium Form
     - ☐ Academic Proposal Request Form
   - ☐ Withdrawing a postsecondary educational program from moratorium. Required Documents:

- ☐ Academic Proposal Request Form

☐ Establishing, re-titling, terminating or revising a campus certificate of 29 credits or more. Required Documents:
- ☐ Academic Proposal Request Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Establishing a B.A.S./A.A./A.S. area of study. Required Documents:
- ☐ Academic Proposal Request Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Offering an existing postsecondary educational program via distance or online delivery. Required Documents:
- ☐ Academic Proposal Request Form

☐ Other (for those that are considered in this level but otherwise not listed):

_____

- ☐ Academic Proposal Request Form

3. OCHE Approvals Level I *(must be approved by the VCAA and Chancellor prior to CRC submission)*: Level I items are those requests for which the Board of Regents has fully designated approval authority to the institution or Commissioner of Higher Education. These requests are to be submitted for notification to or approval by Commissioner as Level I proposals. Level I proposals may be submitted to OCHE at any time by the flagship campuses or community colleges and will be processed on a rolling monthly schedule. The approval of such proposals will be conveyed to the Board of Regents at the next meeting of the board. Level I proposals include campus initiatives typically characterized by minimal costs, clear adherence to approved campus mission, and the absence of significant programmatic impact on other institutions within the MUS and community colleges. BOR Forms can be found using the following link: https://mus.edu/che/arsa/Forms/AcademicForms.html

☐ Re-titling an existing postsecondary educational program. Required Documents:
- ☐ Academic Proposal Request Form

☐ Terminating an existing postsecondary educational program.
- ☐ Academic Proposal Request Form
- ☐ Program Termination and Moratorium Form

☐ Consolidating existing postsecondary educational programs
- ☐ Academic Proposal Request Form
- ☐ Curriculum Proposal Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Establishing a new minor where there is a major or an option in a major
- ☐ Academic Proposal Request Form
- ☐ Curriculum Proposal Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Revising a postsecondary educational program
- ☐ Curriculum Proposal Form
- ☐ Academic Proposal Request Form

☐ Establishing a temporary C.A.S. or A.A.S. degree program Approval limited to 2 years
- ☐ Academic Proposal Request Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Other (for those that are considered in this level but otherwise not listed):

_____

- ☐ Academic Proposal Request Form

4. Level II *(must be approved by the VCAA and Chancellor prior to CRC submission)*:
Level II proposals require initial approval and comment by the Board of Regents through a Request to Plan prior to final review and approval by the Office of the Commissioner of Higher Education. These proposals entail more substantive additions to, alterations in, or termination of programs, structures, or administrative or academic entities typically characterized by the (a) addition, reassignment, or elimination or personnel, facilities, or courses of instruction; (b) rearrangement of budgets, cost centers, funding sources; and (c) changes which by implication could impact other MUS institutions and community colleges.

- ☐ Establishing a new postsecondary educational program
  - ☐ Academic Proposal Request Form
  - ☐ Curriculum Proposal
  - ☐ Completed Intent to Plan Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Permanent authorization for a temporary C.A.S. or A.A.S degree program
  - ☐ Academic Proposal Request Form
  - ☐ Curriculum Proposal
  - ☐ Completed Intent to Plan Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Exceeding the 120 credit maximum for baccalaureate degrees Exception to policy 301.11
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Forming, eliminating or consolidating an academic, administrative, or research unit
  - ☐ Academic Proposal Request Form
  - ☐ Curriculum or Center/Institute Proposal
  - ☐ Completed Request to Plan, except when eliminating or consolidating
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Re-titling an academic, administrative, or research unit Permanent authorization for a temporary C.A.S. or A.A.S degree program
- ☐ Curriculum Proposal
- ☐ Completed Intent to Plan Form

MontanaTech *Curriculum Change Request Form Dated August 15, 2020*

GeoE 440 Name change (from "Engineering Geology" to "Geological Engineering")

Date 2/24/24

Dept. Geological Engineering (Physics) **College** LCME

Program SME BS degrees **CRC Representative** G. Shaw

Description of Request: Phsx 235 Pre/Co-requisite adjustments

Current Course or Program Information: Phsx 235

Phsx 235 is currently the second course in the calculus-based physics sequence.

Number (Assigned By CRC):

Proposed Change

Course #	Name	Credits	Pre-req.
Phsx 235	**General Physics – Heat, Sound & Optics**	**3**	**Prereq:** M 172; PHSX 234; **Coreq:** none.

Current catalog description:

Second course in the calculus-based physics sequence. Includes the study of heat, sound, fluids and optics. Emphasizes problem-solving.

Prerequisite(s): M 172; PHSX 234; **Corequisite(s):** M 273. Course generally offered both semesters.

Adjusted description to read:

No change

Prerequisite(s): M 172; PHSX 234; **Corequisite(s):** none. Course generally offered both 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 (See Level of Request for Requirements:

Syllabus (lists course outcomes)

Assessment Leading to Request

The pre- and co-requisites for the calculus-based physics sequence have been evaluated periodically without much change. This academic year, as many of the engineering programs are revising their curricula to allow for more flexibility, the physics course requirements were discussed with the physics instructors to identify what other courses are really needed as pre-and co-requisites for students to succeed in the physics courses.

For Phsx 235, it was agreed that the pre-requisites should not change, but the co-requisite of M 273 Multivariable Calculus is not necessary.

Anticipated Impacts to "Other" Programs

The slight adjustments to the course description will not have any impacts on other programs.

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: 6/1/2023

MontanaTech *Curriculum Change Request Form Dated August 15, 2020*

GeoE 440 Name change (from "Engineering Geology" to "Geological Engineering")

APPROVALS

Department Head Approval _____
Date 2/29/24

Dean Approval _____
Date 2-29-24

Graduate Council Approval _____
Date _____

CRC Approval Tamara Harp
Date 03/07/2024

Faculty Senate Approval _____
Date _____

VCAA Approval (see below) _____
Date _____

Chancellor Approval (see below) _____
Date _____

PHSX 235 Heat, Sound & Optics
Spring 2024

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

Texts: Serway/Jewett (2019) *Physics For Scientists & Engineers* 10th Ed ***Required***

Lectures: M, W, & F 9:00-9:50, ELC 203
Lectures will follow the thread of the text, but new material will be presented, especially concerning practical applications and local examples.

Office Hours: M & W 10:00-11:50 AM MG 213E

Learning Outcomes:

1. Students will learn basic theory on fluid mechanics, harmonic motion, waves and sound, thermodynamics, and optics.
2. Students will learn how to quantitatively solve fluid mechanics, harmonic motion, waves and sound, thermodynamics, and optics problems
3. Students will learn about applications of fluid mechanics, harmonic motion, waves and sound, thermodynamics, and optics in multiple engineering disciplines

Lecture portion:

There will be (minimum two) midterms during lecture period and one Final Exam. Tested material will come from both the lecture and the reading assignments. The Final Exam will be cumulative.

Grading:

Homeworks (40%)
Lecture Exams (40%)
Final Exam (20%)

- No Extra credit will *be allowed to substitute for assignments*
- Missed exams can be made up with valid excuses; you must contact the teacher ***before*** the test begins. If you are sick, please don't come to class sick, but email or phone your teacher **before** class.

Restrictions:

- Cell phones or other communication devices shall not ring or be used during lectures.
- Hats, hoods, and scarves may not be worn during quizzes or tests.
- Cell phones and all electronic devices (other than calculators) must be turned off and stored during exams.
- Students may be given assigned seating for exams.
- Cheating will not be tolerated. Violation of this will result in a penalty of at least zero credit for each assignment. See the current catalog http://catalog.mtech.edu/content.php?catoid=3&navoid=655#ACADEMIC_DISHONESTY

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

International Students:

Montana Tech is committed to ensuring equal academic opportunities and inclusion for international students. You can contact Margie Pascoe if you have any questions regarding services that might be available to you. Margie can be reached at:

Margie Pascoe, Director International Services, Student Affairs, SSC 3.143
(406) 496-4477, mpascoe@mtech.edu

Disability Services:

Montana Tech is committed to providing students access to higher education through the delivery of reasonable accommodations and services to students with disabilities as required by law in Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act (ADA) of 1990 as amended (2008). Students with disabilities are encouraged to contact Amy Lorang to verify their eligibility for appropriate accommodations. I am also available to discuss appropriate academic accommodations that may be required. Joyce can be reached at:

Shauna Goodell, Disability Services and Accessibility Coordinator, SSC 3.137
(406) 496-4428, sgoodell@mtech.edu

MontanaTech *Curriculum Change Request Form Dated December 23, 2022*

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.

Final changes are made by the registrar after faculty senate approval and BOR approval, as needed.
See workflow document
https://helpx.adobe.com/acrobat/how-to/convert-word-excel-paper-pdf-forms.html?set=acrobat--fundamentals--pdf-forms
Guidance can be found at: https://mus.edu/che/arsa/academicproposals.html

Submission Requirements: All Submissions (checked by CRC):

- ■ Electronic Copy (with the exception of signatures- no handwritten items)
- ⊡ Completed CRC Form, with all Signatures and Attachments based on level of request (see below)
- ■ Naming Convention as determined by CRC

LEVEL of Request

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

1. *Faculty Approvals (directly to CRC, then Faculty Senate):*
   - ■ Establish a new course for the catalog (please contact the Registrar of MUS CCN information) Required Documents:
     - ■ Course Number
     - ■ Course Outcomes
     - ■ Course Description
     - ■ Syllabus
     - ■ Curriculum Worksheet
     - ■ Pre-requisite or co-requisite
   - ☐ Course Changes: addition, deletion or change of title, credit, course number, pre-req, description, or cross listing. Required Documents:
     - ■ Course Number
     - ■ Course Outcomes
     - ■ Course Description
     - ■ Syllabus
     - ☐ Pre-requisites or co-requisites
     - ■ Existing Curriculum Worksheet
     - ■ New Curriculum Worksheet, with changes highlighted
   - ■ 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. Required Documents:
     - ■ **Documents as listed under establishing a new course (as applicable)**
     - ■ Existing Curriculum Worksheet
     - ☐ New Curriculum Worksheet, with changes highlighted
   - ☐ Other (for those that are considered in this level but otherwise not listed):

     _____

2. *Campus Approvals Level I (must be approved by the VCAA prior to CRC submission):*
   - ☐ Placing a postsecondary educational program into moratorium: Required Documents:
     - ☐ Program Termination and Moratorium Form
     - ☐ Academic Proposal Request Form
   - ☐ Withdrawing a postsecondary educational program from moratorium. Required Documents:
     - ☐ Academic Proposal Request Form

- ☐ Establishing, re-titling, terminating or revising a campus certificate of 29 credits or fewer. Required Documents:
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Establishing a B.A.S./A.A./A.S. area of study. Required Documents:
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Offering an existing postsecondary educational program via distance or online delivery. Required Documents:
  - ☐ Academic Proposal Request Form

3. OCHE Approvals Level I *(must be approved by the VCAA and Chancellor prior to CRC submission)*:
Level I items are those requests for which the Board of Regents has fully designated approval authority to the institution or Commissioner of Higher Education. These requests are to be submitted for notification to or approval by Commissioner as Level I proposals. Level I proposals may be submitted to OCHE at any time by the flagship campuses or community colleges and will be processed on a rolling monthly schedule. The approval of such proposals will be conveyed to the Board of Regents at the next meeting of the board. Level I proposals include campus initiatives typically characterized by minimal costs, clear adherence to approved campus mission, and the absence of significant programmatic impact on other institutions within the MUS and community colleges. BOR Forms can be found using the following link:
https://mus.edu/che/arsa/Forms/AcademicForms.html

- ☐ Re-titling an existing postsecondary educational program. Required Documents:
  - ☐ Academic Proposal Request Form
- ☐ Terminating an existing postsecondary educational program.
  - ☐ Academic Proposal Request Form
  - ☐ Program Termination and Moratorium Form
- ☐ Consolidating existing postsecondary educational programs
  - ☐ Academic Proposal Request Form
  - ☐ Curriculum Proposal Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Establishing a new minor where there is a major or an option in a major
  - ☐ Academic Proposal Request Form
  - ☐ Curriculum Proposal Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Revising a postsecondary educational program
  - ☐ Curriculum Proposal Form
  - ☐ Academic Proposal Request Form
- ☐ Establishing a temporary C.A.S. or A.A.S. degree program Approval limited to 2 years
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**

4. Level II *(must be approved by the VCAA and Chancellor prior to CRC submission)*:
Level II proposals require initial approval and comment by the Board of Regents through a Request to Plan prior to final review and approval by the Office of the Commissioner of Higher Education. These proposals entail more substantive additions to, alterations in, or termination of programs, structures, or administrative or academic entities typically characterized by the (a) addition, reassignment, or elimination or personnel, facilities, or courses of instruction; (b) rearrangement of budgets, cost centers, funding sources; and (c) changes which by implication could impact other MUS institutions and community colleges.

- ☐ Establishing a new postsecondary educational program

- ☐ Request to Plan (RTP)
- ☐ Academic Proposal Request Form
- ☐ Curriculum Proposal
- ☐ Fiscal Analysis Form
- ☐ Completed Intent to Plan Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Permanent authorization for a temporary C.A.S. or A.A.S degree program

- ☐ Academic Proposal Request Form
- ☐ C.A.S/A.A.S Curriculum Proposal
- ☐ Fiscal Analysis Form
- ☐ Completed Intent to Plan Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Exceeding the 120 credit maximum for baccalaureate degrees Exception to policy 301.11

- ☐ Academic Proposal Request Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Forming, eliminating or consolidating an academic, administrative, or research unit

- ☐ Academic Proposal Request Form
- ☐ Curriculum or Center/Institute Proposal
- ☐ Completed Request to Plan, except when eliminating or consolidating
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Re-titling an academic, administrative, or research unit Permanent authorization for a temporary C.A.S. or A.A.S degree program

☐ Curriculum Proposal

☐ Completed Intent to Plan Form

MontanaTech *Curriculum Change Request Form Dated December 23, 2022*

Date 2/29/2024
Dept. Computer Science
College LCME
Program Software Engineering
CRC Representative Melissa Holmes

Description of Request:

Updating of curriculum, removing courses no longer taught, aligning with ABET requirements, providing clearer path to graduation, correcting prerequisites, introducing new course

Current Course or Program Information:

Number (Assigned By CRC):

Proposed Change

Course #	Name	Credits	Pre-req.

1. Replace CSCI 194 with EGEN 194
2. Add CSCI 102 as a first-year course (course already exists)
3. Simplify the science requirement to 8 hours from science core courses
4. Remove M 273 and 274
5. Add senior seminar/internship class Request CSCI 496, not in common course numbering. See syllabus below)

Course Information
Course Schedule: 3 credit/3 lecture hours per week

Course (Catalog) Description: Investigations in the Computer Science and Software Engineering fields. Students will report on their internship experience, present their senior design projects, and/or present their undergraduate research. Faculty and guest speakers will discuss current issues in computer science and software engineering.

Prerequisites: Senior standing or consent of the instructor
Co-requisites: None
Designation: Required

Course Outcomes:
1. Students develop professional and communication skills, including presenting technical information to a variety of audiences, preparing short elevator pitch type presentations and memos, and developing longer presentations.
2. Students develop research and technical skills by preparing a research presentation with a paper on their internship or on a current topic in computer science or software engineering.
3. Students learn about new and different areas of computer science by attending presentations and preparing work.
4. Students learn research and library skills by doing literature reviews and managing references.

6. Add a math/science elective
7. Require CSCI 447 (Machine Learning)
8. Remove CSCI 255 (Embedded systems)

Reasoning: This course is no longer going to be taught through the EELE or required for EELE students, and at this time we have no faculty available to teach it.

9. Add EELE 201/202 Circuits and Lab, and EELE 261 Intro to Logic Circuits
Reasoning: These courses add a good engineering foundation for software engineers and they also provide a good substitute for CSCI 255
10. Change ESOF 486 and ESOF 487 to 3 credit hours each
Prerequisite and catalog changes for existing courses
- CSCI 210: Change prerequisite to CSCI 135 or instructor's approval
- CSCI 361: Remove CSCI 255 as a prerequisite
- Update catalog description of CSCI 332 to include parallel processing.
- CSCI 347: Remove "CSCI 114 or CSCI 117". Retain CSCI 135 as prerequisite. Remove "CSCI 340 or BMIS 375."
- CSCI 443: Remove "course not offered unless COMX 338, Usability Testing, is not available." Change Corequisite of ESOF 322 to Prerequisite of CSCI 135.
- CSCI 444: Remove "CSCI 112 or CSCI 117". Retain CSCI 135 as prerequisite.
- CSCI 447: Remove CSCI 332, replace with CSCI 347.
- Update catalog description of CSCI 332 to include parallel processing and correct spelling

o Current: Covers several advanced data structures, including balanced search trees and graphs. Studies common algorithm design methods (Brute Force, Decrease and Conquer, Divide and Conquer, Greedy, and Dynamic Programming) to solve various classic problems. Emphasizes the space and time complexities of various data structures and their associated algorithms.
o Proposed: Covers several advanced data structures, including balanced search trees and graphs. Studies common algorithm design methods (Brute Force, Decrease and Conquer, Divide and Conquer, Greedy, Dynamic Programming, and Parallel Processing) to solve various classic problems. Emphasizes the space and time complexities of various data structures and their associated algorithms.

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

List of supporting documentation attached (See Level of Request for Requirements):

Assessment Leading to Request

This new curriculum was developed to enable students to have a clearer path to graduation, meet all ABET requirements for a degree in Software Engineering and have more options in electives to customize their degree plan. It is also more transfer friendly to students.

Anticipated Impacts to "Other" Programs

Possibly more enrollment in the EELE courses from SE students

Impact on Library: No consultation required has consulted with _____ 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 (note that the earliest date is the next calendar year): _____

APPROVALS

Department Head Approval _____
Date 2/29/24

Dean Approval _____
Date 2-29-24

Graduate Council Approval _____
Date _____

CRC Approval _____
Date 03/07/2024

Faculty Senate Approval _____
Date _____

VCAA Approval (see below) _____
Date _____

Chancellor Approval (see below) _____
Date _____

Year 1 Fall Semester		Tech requirements	ABET M/S (30)	ABET Eng (45)	Curriculum Req
Egen 194	1			1	
CSCI 135 - Fundamentals Of Computer Science I	3		3		1
M 171 - Calculus I	3	3 - math	3		
Humanities & Fine Arts Elective	3	3- hum			
WRIT 121/101	3	3- com			
CSCI 102	3	3 soc			1
	16				
Year 1 Spring Semester					
M 172 - Calculus II	3	math met (6 hours)	3		
Humanities & Fine Arts Elective	3	humanities met (6 hours)			
CSCI 210 - Web Programming	3				
CSCI 136 - Fundamentals Of Computer Science II	3		3		1
Social science elective	3	social science met 6 hours			
	15				
Year 2 Fall Semester					
CSCI 232 - Data Structures and Algorithms	3		2	1	2
Science core plus lab	4	4- scinece	4		
CSCI 443 - User Interface Design	3			3	2
CSCI 246 - Discrete Structures	3		3		7
	13				
Year 2 Spring Semester					
CSCI 332 - Design & Analysis of Algorithms	3		1	2	
M 333 - Matrices & Linear Algebra	3		3		
Science core plus lab	4	met (7 including lab) - same	4		
EELE 201	3				
EELE 202	1				
COMX 230 / COMX 111	3	communication met (6 hours)			
	17		3		
Year 3 Fall Semester					
EELE 261 - Intro to Logic Circuits (Fall only)	4			3	
ESOF 322 - Software Engineering	3		3		1
STAT 332 - Statistics for Scientists and Engineers	3			3	6
CSCI 347 - Data Mining	3		3		8
WRIT 321W/322W/325W - Advanced Writing	3	W course met		3	
	16				
Year 3 Spring Semester					
ESOF 376 - Engineering Secure Software	3			3	4
CSCI 361 - Computer Architecture	3			3	2
CSCI 440 - Database Systems	3			3	
Math/Science Elective	3		3		
ESOF 328 - Requirements and Specifications	3			3	5
	15				
Year 4 Fall Semester					
ESOF 486 Senior Design 1	3			3	
ESOF 427 - Software Design and Architecture	3			3	
CSCI 466 - Networks	3			3	
CSCI 464 - Seminar/Internship	3				
CS/SE/DS/ITS elective	3			3	
	15				
Year 4: Spring Semester					
ESOF 487 -Senior Design 2	3			3	
CSCI 460 - Operating Systems	3			3	1
CSCI 470 - Web Science	3		2	1	
CSCI 447 Machine Learning	3			3	
ESOF 411 Software Verification and Validation	3			3	5
	15		43	53	
Total credits					
	122				

Curriculum requirements key

1. Computing fundamentals
2. Software design and construction
3. Requiremets analysis
4. Security
5. Verification and validation
6. Software engineering processes and tools appropriate for the development of complex software systems
7. Discete mathmatics
8. Probability and statistics

Software Engineering

Freshman

Fall Semester

- CSCI 194 - Freshman Seminar *1 credit*
- Social Science Elective *3 credits*
- CSCI 135 - Fundamentals Of Computer Science I *3 credits*
- M 171 - Calculus I *3 credits*
- Humanities Elective *3 credits*
-
- WRIT 121 - Introduction To Technical Writing *3 credits*
- -OR-
- WRIT 101 - College Writing I *3 credits*

Total: 16

Spring Semester

- CSCI 136 - Fundamentals Of Computer Science II *3 credits*
- M 172 - Calculus II *3 credits*
- PHSX 234 - General Physics-Mechanics *3 credits*
- Humanities Elective *3 credits*
- CSCI 210 - Web Programming *3 credits*
-
- COMX 230 - Presenting Technical Information *3 credits*
- -OR-
- COMX 111 - Introduction to Public Speaking *3 credits*

Total: 18

Sophomore

Fall Semester

- CSCI 232 - Data Structures and Algorithms *3 credits*
- CSCI 246 - Discrete Structures *3 credits*
- M 273 - Multivariable Calculus *4 credits*
- PHSX 235 - General Physics-Heat, Sound & Optics *3 credits*
- PHSX 236 - General Phy-Heat, Sound & Optics Lab *1 credit*
- CSCI 443 - User Interface Design *3 credits*

Total: 17

Spring Semester

- CSCI 332 - Design & Analysis of Algorithms *3 credits*

- ECNS 203 - Principles of Micro and Macro *3 credits*
- M 274 - Introduction to Differential Equation *3 credits*
- PHSX 237 - General Physics-Electricity, Magnetism & Motion *3 credits*
- PHSX 238 - General Physics-Electricity, Magnetism & Motion Lab *1 credit*
- CSCI 255 - Introduction to Embedded Systems *3 credits*

Total: 16

Junior

Fall Semester

- CSCI 305 - Concepts of Programming Languages *3 credits*
- STAT 332 - Statistics for Scientists and Engineers *3 credits*
- Professional Elective *3 credits*
- ESOF 322 - Software Engineering *3 credits*
- CSCI 347 - Data Mining *3 credits*

Total: 15

Spring Semester

- CSCI 361 - Computer Architecture *3 credits*
- ESOF 328 - Requirements & Specifications *3 credits*
- CSCI 440 - Database Systems *3 credits*
-
- WRIT 321W - Advanced Technical Writing *3 credits*
- -OR-
- WRIT 322W - Advanced Business Writing *3 credits*
- -OR-
- WRIT 325W - Writing in the Sciences *3 credits*
-
- ESOF 376 - Engineering Secure Software *3 credits*

Total: 15

Senior

Fall Semester

- CSCI 466 - Networks *3 credits*
- ESOF 427 - Software Design & Architecture *3 credits*
- EGEN 325 - Engineering Economic Analysis *3 credits*
- ESOF 486 - Senior Design Project I *2 credits*
- Free Elective *2 credits*
- Professional Elective *3 credits*

Total: 16

Spring Semester

- CSCI 460 - Operating Systems *3 credits*
- CSCI 470 - Web Science *3 credits*
- ESOF 487 - Senior Design Project II *2 credits*
- ESOF 411 - Software Verification and Validation *3 credits*
- CSCI 494 - Senior Seminar *1 credit*
- Professional Elective *3 credits*

Total: 15

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

Computer Science Curriculum Changes Summary:

1. Replace CSCI 194 with EGEN 194

   Reasoning: Take advantage of an existing course that CS and SE faculty already participate in, free up faculty resources, and introduce some engineering problem solving

2. Add CSCI 102 as a first-year course (course already exists)

   Reasoning: Meet sociology requirement, take advantage of the dual enrollment nature of the course

3. Simplify the science requirement to 8 hours from science core courses

   Reasoning: Allow more options for students, reduce scheduling challenges

4. Remove M 273 and 274

   Reasoning: Not required by ABET, not prerequisites for CS or SE courses, and makes transfer agreements difficult

5. Fix the number of hours at 3 credit hours per semester for project/capstone sequence. Rename CSCI 499W to Capstone instead of Capstone: Data Science Project

   Reasoning: Meet ABET requirements for a Capstone experience, use a two-semester format to do a complete project, simplify scheduling and ensure consistent experience by fixing the number of credit hours, allow more flexibility of topic

6. Adjust M 417 (Topological data analysis) and CSCI 477 (Computer Modeling and Simulation) to the options in the required upper-level math elective. Both courses already exist. Remove M 426 from the list of options to meet this requirement.

   Reasoning: Adding CSCI 477 gives the CS department the opportunity to offer a course to meet this requirement, adding M 417 gives an option to students interested in data science. Remove M 426 from the list due to prerequisites and overlap with CSCI 477

7. Add senior seminar/internship class: Request CSCI 496, not in common course numbering. (New class 3 credit hours) See syllabus below.

   Reasoning: Compliance with internship rules, consistent class for both students with or without internships, improve presentation skills and present a variety of current topics.

8. Add a math/science elective

9. Require CSCI 447 (Machine Learning) and CSCI 443 (User Interface Design)

10. Remove any remaining language in catalog about concentrations

Software Engineering Curriculum Changes Summary

Software Engineering Curriculum Changes Summary

1. Replace CSCI 194 with EGEN 194
2. Add CSCI 102 as a first-year course (course already exists)
3. Simplify the science requirement to 8 hours from science core courses
4. Remove M 273 and 274
5. Add senior seminar/internship class Request CSCI 496, not in common course numbering.
6. Add a math/science elective
7. Require CSCI 447 (Machine Learning)
8. Remove CSCI 255 (Embedded systems)

   Reasoning: This course is no longer going to be taught through the EELE or required for EELE students, and at this time we have no faculty available to teach it.

9. Add EELE 201/202 Circuits and Lab, and EELE 261 Intro to Logic Circuits

   Reasoning: These courses add a good engineering foundation for software engineers and they also provide a good substitute for CSCI 255

10. Change ESOF 486 and ESOF 487 to 3 credit hours each

Prerequisite and catalog changes for existing courses

- CSCI 210: Change prerequisite to CSCI 135 or instructor's approval
- CSCI 361: Remove CSCI 255 as a prerequisite
- Update catalog description of CSCI 332 to include parallel processing.
- CSCI 347: Remove "CSCI 114 or CSCI 117". Retain CSCI 135 as prerequisite. Remove "CSCI 340 or BMIS 375."
- CSCI 443: Remove "course not offered unless COMX 338, Usability Testing, is not available." Change Corequisite of ESOF 322 to Prerequisite of CSCI 135.
- CSCI 444: Remove "CSCI 112 or CSCI 117". Retain CSCI 135 as prerequisite.
- CSCI 447: Remove CSCI 332, replace with CSCI 347.

- Update catalog description of CSCI 332 to include parallel processing and correct spelling
    - Current: Covers several advanced data structures, including balanced search trees and graphs. Studies common algorithm design methods (Brute Force, Decrease and Conquer, Divide and Conquer, Greedy, and Dynamic Programming) to solve various classic problems. Ehmphasizes the space and time complexitites of various data structures and their associated algorithms.
    - Proposed: Covers several advanced data structures, including balanced search trees and graphs. Studies common algorithm design methods (Brute Force, Decrease and Conquer, Divide and Conquer, Greedy, Dynamic Programming, and Parallel Processing) to solve various classic problems. Emphasizes the space and time complexities of various data structures and their associated algorithms.

CSCI 496 Senior Seminar/Internship

Department:	Computer Science
Course Schedule:	3 credit/3 lecture hours per week
Textbook:	None
Course (Catalog) Description:	Investigations in the Computer Science and Software Engineering fields. Students will report on their internship experience, present their senior design projects, and/or present their undergraduate research. Faculty and guest speakers will discuss current issues in computer science and software engineering,
Prerequisites:	Senior standing or consent of the instructor
Co-requisites:	None
Designation:	Required
Course Outcomes:	1. Students develop professional and communication skills, including presenting technical information to a variety of audiences, preparing short elevator pitch type presentations and memos, and developing longer presentations. **2.** Students develop research and technical skills by preparing a research presentation with a paper on their internship or on a current topic in computer science or software engineering. **3.** Students learn about new and different areas of computer science by attending presentations and preparing work. **4.** Students learn research and library skills by doing literature reviews and managing references.
Course Requirements:	Students taking this course will **1.** Propose a presentation topic of their choice and make a five-minute pitch to the class about the topic 2. Prepare and give a 20-minute presentation on this topic with references 3. Propose a second presentation topic either on their internship or one based on a literature review of a current research area in computer science or software engineering 4. Present a 30-minute presentation on this topic, along with a short paper. 5. Attend all other presentations and prepare a short evaluation and summary of each.

WEB PROGRAMMING (CSCI 210)

Department: Computer Science

Course Schedule: MWF 1:00-1:50 pm

Textbook: *Learning PHP, MySQL & JavaScript by Robin Nixon*

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Printed in the United States of America.

Published by O'Reilly Media, Inc., 1005 Gravenstein Highway North, Sebastopol, CA 95472.

978-1-492-09382-4

Course (Catalog) Description: Web Scripting teaches beginning and intermediate designers the fundamentals of creating complex Web applications. Students will install and configure MySQL, php and Apache to allow the involvement of dynamic web applications. With the knowledge and expe rience gained here, beginners will learn the fundamental concepts behind these technologies and more experienced developers will learn which technology works best for their specific needs. Exercises, questions, and projects are included with each chapter. Web designers will learn how to use PHP, MySQL, HTML together while picking up valuable web programming practices along the way.

Prerequisites: Prior to taking this class, students should have completed an intro to programming class, Oracle, or HTML.

Co-requisites: CSCI 135 or instructor's approval

Designation: Required

Course Outcomes:

- Understanding of database connectivity to service-side scripting
- Basic SQL commands (CRUD) and understanding relational databases.
- Server-side scripting using PHP
- User input validation using regular expressions and client-side scripting
- Sanitizing user input and preventing SQL injections
- Design and coding techniques for hash data
- Basic HTMl, CSS, and java Scripting integration into server-side scripting.
- Loading data into database tables from external data source (i.e. XML)
- Testing Methodology. Allows troubleshoot one problem at a time and test.

Computer Architecture (CSCI 361)

Department: Computer Science

Course Schedule: MWF 10:00-10:50 am

Contribution to Professional Component:

Textbook: Computer Organization and Design: The Hardware/Software Interface ARM Edition, by David A. Patterson and John L. Hennessy, ZyBook, required

Course (Catalog) Description: Studies the design and organization of computer systems, including the instruction set and interconnection of hardware components. Topics include computer performance, assembly language programming, microprocessor architecture, pipeline processing, memory and storage organization, and multiprocessor computers.

Prerequisites: CSCI 135

Co-requisites: N/A

Designation: Required

Course Outcomes:

R1. Students are familiar with historical developments in computer hardware and associated performance improvements.

R2. Students know how to evaluate hardware performance and are able to choose the best system or hardware design given a set of alternatives. (CS: 2, 6; SE: 2, 1)

R3. Students know the instruction set, for a specific architecture, including the different instruction formats, addressing modes and relationships to higher languages. (CS: 2)

R4. Students understand how procedures, pointers and arrays are implemented in assembly and machine code. (CS: 2)

R5. Students know the characteristics of a good instruction set. (CS: 2, 6)

R6. Students can research and present a recent computer architecture/system not covered in lecture. (CS: 3; SE: 3)

R7. Students understand how arithmetic and logic operations are designed and implemented. (CS: 2; SE: 1, 2)

R8. Students understand single cycle and pipelined datapaths and can modify either to implement additional instructions. (CS: 2, 6; SE: 2, 1)

R9. Students understand pipelining, its associated hazards and techniques to best handle hazards. (CS: 2, 6; SE: 1, 2)

R10. Students understand memory hierarchy, basics of caches, system buses, and how they affect computer performance. (CS: 2; SE: 1, 2)

R11. Students are familiar with different multiprocessor architectures. (CS: 2; SE: 1, 2)

Design and Analysis of Algorithms (CSCI 332)

Department: Computer Science

Textbook: *Introduction to the Design and Analysis of Algorithms, 3rd Ed*
Levitan, Anany
Pearson Education; 978-0-13-231681-1

Course (Catalog) Description: Covers several advanced data structures, including balanced search trees and graphs. Studies common algorithm design methods (Brute Force, Decrease and Conquer, Divide and Conquer, Greedy, Dynamic Programming, and Parallel Processing) to solve various classic problems. Emphasizes the space and time complexities of various data structures and their associated algorithms.

Prerequisites: CSCI 232, CSCI 246

Co-requisites:

Designation: Required

Course Outcomes:

- Students will know how to implement advanced data structures (hash table, balanced search tree, and/or a graph) using OOP design in a high-level programming language and use them in simple programs. (CS: 2, 5-a-4, 6; SE: 1, III-1-2-1)
- Students will be able to perform in-depth algorithm analysis, including average case efficiencies and Ω and θ asymptotic notations. (CS: 5-1, 1, 6; SE: 1, III-1-2-1)
- Students will know how to solve recurrences and use the Master Theorem for Divide and Conquer algorithms. (CS: 5-1, 1, 6; SE: 1, III-1-2-1)
- Students will understand different algorithm design techniques (Brute Force, Decrease and Conquer, Divide and Conquer, Greedy, and Dynamic Programming). (CS: 5-1, 2, 6; SE: 1, III-1-2-1)
- Students will be able to prove the correctness of an algorithm. (CS: 5-1, 6; SE: 1)
- Students will understand algorithms that solve classic problems, such as: sorting, knapsack, string processing, matrix multiplication, spanning trees, shortest paths, traveling salesperson, Huffman coding. (CS: 5-1, 2, 6; SE: 1, III-1-2-1)
- Students can identify and understand why some problems cannot be solved efficiently (NP problems). (CS: 5-1, 2, 6; SE: 1, III-1-2-1)

Data Mining (CSCI 347)

Department: Computer Science

Textbook: *Python Data Science Handbook by Jake VanderPlas*

Course (Catalog) Description: Provides a grounding in data mining techniques and prepares students to design, use, and evaluate these techniques in a variety of application domains and for the purpose of decision support. Topics include decision trees, rule-based systems, statistical approaches and instance based approaches.

Prerequisites: CSCI 135 (Fundamentals of CS I)

Co-requisites:

Designation: Selected Elective (Professional Elective)

Course Outcomes:

R1. Students can identify key characteristics of data mining and/or decision support projects, and can use these characteristics to choose appropriate data mining techniques.

R2. Students understand and can apply data preprocessing techniques appropriately.

R3. Students understand the underlying theory, biases, strengths, and weaknesses of different data mining techniques.

R4. Students understand and are able to apply measures of success to algorithm output, and can measure performance differences between algorithms.

R5. Students are able to use data mining algorithms including decision trees, rule based systems, statistical approaches, instance based approaches, linear techniques, and clustering, to both example data sets and real life data sets.

R6. Students have a firm grasp of supervised and unsupervised approaches to data mining and when to use each type.

CSCI 443 – User Interface Design

Department:	Computer Science
Course Schedule:	3 credits: 3 hours lecture per week
Textbook:	*UX for Beginners* by Joel Marsh
Course (Catalog) Description:	Provides an introduction to designing user interfaces for a variety of interactive systems. The design process emphasizes the development of software systems from a user, rather than system-oriented perspective. The course focuses on using real users to complete the specification, design, evaluation, and testing of the interface. Students will learn both human (cognitive) and technological tools for designing and building interfaces. The course also presents human-computer interaction concepts and theory, which involves computer science, psychology, social behavior, and other human factors associated with computer use.
Prerequisites:	CSCI 135
Co-requisites:	
Designation:	Required
Course Outcomes:	R1. Students understand the economic, social and environmental impact of poor user interfaces along with contemporary issues in usability. (SE: 2, 4) R2. Students can evaluate the usability of a user interface and discuss it in terms of design elements and human behaviors. (SE: 2) R3. Students completed an iterative, user-centered design process and are able to involve users in all phases of user interface development. (SE: 2, 3) R4. Students have designed, prototyped and evaluated a user interface. (SE: 1) R5. Students have developed and implemented an evaluation plan and used the results to improve a user interface. (SE: 1, 6)

Data Visualization (CSCI 444)

Department: Computer Science

Course Schedule: MWF 9:00-9:50 am

Course (Catalog) Description: Covers the principles, methods, and techniques for effective visual analysis of data. Students will use both common and special software packages to explore different visualization applications. Students will learn how to formulate 3-D numerical models, translate 3-D models into graphical displays, and create time sequences and pseudo-animations. The course covers interactive versus presentation techniques and special techniques for video, DVD, and other media displays

Prerequisites: CSCI 135 (Fundamentals of CS I)

Co-requisites:

Designation: Elective

Course Outcomes:

R1. Produce high quality visuals involving scatter plots, time series, contours, histograms, relational data, geographically distributed data, multi-component datasets, simulation output, 3-dimensional datasets and animations.

R2. Provide insights into how information is perceived, and how models of perception can be exploited to improve the quality of visualizations.

R3. Develop skills for the statistical analysis of data.

R4. Strengthen the students' programming and computer skills.

R5. Deliver a theoretical background sufficient for students to understand whatever visualization packages they may encounter in the future.

R6. Prepare the students for employment or graduate work in areas that employ visualizations to communicate information.

Machine Learning (CSCI 447)

Department: Computer Science

Course Schedule: MWF 10:00-10:50 am

Contribution to Professional Component:

Instructor: Douglas Galarus

Textbook: *Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow, 2nd Edition by Aurélien Géron*

Course (Catalog) Description: Introduction to the framework of learning from examples. Topics include various learning algorithms such as neural networks, Bayesian networks, and genetic algorithms, and generic learning principles such as bias/variance, MDL principle, and ethical considerations. Review statistical learning techniques, yet focuses on non-statistical techniques.

Prerequisites: CSCI 347 Data Mining

Co-requisites:

Designation: Required

Course Outcomes:

R1. Be comfortable with machine learning fundamentals including probability, linear algebra, data analysis, the overall machine learning process and general dimensions of machine learning problems

R2. Have reviewed the statistical techniques of regression, clustering and the nearest neighbor approach.

R3. Understand and be able to implement machine learning algorithms such as neural networks, Bayesian networks and genetic algorithms.

R4. Be able to discuss tradeoffs between different machine learning algorithms, hyperparameter selection heuristics, and bias/variance.

R5. Understand performance metrics and what measures to use to compare results from different models.

R6. Be able to identify and implement ensemble learning techniques.

R7. Be able to develop workable representations for the various approaches, and identify situations in which data manipulation must be used prior to learning.

R8. Understand ethical considerations and assumptions behind the development of a learned model.

Computational Modeling and Simulation (CSCI 477)

Department: Computer Science

Textbook: *Modeling and Simulation: Exploring Dynamic System Behavior, 2nd Ed*
Birta, Louis G.; Arbez Gilbert
Springer; 2195-2817

Introduction to Computation and Programming using Python: with Application to Understanding Data, 2nd Ed
Guttag, John V.
MIT Press; 978-0-262-52962-4

Course (Catalog) Description: Covers various computational modeling and simulation principles and techniques applicable to various domains of engineering and science. The course will rely on the python programming language and use frameworks such as PySim to explore topics in discrete event simulation; such as Apache Mesa to explore agent-based modeling; and SciPy to explore topics in continuous time simulation. Students will implement and apply these methods, including model verification and validation, to basic examples. Other topics include matrix languages, ODE solving, PDE solving, finite difference approximation, finite element methods, and visualize data generated from computer simulations.

Prerequisites: CSCI 135 and STAT 332

Co-requisites:

Designation: One of the three options to meet the upper level math requirement

Course Outcomes:

- Be familiar with the importance of modeling for science and engineering.
- Be able to identify different types of models and simulation.
- Be able to create a computer simulation of a set of observations based on the system's physical characteristics.
- Be able to solve both ordinary and partial differential equations with computers.
- Know how to verify and validate a computational model using data.
- Know how to construct a computer visualization of the model results.
- Understand the quality of the model and sources of errors.

CSCI 486 – Senior Project

Department: Computer Science

Designation: Required

Credit hours: 3

Course (Catalog) Description: Individual or small group pursuit of a project preferably an advanced topic in computing.

Prerequisites: Senior Standing or Consent of Instructor

Co-requisites: None

Textbook: None

Course Outcomes:

R1. The student will demonstrate the ability to apply knowledge of computing and mathematics acquired in their previous coursework to the solutions of research problem or a client project.

R2. The student will demonstrate the ability to analyze a problem and identify the appropriate computing requirements appropriate to its solutions. (CS: 1)

R3. The student will demonstrate the ability to design, implement and evaluate computer-based systems, processes, components, or programs to meet desired needs. (CS: 2)

R4. The student will recognize the need for, and demonstrate the ability to, engage in continuing professional development.

R5. The student will demonstrate the ability to use current techniques, skills, and tools necessary for computing practice, as appropriate to the problem or project.

R6. The student will demonstrate the ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices. (CS: 6)

R7. The student will demonstrate the ability to apply design and development principles in the construction of software of varying complexity.

Curriculum Review Committee

4/1/24

11 a.m.

https://us06web.zoom.us/j/89795214887

Proposals:

	College	Program	Proposal	Vote
1	LCME	BS Geo Eng	"Catalog housekeeping"	Pass
2	LCME	MS Geo Eng	"Catalog housekeeping"	Pass
3	LCME	UAV Cert	"Catalog housekeeping"	Pass, with rev.
4	HC	Auto Tech	Capstone Option	Pass
5	HC	Pre-App Line	Math and Credit changes	Pass
6	HC	Auto Tech Sprint	Sprint AAS	Pass
7	CLSPS	Biology	BIOH 201/202 changes	Pass, with rev.
8	CLSPS	Biology	BIOH 211/212 changes	Pass, with rev
9	CLSPS	Biology	BIOH 301/302 changes	Pass, with rev.
10	CLSPS	Biology	BIOH 311/312 changes	Pass, with rev.

MontanaTech *Curriculum Change Request Form Dated August 15, 2020*

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.

Final changes are made by the registrar after faculty senate approval and BOR approval, as needed.
See workflow document
https://helpx.adobe.com/acrobat/how-to/convert-word-excel-paper-pdf-forms.html?set=acrobat--fundamentals--pdf-forms
Guidance can be found at: https://mus.edu/che/arsa/academicproposals.html

Submission Requirements: All Submissions (checked by CRC):

- ■ Electronic Copy (with the exception of signatures- no handwritten items)
- ⊡ Completed CRC Form, with all Signatures and Attachments based on level of request (see below)
- ■ Naming Convention as determined by CRC

LEVEL of Request

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

1. *Faculty Approvals (directly to CRC, then Faculty Senate):*
   - ☐ Establish a new course for the catalog (please contact the Registrar of MUS CCN information) Required Documents:
     - ☐ Course Number
     - ☐ Course Outcomes
     - ☐ Course Description
     - ☐ Syllabus
     - ☐ Curriculum Worksheet
     - ☐ Pre-requisite or co-requisite
   - ■ Course Changes: addition, deletion or change of title, credit, course number, pre-req, description, or cross listing. Required Documents:
     - ■ Course Number
     - ☐ Course Outcomes
     - ■ Course Description
     - ☐ Syllabus
     - ■ Pre-requisites or co-requisites
     - ☐ Existing Curriculum Worksheet
     - ☐ New Curriculum Worksheet, with changes highlighted
   - ☐ 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. Required Documents:
     - ☐ **Documents as listed under establishing a new course (as applicable)**
     - ☐ Existing Curriculum Worksheet
     - ☐ New Curriculum Worksheet, with changes highlighted
   - ☐ Other (for those that are considered in this level but otherwise not listed):

     _____

2. *Campus Approvals Level I (must be approved by the VCAA prior to CRC submission):*
   - ☐ Placing a postsecondary educational program into moratorium: Required Documents:
     - ☐ Program Termination and Moratorium Form
     - ☐ Academic Proposal Request Form
   - ☐ Withdrawing a postsecondary educational program from moratorium. Required Documents:
     - ☐ Academic Proposal Request Form

- ☐ Establishing, re-titling, terminating or revising a campus certificate of 29 credits or more. Required Documents:
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Establishing a B.A.S./A.A./A.S. area of study. Required Documents:
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Offering an existing postsecondary educational program via distance or online delivery. Required Documents:
  - ☐ Academic Proposal Request Form

3. OCHE Approvals Level I *(must be approved by the VCAA and Chancellor prior to CRC submission)*:
Level I items are those requests for which the Board of Regents has fully designated approval authority to the institution or Commissioner of Higher Education. These requests are to be submitted for notification to or approval by Commissioner as Level I proposals. Level I proposals may be submitted to OCHE at any time by the flagship campuses or community colleges and will be processed on a rolling monthly schedule. The approval of such proposals will be conveyed to the Board of Regents at the next meeting of the board. Level I proposals include campus initiatives typically characterized by minimal costs, clear adherence to approved campus mission, and the absence of significant programmatic impact on other institutions within the MUS and community colleges. BOR Forms can be found using the following link:
https://mus.edu/che/arsa/Forms/AcademicForms.html

- ☐ Re-titling an existing postsecondary educational program. Required Documents:
  - ☐ Academic Proposal Request Form
- ☐ Terminating an existing postsecondary educational program.
  - ☐ Academic Proposal Request Form
  - ☐ Program Termination and Moratorium Form
- ☐ Consolidating existing postsecondary educational programs
  - ☐ Academic Proposal Request Form
  - ☐ Curriculum Proposal Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Establishing a new minor where there is a major or an option in a major
  - ☐ Academic Proposal Request Form
  - ☐ Curriculum Proposal Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Revising a postsecondary educational program
  - ☐ Curriculum Proposal Form
  - ☐ Academic Proposal Request Form
- ☐ Establishing a temporary C.A.S. or A.A.S. degree program Approval limited to 2 years
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**

4. Level II *(must be approved by the VCAA and Chancellor prior to CRC submission)*:
Level II proposals require initial approval and comment by the Board of Regents through a Request to Plan prior to final review and approval by the Office of the Commissioner of Higher Education. These proposals entail more substantive additions to, alterations in, or termination of programs, structures, or administrative or academic entities typically characterized by the (a) addition, reassignment, or elimination or personnel, facilities, or courses of instruction; (b) rearrangement of budgets, cost centers, funding sources; and (c) changes which by implication could impact other MUS institutions and community colleges.

- ☐ Establishing a new postsecondary educational program

- ☐ Request to Plan (RTP)
- ☐ Academic Proposal Request Form
- ☐ Curriculum Proposal
- ☐ Fiscal Analysis Form
- ☐ Completed Intent to Plan Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Permanent authorization for a temporary C.A.S. or A.A.S degree program

- ☐ Academic Proposal Request Form
- ☐ C.A.S/A.A.S Curriculum Proposal
- ☐ Fiscal Analysis Form
- ☐ Completed Intent to Plan Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Exceeding the 120 credit maximum for baccalaureate degrees Exception to policy 301.11

- ☐ Academic Proposal Request Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Forming, eliminating or consolidating an academic, administrative, or research unit

- ☐ Academic Proposal Request Form
- ☐ Curriculum or Center/Institute Proposal
- ☐ Completed Request to Plan, except when eliminating or consolidating
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Re-titling an academic, administrative, or research unit Permanent authorization for a temporary C.A.S. or A.A.S degree program

☐ Curriculum Proposal

☐ Completed Intent to Plan Form

MontanaTech *Curriculum Change Request Form Dated August 15, 2020*

Date 2/28/2024
Dept. Geological Engineering
College Lance College of Mines and Engineering
Program BS Geological Engineering
CRC Representative Mary MacLaughlin

Description of Request:

Catalog housekeeping: undergrad courses managed by the Dept of Geological Engineering

Current Course or Program Information:

There are no changes to the curriculum or courses. Just fixes and updates to reflect changes over the past several years.

Number (Assigned By CRC):

Proposed Change

Course #	Name	Credits	Pre-req.

GeoE 104 Introduction to Geological Engineering. Remove math prerequisite. A former faculty member used to do one assignment for this class that involved trigonometry, but that assignment has not been done for years. None of the current assignments (or any future envisioned assignments) will involve anything other than basic mathematical operations.

GeoE 298 Internship. The catalog lists this course as GeoE 238. Presumably a typo, as all internship courses end in the "98" digits.

GeoE 403 Structural Geology for Engineers. This used to have a separate prerequisite path for geophysical engineering students to take the course which is no longer needed. Also, we have acknowledged that students can be successful in this course with EGEN 305 as a co-requisite rather than a prerequisite. Adjust prerequisites to: Geo 101 (pre-requisite) and EGEN 305 (co-requisite).

GeoE 406 Geomorphology. Remove the Geo 257 prerequisite. This is a legacy from years past that is no longer viewed as necessary by the current faculty.

GeoE 409 Field Geology and Geophysics. Remove this course as it is no longer offered. We now offer Geo 429.

GeoE 410 Mining Geology. Catalog currently says offered 1st semester, but is offered 2nd semester.

GeoE 449 Field Geotechnical Engineering. Remove the phrase ("course generally offered in the summer") as the other field courses do not indicate this, and it has been pointed out by the director of enrollment services that it might be possible to offer this in a different way, during the fall or spring semester.

GeoE 499W Geological Engineering Design Project. Catalog says "generally offered both semesters" but due to staffing limitations, we have only been offering this once a year, and offering it in the fall provides more opportunity for fieldwork. Change wording to "generally offered 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 (See Level of Request for Requirements):

Assessment Leading to Request

Included in above descriptions.

Anticipated Impacts to "Other" Programs

None

Impact on Library: none has consulted with n/a 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 (note that the earliest date is the next calendar year): Calendar Year 2024/2025

APPROVALS

Department Head Approval Glenn Shaw
Date 2/29/24

Dean Approval
Date _____

Graduate Council Approval
Date _____

CRC Approval
Date _____

Faculty Senate Approval
Date _____

VCAA Approval (see below)
Date _____

Chancellor Approval (see below)
Date _____

MontanaTech *Curriculum Change Request Form Dated August 15, 2020*

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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See workflow document
https://helpx.adobe.com/acrobat/how-to/convert-word-excel-paper-pdf-forms.html?set=acrobat--fundamentals--pdf-forms
Guidance can be found at: https://mus.edu/che/arsa/academicproposals.html

Submission Requirements: All Submissions (checked by CRC):

- ■ Electronic Copy (with the exception of signatures- no handwritten items)
- ⊡ Completed CRC Form, with all Signatures and Attachments based on level of request (see below)
- ■ Naming Convention as determined by CRC

LEVEL of Request

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

1. *Faculty Approvals (directly to CRC, then Faculty Senate):*
   - ☐ Establish a new course for the catalog (please contact the Registrar of MUS CCN information) Required Documents:
     - ☐ Course Number
     - ☐ Course Outcomes
     - ☐ Course Description
     - ☐ Syllabus
     - ☐ Curriculum Worksheet
     - ☐ Pre-requisite or co-requisite
   - ■ Course Changes: addition, deletion or change of title, credit, course number, pre-req, description, or cross listing. Required Documents:
     - ■ Course Number
     - ☐ Course Outcomes
     - ■ Course Description
     - ☐ Syllabus
     - ■ Pre-requisites or co-requisites
     - ☐ Existing Curriculum Worksheet
     - ☐ New Curriculum Worksheet, with changes highlighted
   - ☐ 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. Required Documents:
     - ☐ **Documents as listed under establishing a new course (as applicable)**
     - ☐ Existing Curriculum Worksheet
     - ☐ New Curriculum Worksheet, with changes highlighted
   - ☐ Other (for those that are considered in this level but otherwise not listed):

     _____

2. *Campus Approvals Level 1 (must be approved by the VCAA prior to CRC submission):*
   - ☐ Placing a postsecondary educational program into moratorium: Required Documents:
     - ☐ Program Termination and Moratorium Form
     - ☐ Academic Proposal Request Form
   - ☐ Withdrawing a postsecondary educational program from moratorium. Required Documents:
     - ☐ Academic Proposal Request Form

- ☐ Establishing, re-titling, terminating or revising a campus certificate of 29 credits or more. Required Documents:
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Establishing a B.A.S./A.A./A.S. area of study. Required Documents:
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Offering an existing postsecondary educational program via distance or online delivery. Required Documents:
  - ☐ Academic Proposal Request Form

3. OCHE Approvals Level I *(must be approved by the VCAA and Chancellor prior to CRC submission)*:
Level I items are those requests for which the Board of Regents has fully designated approval authority to the institution or Commissioner of Higher Education. These requests are to be submitted for notification to or approval by Commissioner as Level I proposals. Level I proposals may be submitted to OCHE at any time by the flagship campuses or community colleges and will be processed on a rolling monthly schedule. The approval of such proposals will be conveyed to the Board of Regents at the next meeting of the board. Level I proposals include campus initiatives typically characterized by minimal costs, clear adherence to approved campus mission, and the absence of significant programmatic impact on other institutions within the MUS and community colleges. BOR Forms can be found using the following link:
https://mus.edu/che/arsa/Forms/AcademicForms.html

- ☐ Re-titling an existing postsecondary educational program. Required Documents:
  - ☐ Academic Proposal Request Form
- ☐ Terminating an existing postsecondary educational program.
  - ☐ Academic Proposal Request Form
  - ☐ Program Termination and Moratorium Form
- ☐ Consolidating existing postsecondary educational programs
  - ☐ Academic Proposal Request Form
  - ☐ Curriculum Proposal Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Establishing a new minor where there is a major or an option in a major
  - ☐ Academic Proposal Request Form
  - ☐ Curriculum Proposal Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Revising a postsecondary educational program
  - ☐ Curriculum Proposal Form
  - ☐ Academic Proposal Request Form
- ☐ Establishing a temporary C.A.S. or A.A.S. degree program Approval limited to 2 years
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**

4. Level II *(must be approved by the VCAA and Chancellor prior to CRC submission)*:
Level II proposals require initial approval and comment by the Board of Regents through a Request to Plan prior to final review and approval by the Office of the Commissioner of Higher Education. These proposals entail more substantive additions to, alterations in, or termination of programs, structures, or administrative or academic entities typically characterized by the (a) addition, reassignment, or elimination or personnel, facilities, or courses of instruction; (b) rearrangement of budgets, cost centers, funding sources; and (c) changes which by implication could impact other MUS institutions and community colleges.

- ☐ Establishing a new postsecondary educational program

- ☐ Request to Plan (RTP)
- ☐ Academic Proposal Request Form
- ☐ Curriculum Proposal
- ☐ Fiscal Analysis Form
- ☐ Completed Intent to Plan Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Permanent authorization for a temporary C.A.S. or A.A.S degree program

- ☐ Academic Proposal Request Form
- ☐ C.A.S/A.A.S Curriculum Proposal
- ☐ Fiscal Analysis Form
- ☐ Completed Intent to Plan Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Exceeding the 120 credit maximum for baccalaureate degrees Exception to policy 301.11

- ☐ Academic Proposal Request Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Forming, eliminating or consolidating an academic, administrative, or research unit

- ☐ Academic Proposal Request Form
- ☐ Curriculum or Center/Institute Proposal
- ☐ Completed Request to Plan, except when eliminating or consolidating
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Re-titling an academic, administrative, or research unit Permanent authorization for a temporary C.A.S. or A.A.S degree program

☐ Curriculum Proposal

☐ Completed Intent to Plan Form

MontanaTech *Curriculum Change Request Form Dated August 15, 2020*

Date 2/28/2024
Dept. Geological Engineering **College** Lance College of Mines and Engineering
Program BS/MS Geological Engineering **CRC Representative** Mary MacLaughlin

Description of Request:

Catalog housekeeping: graduate-level courses managed by the Dept of Geological Engineering

Current Course or Program Information:

There are no changes to the curriculum or courses. Just fixes and updates to reflect changes over the past several years.

Number (Assigned By CRC):

Proposed Change

Course #	Name	Credits	Pre-req.

GeoE 501 Montana Geology. Change to Geo 501 Montana Geology. This course was brought on board when Montana Tech ONLY used the GeoE prefix. With the common course numbering, we now use "Geo" also. We have just realized that this course should really be under the "Geo" prefix because it does not really contain any engineering content. No other MUS campuses use the Geo prefix for graduate courses, so this number will not duplicate anything offered at any other campus.

GeoE 541 Advanced Engineering Geology. Clarify prerequisites: GeoE 440 or graduate standing or consent of instructor.

GeoE 542 Slope Stability Analysis & Design. Adjust prerequisites: ECiv 486 or GeoE 440 or Min 467 or consent of instructor.

GeoE 548 Geotechnical Modeling. Clarify prerequisites: ECiv 486 or GeoE 440 or Min 467 or consent of instructor.

GeoE 581 Advanced Photogrammetric Modeling. Clarify prerequisites: GeoE 440 or GeoE 481 or consent of instructor.

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

List of supporting documentation attached (See Level of Request for Requirements):

Assessment Leading to Request

Included in above descriptions.

Anticipated Impacts to "Other" Programs

None

Impact on Library: none has consulted with n/a 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 (note that the earliest date is the next calendar year): Calendar Year 2024/2025

APPROVALS

Department Head Approval Glenn Shaw
Date 2/29/24

Dean Approval
Date _____

Graduate Council Approval
Date _____

CRC Approval
Date _____

Faculty Senate Approval
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VCAA Approval (see below)
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MontanaTech *Curriculum Change Request Form Dated August 15, 2020*

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See workflow document
https://helpx.adobe.com/acrobat/how-to/convert-word-excel-paper-pdf-forms.html?set=acrobat--fundamentals--pdf-forms
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Submission Requirements: All Submissions (checked by CRC):

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LEVEL of Request

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     - ☐ Existing Curriculum Worksheet
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     _____

2. *Campus Approvals Level I (must be approved by the VCAA prior to CRC submission):*
   - ☐ Placing a postsecondary educational program into moratorium: Required Documents:
     - ☐ Program Termination and Moratorium Form
     - ☐ Academic Proposal Request Form
   - ☐ Withdrawing a postsecondary educational program from moratorium. Required Documents:
     - ☐ Academic Proposal Request Form

- ☐ Establishing, re-titling, terminating or revising a campus certificate of 29 credits or more. Required Documents:
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
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☐ Curriculum Proposal

☐ Completed Intent to Plan Form

MontanaTech *Curriculum Change Request Form Dated August 15, 2020*

Date 2/28/2024
Dept. Geological Engineering
College Lance College of Mines and Engineering
Program UAV Certificate
CRC Representative Mary MacLaughlin

Description of Request:

Catalog housekeeping: UAS courses

Current Course or Program Information:

No changes to certificate or courses, just fixing prerequisites.

Number (Assigned By CRC):

Proposed Change

Course #	Name	Credits	Pre-req.

UAS 402 Basic Flight Lab. Clarify co-requisites: UAS 401 or consent of instructor.

~~UAS 494 and 594 UAS Seminar. Does catalog need to say "May be repeated for credit."?~~

UAS 499 and UAS 599 UAS Capstone. Add prerequisites: UAS 401 and UAS 402, or consent of instructor.

UAS 502 Advanced Flight Lab. Clarify co-requisites: UAS 401 and UAS 402, or consent of instructor.

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

List of supporting documentation attached (See Level of Request for Requirements):

Assessment Leading to Request

As we begin to offer these courses, we are learning what the correct prerequisites should be.

Anticipated Impacts to "Other" Programs

None

Impact on Library: none has consulted with n/a 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 (note that the earliest date is the next calendar year): Calendar Year 2024/2025

APPROVALS

Department Head Approval Glenn Shaw
Date 2/29/24

Dean Approval
Date _____

Graduate Council Approval
Date _____

CRC Approval
Date _____

Faculty Senate Approval
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VCAA Approval (see below)
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LEVEL of Request

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   X Establish a new course for the catalog (please contact the Registrar of MUS CCN information) Required Documents:
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   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. Required Documents:
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   ☐ Other (for those that are considered in this level but otherwise not listed):

   _____

2. *Campus Approvals Level I (must be approved by the VCAA prior to CRC submission):*

   Placing a postsecondary educational program into moratorium: Required Documents:
   - Program Termination and Moratorium Form
   - Academic Proposal Request Form

   ☐ Withdrawing a postsecondary educational program from moratorium. Required Documents:
   - ☐ Academic Proposal Request Form

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- ☐ Establishing a temporary C.A.S. or A.A.S. degree program Approval limited to 2 years
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  - ☐ **Documents as listed under establishing a new course (see section 1)**

- ☐ Other (for those that are considered in this level but otherwise not listed):

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- ☐ Academic Proposal Request Form

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- ☐ Establishing a new postsecondary educational program
  - ☐ Academic Proposal Request Form
  - ☐ Curriculum Proposal
  - ☐ Completed Intent to Plan Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Permanent authorization for a temporary C.A.S. or A.A.S degree program
  - ☐ Academic Proposal Request Form
  - ☐ Curriculum Proposal
  - ☐ Completed Intent to Plan Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Exceeding the 120 credit maximum for baccalaureate degrees Exception to policy 301.11
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- ☐ Curriculum Proposal
- ☐ Completed Intent to Plan Form

MontanaTech *Curriculum Change Request Form Dated August 15, 2020*

Date 2/13/24
Dept. Trades and Technology **College** Highlands College
Program: Automotive Technology

CRC Representative Linda Granger

Description of Request: Add AST 299 Automotive Capstone as an option with the AST 298 so students can either complete the Capstone or the Internship in the Automotive Technology Associate of Applied Science. Realign Automotive Technology courses to ensure the students receive training on electrical systems and engine repair earlier in the curriculum.

Current Course or Program Information: Currently only AST 298 Automotive Internship is approved in the second year of the AAS. Electrical systems and engine repair are currently taken the second year. These two courses need to be taken in the first year so that the content covered can be applied appropriately in the second year courses.

Number (Assigned By CRC): _____

Proposed Change

Course #	Name	Credits	Pre-req.
Add AST 299	Automotive Capstone	1-6 variable	**Pre-Reqs**: AST 102, AST 118, AST 119, AST 160, AST 161, AST 136, AST 137, AST 166, AST 167, AST 172, DST 260, DST 265 **Co-Reqs:** AST 230, AST 270/271

Course Outcomes
Students will demonstrate safe and appropriate use of tools, machines, and materials in automotive technology.
Students will communicate and collaborate with others to accomplish tasks and develop solutions to problems and opportunities.
Students will demonstrate effective decision-making, problem-solving and goal setting.
Students will demonstrate appropriate use and application of automotive technology concepts.
Students will demonstrate the ability to use symbols, measurements and schematics to build, test, and troubleshoot various automobile problems.

Automotive Technology AAS
Curriculum Sheet
Effective Fall 24-25

Course Number	Title	Credits	Semester Completed
	FIRST SEMESTER		
AST 102	Introduction to Automotive Service	3	
AST 118	Brakes & Chassis	3	
AST 119	Brakes & Chassis Lab	3	
AST 136	Automotive Electrical Systems - Lecture	3	
AST 137	Automotive Electrical Systems - Lecture	3	

M 111 OR	Technical Mathematics (recommended for students who plan on only completing the CAS or AAS)	3
M 105 OR	Contemporary Mathematics (recommended for students who plan on pursuing a BAS degree)	
M 121	College Algebra (recommended for students who plan on pursuing a BAS degree)	
Total Credits		**18**
	SECOND SEMESTER	
AST 160	Automotive Engine Repair - Lecture	3
AST 161	Automotive Engine Repair - Lab	3
AST 166	Engine Performance & Diagnostics	3
AST 167	Engine Performance & Diagnostics Lab	3
WRIT 100 OR	Composing Mindfully: Writing Fundamentals (recommended section specifically for Trades Programs students who plan on only completing the CAS or AAS)	3
WRIT 101 OR	College Writing I (recommended for students who plan on pursuing a BAS degree)	
Writ 121	Introduction to Technical Writing (recommended for students who plan on pursuing a BAS degree)	
Total Credits		**15**
	EXIT POINT FOR CERTIFICATE OF APPLIED SCIENCE AUTOMOTIVE TECHNOLOGY	
	THIRD SEMESTER	
DST 260	Diesel Engine Diagnostic Troubleshooting	3
DST 265	Applied Lab Experience	3
AST 172	Automotive Air Conditioning – Lecture/Lab	3
CAPP 131 OR	Basic MS Office	3
CAPP 156	MS Excel	
Total Credits		**12**
	FOURTH SEMESTER	
AST 298 OR AST 299	Automotive Internship OR Automotive Capstone	1-6 credits (Variable)
AST 230	Electrical/Electronics Systems II (Lecture/Lab)	4
AST 270	Automatic Transmissions & Transaxles - Lecture	3
AST 271	Automatic Transmissions & Transaxles – Lab	3
COMX 115 OR	Introduction to Interpersonal Communication (recommended for students who plan on only completing the AAS)	3
BGEN 235	Business Law (recommended for students who plan on pursuing a BAS degree)	3
BGEN 105	Introduction to Business	3
Total Credits		**17**
	TOTAL MINIMUM CREDITS FOR FOUR SEMESTERS	**62**

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

List of supporting documentation attached (See Level of Request for Requirements): N/A

AST 299 Automotive Capstone course syllabus
Current curriculum sheet from 23-24 catalog
Proposed curriculum sheet for AYE 24-25

Assessment Leading to Request Due to limited capacity in local internships and place bound students, the addition of the capstone allows students an additional option to demonstrate readiness for employment as an automotive technician.

The curriculum realignment is needed because the content covered in the AST 136/137 Electrical Systems and AST 160/161 Engine Repair courses is necessary for the AST 172, AST 230 and AST 270/271 courses. In the current curriculum students the instructors are having to teach the missing content in addition to the actual course content.

Anticipated Impacts to "Other" Programs None

Impact on Library: None

Date to take effect: Fall 2024

APPROVALS

Department Chair Approval Jim LaMoure
Date 3-12-2024

Dean Approval Karen VanDamme
Date 3-12-2024

Graduate Council Approval _____
Date _____

CRC Approval _____
Date _____

Faculty Senate Approval _____
Date _____

VCAA Approval (see below) _____
Date _____

Chancellor Approval (see below) _____
Date _____

HIGHLANDS COLLEGE
OF MONTANA TECH

AST 299 Automotive Capstone
Term:
CRN:
Credits: 1-6 (variable)

Instructor:
Office:
Telephone:
Email:

Course Description
This course covers advanced automotive technology topics. This a capstone course which prepares students for entry into the automotive industry as an automotive technician. Students will perform advanced level diagnosis and repair of automobiles.

Course Outcomes
- Students will demonstrate safe and appropriate use of tools, machines, and materials in automotive technology.
- Student will communicate and collaborate with others to accomplish tasks and develop solutions to problems and opportunities.
- Students will demonstrate effective decision-making, problem solving and goal setting.
- Students will demonstrate, appropriate use and application of automotive technology concepts.
- Students will demonstrate the ability to use symbols, measurements and schematics to build, test, and troubleshoot various automobile problems.

Required Materials
No book is required for this course
Laptop computer
Basic hand tools

Course Policies & Procedures
- You will not be allowed in the shop if you do not meet all the requirements for safety and academic rules.
- Students are not to use any tools or equipment if they are not qualified and do not have the teacher's approval.
- Students are not allowed to drive a vehicle without a valid Driver's License.
- Tools need to be checked out and back in. The person on the checkout sheet is the person who is solely responsible.
- The work area must be clean and free of clutter.
- Safety glasses must be worn in the shop.

HIGHLANDS COLLEGE
OF MONTANA TECH

Student with Disabilities
Students with disabilities who believe they may need accommodations in this class are encouraged to contact the Disabilities Services Office at (406) 496-4428 or online https://www.mtech.edu/academics/services/disability/index.html at the earliest possible date.

Assignment and Assessments

- Assignments must be approved by the instructor.
- Assignments must be relevant to the automotive industry.
- Must be able to obtain all supplies needed to complete the project.
- Must be completed by the end of the semester.

Grading

- Instructor takes expectations and individual skill levels into consideration.
- Instructor considers advice from local workforce pertaining to expected shop performance.
- Instructor can adjust grade according to assignment due date.

Automotive Technology AAS
Curriculum Sheet
Effective Fall 24-25

Students planning on completing ONLY the Certificate of Applied Science or the Associate of Applied Science in Automotive Technology will complete the Elective courses in GREEN.
Students planning on continuing beyond the Associate of Applied Science and completing the Bachelor of Applied Science in Business MUST complete the Elective courses in ORANGE.

Course Number	Title	Credits	Semester Completed
	FIRST SEMESTER		
AST 102	Introduction to Automotive Service	3	
AST 118	Brakes & Chassis	3	
AST 119	Brakes & Chassis Lab	3	
AST 160	Automotive Engine Repair (Lecture)	3	
AST 161	Automotive Engine Repair (Lab)	3	
M 111 OR	Technical Mathematics (recommended for students who plan on only completing the CAS or AAS)	3	
M 105 OR	Contemporary Mathematics (recommended for students who plan on pursuing a BAS degree)		
M 121	College Algebra (recommended for students who plan on pursuing a BAS degree)		
Total Credits		**18**	
	SECOND SEMESTER		
AST 136	Automotive Electrical/Electronics Systems	3	
AST 137	Automotive Electrical/Electronics Systems Lab	3	
AST 166	Engine Performance & Diagnostics	3	
AST 167	Engine Performance & Diagnostics Lab	3	
WRIT 100 OR	Composing Mindfully: Writing Fundamentals (recommended section specifically for Trades Programs students who plan on only completing the CAS or AAS)	3	
WRIT 101 OR	College Writing I (recommended for students who plan on pursuing a BAS degree)		
Writ 121	Introduction to Technical Writing (recommended for students who plan on pursuing a BAS degree)		
Total Credits		**15**	
	EXIT POINT FOR CERTIFICATE OF APPLIED SCIENCE AUTOMOTIVE TECHNOLOGY		
	THIRD SEMESTER		
DST 260	Diesel Engine Diagnostic Troubleshooting	3	
DST 265	Applied Lab Experience	3	
AST 270	Automatic Transmissions and Transaxles	3	
AST 271	Automatic Transmissions and Transaxles Lab	3	

CAPP 131 OR	Basic MS Office	3
CAPP 156	MS Excel	
Total Credits		**15**
	FOURTH SEMESTER	
AST 298 OR AST 299	Automotive Internship OR Automotive Capstone	1-6 credits (Variable)
AST 230	Electrical/Electronics Systems II (Lecture/Lab)	4
AST 172	Automotive Air Conditioning (Lecture/Lab)	3
COMX 115 OR	Introduction to Interpersonal Communication (recommended for students who plan on only completing the AAS)	3
BGEN 235	Business Law (recommended for students who plan on pursuing a BAS degree)	3
BGEN 105	Introduction to Business	3
Total Credits		**14**
	TOTAL MINIMUM CREDITS FOR FOUR SEMESTERS	**62**

Automotive Technology AAS
Curriculum Sheet
Effective Fall 23-24

Students planning on completing **ONLY** the Certificate of Applied Science or the Associate of Applied Science in Automotive Technology will complete the Elective courses in **GREEN.**

Students planning on continuing beyond the Associate of Applied Science and completing the Bachelor of Applied Science in Business **MUST** complete the Elective courses in **ORANGE.**

Course Number	Title	Credits	Semester Completed
	FIRST SEMESTER		
AST 102	Introduction to Automotive Service	3	
AST 118	Brakes & Chassis	3	
AST 119	Brakes & Chassis Lab	3	
AST 136	Automotive Electrical Systems (Lecture)	3	
AST 137	Automotive Electrical Systems (Lab)	3	
M 111 **OR**	Technical Mathematics (recommended for students who plan on only completing the CAS or AAS)	3	
M 105 **OR**	Contemporary Mathematics (recommended for students who plan on pursuing a BAS degree)		
M 121	College Algebra (recommended for students who plan on pursuing a BAS degree)		
Total Credits		**18**	
	SECOND SEMESTER		
AST 160	Automotive Engine Repair (Lecture)	3	
AST 161	Automotive Engine Repair (Lab)	3	
AST 166	Engine Performance & Diagnostics	3	
AST 167	Engine Performance & Diagnostics Lab	3	
WRIT 100 **OR**	Composing Mindfully: Writing Fundamentals (recommended section specifically for Trades Programs students who plan on only completing the CAS or AAS)	3	
WRIT 101 **OR**	College Writing I (recommended for students who plan on pursuing a BAS degree)		
Writ 121	Introduction to Technical Writing (recommended for students who plan on pursuing a BAS degree)		
Total Credits		**15**	
	EXIT POINT FOR CERTIFICATE OF APPLIED SCIENCE AUTOMOTIVE TECHNOLOGY		
	THIRD SEMESTER		
DST 260	Diesel Engine Diagnostic Troubleshooting	3	
DST 265	Applied Lab Experience	3	
AST 172	Automotive Air Conditioning (Lecture/Lab)	3	
CAPP 131 **OR**	Basic MS Office	3	
CAPP 156	MS Excel		
Total Credits		**12**	

FOURTH SEMESTER		
AST 298 OR AST 299	Automotive Internship OR Automotive Capstone	1-6 credits (Variable)
AST 230	Electrical/Electronics Systems II (Lecture/Lab)	4
AST 270	Automatic Transmissions & Transaxles Lecture	3
AST 271	Automatic Transmissions & Transaxles Lab	3
COMX 115 **OR**	Introduction to Interpersonal Communication (recommended for students who plan on only completing the AAS)	3
BGEN 235	Business Law (recommended for students who plan on pursuing a BAS degree)	
BGEN 105	Introduction to Business	3
Total Credits		**17**
	TOTAL CREDITS FOR FOUR SEMESTERS	**62**

*ACTG 201 Principles of Financial Accounting is recommended for students who plan on pursuing a BAS degree and will need to be completed prior to AAS completion.

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.

Final changes are made by the registrar after faculty senate approval and BOR approval, as needed.
See workflow document
https://helpx.adobe.com/acrobat/how-to/convert-word-excel-paper-pdf-forms.html?set=acrobat--fundamentals--pdf-forms
Guidance can be found at: https://mus.edu/che/arsa/academicproposals.html

Submission Requirements: All Submissions (checked by CRC):

- ☐ Electronic Copy (with the exception of signatures- no handwritten items)
- ☐ Completed CRC Form, with all Signatures and Attachments based on level of request (see below)
- ☐ Naming Convention as determined by CRC

LEVEL of Request

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

1. *Faculty Approvals (directly to CRC, then Faculty Senate):*
   - ☐ Establish a new course for the catalog (please contact the Registrar of MUS CCN information) Required Documents:
     - ☐ Course Number
     - ☐ Course Outcomes
     - ☐ Course Description
     - ☐ Syllabus
     - ☐ Curriculum Worksheet
     - ☐ Pre-requisite or co-requisite
   - X Course Changes: addition, deletion or change of title, credit, course number, pre-req, description, or cross listing. Required Documents:
     - ☐ Course Number
     - ☐ Course Outcomes
     - ☐ Course Description
     - ☐ Syllabus
     - ☐ Pre-requisites or co-requisites
     - ☐ Existing Curriculum Worksheet
     - ☐ New Curriculum Worksheet, with changes highlighted
   - 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. Required Documents:
     - ☐ **Documents as listed under establishing a new course (as applicable)**
     - ☐ Existing Curriculum Worksheet
     - ☐ New Curriculum Worksheet, with changes highlighted
   - ☐ Other (for those that are considered in this level but otherwise not listed):

     _____

2. *Campus Approvals Level I (must be approved by the VCAA prior to CRC submission):*
   Placing a postsecondary educational program into moratorium: Required Documents:
   Program Termination and Moratorium Form
   Academic Proposal Request Form
   - ☐ Withdrawing a postsecondary educational program from moratorium. Required Documents:
     - ☐ Academic Proposal Request Form

- ☐ Establishing, re-titling, terminating or revising a campus certificate of 29 credits or more. Required Documents:
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Establishing a B.A.S./A.A./A.S. area of study. Required Documents:
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Offering an existing postsecondary educational program via distance or online delivery. Required Documents:
  - ☐ Academic Proposal Request Form
- ☐ Other (for those that are considered in this level but otherwise not listed):

  _____
  - ☐ Academic Proposal Request Form

3. OCHE Approvals Level I *(must be approved by the VCAA and Chancellor prior to CRC submission)*: Level I items are those requests for which the Board of Regents has fully designated approval authority to the institution or Commissioner of Higher Education. These requests are to be submitted for notification to or approval by Commissioner as Level I proposals. Level I proposals may be submitted to OCHE at any time by the flagship campuses or community colleges and will be processed on a rolling monthly schedule. The approval of such proposals will be conveyed to the Board of Regents at the next meeting of the board. Level I proposals include campus initiatives typically characterized by minimal costs, clear adherence to approved campus mission, and the absence of significant programmatic impact on other institutions within the MUS and community colleges. BOR Forms can be found using the following link: https://mus.edu/che/arsa/Forms/AcademicForms.html

- ☐ Re-titling an existing postsecondary educational program. Required Documents:
  - ☐ Academic Proposal Request Form
- ☐ Terminating an existing postsecondary educational program.
  - ☐ Academic Proposal Request Form
  - ☐ Program Termination and Moratorium Form
- ☐ Consolidating existing postsecondary educational programs
  - ☐ Academic Proposal Request Form
  - ☐ Curriculum Proposal Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Establishing a new minor where there is a major or an option in a major
  - ☐ Academic Proposal Request Form
  - ☐ Curriculum Proposal Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Revising a postsecondary educational program
  - ☐ Curriculum Proposal Form
  - ☐ Academic Proposal Request Form
- ☐ Establishing a temporary C.A.S. or A.A.S. degree program Approval limited to 2 years
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**

- ☐ Other (for those that are considered in this level but otherwise not listed):

  _____

- ☐ Academic Proposal Request Form

4. Level II *(must be approved by the VCAA and Chancellor prior to CRC submission)*:
Level II proposals require initial approval and comment by the Board of Regents through a Request to Plan prior to final review and approval by the Office of the Commissioner of Higher Education. These proposals entail more substantive additions to, alterations in, or termination of programs, structures, or administrative or academic entities typically characterized by the (a) addition, reassignment, or elimination or personnel, facilities, or courses of instruction; (b) rearrangement of budgets, cost centers, funding sources; and (c) changes which by implication could impact other MUS institutions and community colleges.

- ☐ Establishing a new postsecondary educational program
  - ☐ Academic Proposal Request Form
  - ☐ Curriculum Proposal
  - ☐ Completed Intent to Plan Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Permanent authorization for a temporary C.A.S. or A.A.S degree program
  - ☐ Academic Proposal Request Form
  - ☐ Curriculum Proposal
  - ☐ Completed Intent to Plan Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Exceeding the 120 credit maximum for baccalaureate degrees Exception to policy 301.11
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Forming, eliminating or consolidating an academic, administrative, or research unit
  - ☐ Academic Proposal Request Form
  - ☐ Curriculum or Center/Institute Proposal
  - ☐ Completed Request to Plan, except when eliminating or consolidating
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Re-titling an academic, administrative, or research unit Permanent authorization for a temporary C.A.S. or A.A.S degree program
- ☐ Curriculum Proposal
- ☐ Completed Intent to Plan Form

MontanaTech *Curriculum Change Request Form Dated August 15, 2020*

Date February 29, 2024
Dept. Business & Industry **College** Highlands College
Program: Pre-Apprentice Line Program

CRC Representative Linda Granger

Description of Request:

- Removal of Line 110 Math for the Utility Industry
- Add M 111 Technical Mathematics
- Increase Line 100 Introduction to the Utility Industry from 2 credits to 4
- Increase Line 140 Pole Yard from 16 credits to 17 credits

Current Course or Program Information:

Current Curriculum

Line 110 Math for the Utility Industry	6
Line 100 Introduction to the Utility Industry	2
Line 120 Electrical For the Utility Industry	3
Line 130 Safety and Certifications	3
Line 140 Pole Yard	16
TOTAL CREDITS	30

Number (Assigned By CRC): _____

Proposed Change

Course #	Name	Credits	Pre-req.

Proposed Curriculum beginning Fall 2024

SEMESTER

M 111 Technical Mathematics	3
Line 100 Introduction to the Utility Industry	4
Line 120 Electrical For the Utility Industry	3
Line 130 Safety and Certifications	3
Line 140 Pole Yard	17
TOTAL CREDITS	30

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

List of supporting documentation attached (See Level of Request for Requirements): N/A

Updated Line 100 Introduction to the Utility Industry Syllabus
Updated Line 140 Pole Yard Syllabus
2023-2024 Pre-Apprentice Line Program Sheet
Proposed Curriculum Sheet

Assessment Leading to Request

A review of the current curriculum as well as industry requirements for entry in to line apprenticeships identified the need to update the curriculum. The math required for the Line trade is 3 credits of Technical or Trades related Mathematics. In addition, the instructors recognized the need to include more curriculum related to the identification and use of hand tools and equipment. The decision was made to utilize the M 111 Technical Mathematics for the course and expand the Line 100 Introduction to the Utility Industry to four credits to allow for the inclusion of the hand tool content and additional credit to the Line 140 Pole Yard for additional time on heavy equipment training.

Anticipated Impacts to "Other" Programs Dean Vandaveer worked with Dr. Hilary Riser to identify an instructor to teach the M 111 Technical Mathematics. The instructor will be paid for out of the Highlands College adjunct budget so that the other math courses will not be impacted.

Impact on Library: None

Date to take effect: Fall 2024

APPROVALS

Department Chair Approval Linda Grenger
Date 3-12-2024

Dean Approval Karen VanDaveer
Date 3-12-24

Graduate Council Approval _____
Date _____

CRC Approval _____
Date _____

Faculty Senate Approval _____
Date _____

VCAA Approval (see below) _____
Date _____

Chancellor Approval (see below) _____
Date _____

Pre-Apprentice Line Program
Curriculum Sheet
Effective Fall 24-25

Course Number	Title	Credits	Semester Completed
	SEMESTER		
M 111	Technical Mathematics	3	
Line 100	Introduction to the Utility Industry	4	
Line 120	Electrical For the Utility Industry	3	
Line 130	Safety and Certifications	3	
Line 140	Pole Yard	17	
	TOTAL CREDITS	**30**	

Student ID:_____
Student Name:_____
Adviser Name:_____

Catalog: 2023-2024 Catalog
Program: Pre-Apprentice Line Program
Minimum Credits Required:_____

Pre-Apprentice Line Program

This one-semester certificate program prepares students to be successful in applying for groundmen and apprentice positions within the line trade. It was developed in response to a nation-wide shortage of skilled line workers. A recent survey of the National utility industry indicates that there will be a significant need for new apprentice positions each year. Individuals holding skills offered by this training for the next decade will help keep up with industry needs.

The program has a limited number of spots available. Admission to Highlands College does **not** guarantee admission to the Pre-Apprentice Line Program. The following criteria must be met before admission will be granted to the Pre-Apprentice Line Program.

1. **Application.** Initial admission to the program is based on a first-come/first-served process. The first individuals who apply for a specific semester will have a slot reserved pending submission of the remaining items listed below (numbers 2-5).
2. **Department of Transportation (DOT) physical examination.** Applicants must complete and pass the DOT physical. Applicants should contact their personal physician to fulfill this requirement. A copy of the completed DOT examination form must be submitted to the Admissions office (address below). **Please keep your original card**
3. **Age.** Applicants must be at least 18 years of age before the first 2 weeks of the semester of study are complete.
4. Official Transcripts. Currently enrolled high school students can reserve their spot by submitting an unofficial high school transcript. However, an official high school transcript must be submitted immediately after graduation. Otherwise, the student risks losing his or her spot. All students who have received college credit at another college or university must submit official transcripts from that institution. Unofficial transcripts can be submitted for courses that are currently in-progress but official ones must be sent to MT Tech after course completion.

These items must be submitted to the Montana Tech Admissions Office (1300 W. Park St.) before December 15th (for Spring entry) and July 15th (for Fall entry). If an applicant feels he or she will not meet the criteria for acceptance into the Pre-Apprentice Line Program, he or she should notify the Admissions Office immediately so his or her slot can be opened for another applicant.

Applicants from western states should contact the Director of Financial Aid for details about the WUE tuition rate and how to apply. Certain western states participate in this reciprocity agreement that can reduce the cost of out-of-state tuition. **Students must show proof of health insurance or purchase the college's insurance before classes begin.** Individuals who wish to live in the residence halls at Montana Tech are invited to do so, although Highlands College students are not required to live on campus.

All individuals who apply to Montana Tech should also complete the following:

- FAFSA (Free Application for Federal Student Aid) to determine eligibility for federal financial aid. The FAFSA can be found online at www.fafsa.gov.

Commercial Driver's License (A) Training Permit

Students will no longer be required to have their CDL-A permit as part of the admissions requirements; however, **students who can obtain the written permit in the State of Montana in advance of attending are encouraged to do so. If not, you will only have Friday's to do so and only one month to complete.**

Students in the training will need to supply their work clothes and boots. Hard hat, safety glasses, tools, belts, and certification costs will be covered in the cost of the program. Instructional texts and specialized safety equipment (leather work-gloves and boots) must be purchased separately from the Tech bookstore at an approximate cost of $200. Upon final selection of participants, determined by completion of the items listed on the previous page, students will be ***required*** to e-mail lineprogram@mtech.edu to discuss the appropriate footwear.

Students will also have the opportunity to earn the following certifications:

- Commercial Driver's License (Class A)
- Flagger Training
- First Aid/CPR/AED
- Rigging Cert
- OSHA 10-hour ET&D

Outcomes

1. At graduation, students earning a Certificate in the Pre-Apprentice Line Program will have the necessary knowledge and skills to obtain placement within the discipline.
2. Students within the Pre-Apprentice Line Program will demonstrate competency in the use of tools, technology and safety equipment typically used in industry.
3. Demonstrate problem solving, informational literacy, technological and communication skills in team and individual learning exercises.
4. Provide students with the skills that will promote occupational growth and life-long learning.

Assessment

- Student evaluations
- Student portfolios
- Noel-Levitz Student Satisfaction Survey
- Graduate Placement Survey
- Survey of students
- Alumni

- Advisory Board

This one semester program includes the following courses

Course Name	Credits	Term Taken	Grade	Gen Ed
LINE 100 - Introduction To The Utility Industry	*2 credits*			
LINE 110 - Math for the Utility Industry	*6 credits*			
LINE 120 - Electrical For The Utility Ind	*3 credits*			
LINE 130 - Safety And Certifications	*3 credits*			
LINE 140 - Pole Yard	*16 credits*			

Total: 30

Because of the unusual credit requirments for this one-semester program, students will attend classes 40 hours per week. Individuals should be prepared to attend and participate in courses just as they would a full-time job. Because of the uniqueness of the program, program requirements and costs are approximated and subject to change.

For additional information, please contact Niki (Nicole) Flansburg at lineman@mtech.edu or (406) 496-3725. To contact the Enrollment Service Office, call (406) 496-4256.

Notes:

LINE 100-01 Introduction to the Utility Industry
Fall Semester 2024
Days:
Time:
CRN:

Instructor(s): Brandon Cassidy
John Harvey
James Pearston

Course Description – 4 credits

This course provides students with knowledge of basic and emerging principles that impact the energy industry including how the industry is organized and operates as a whole. The course will cover electric energy power generation, transmission and distribution. Students will be introduced to career opportunities in the industry including job entry requirements and educational pathways.

Course Outcomes

Upon completion of this course students will be able to:

- Explain the basic components of electrical generation, transmission, substations, and distribution powerlines.
- Identify and correctly utilize the basic tools and equipment commonly found in the line trade.
- Safely operate and maintain forestry equipment such as chain saws, pole saws, and hand saws as well as describe the rules and procedures for operating equipment on the ground and aloft.
- Demonstrate an understanding of delta, grounded wye, and undergrounded wye circuitry.
- Demonstrate proficiency in Equipotential Zone Grounding (EPZ) setups and the ability to explain the importance and implementation of personal protective grounding.
- Explain the importance of tailboards, what is required and demonstrate how to conduct one.

Required Materials:

Text Provided: Shoemaker, T., & Mack, J. (2017). *The Lineman's and Cableman's Handbook* (13th ed.). New York: McGraw-Hill Education.

Course Organization

The course consists of:

- 6 modules with lectures and reading assignments
- 6 module exams
- Final exam

Course Policies and Procedures

Academic Honor Code and Academic Honesty

Violations of the code of academic integrity will not be tolerated. Everything assigned in this course (unless otherwise directed by the professor) is to be done individually. Any indication of copied work could result in a failure of the course. Anyone who violates the academic integrity code will be disciplined according to the policies set forth by Montana Tech 2023-2024 Course Catalog. Students are expected to uphold the school's standard of conduct relating to academic honesty. Students assume full responsibility for the content and integrity of the academic work they submit. *The guiding principle of academic integrity shall be that a student's submitted work must be that of the student's own work. Students shall be guilty of violating the honor code if they:*

- *Represent the work of others as their own*
- *Use or obtain unauthorized assistance in any academic work*
- *Give unauthorized assistance to other students*
- *Misrepresent the content of submitted work*

The student has full responsibility for the content and integrity of all academic work submitted. Ignorance of a rule does not constitute a basis for waiving the rule or the consequences of that rule. Students unclear about a specific situation should ask their instructors or academic staff, who will explain what is and is not acceptable in their classes or on campus. For full access to the Academic Dishonesty policy please refer to the Montana Tech 2023-2024 Catalog:

https://catalog.mtech.edu/content.php?catoid=15&navoid=1553#ACADEMIC_DISHONESTY

Student Responsibilities and Expectations

Cell Phones & Other Electronic Devices

Students with Disabilities

Students with disabilities who believe they may need accommodations in this class are encouraged to contact the Disabilities Services Office at (406) 496-3730 or online https://www.mtech.edu/academics/services/disability/index.html at the earliest possible date.

Assignments and Assessments

There will be a total of six (6 exams) and a comprehensive final exam. Exams will be graded and averaged for the final grade for the course. In order to pass, students must have a minimum of 80% for a final grade per industry requirements.

Grade Scale

A	94-100%
B	93.99-90%
B-	89.99-87%
C	86.99-83%

C-	82.99-80%
D+	79.99-77.5%
D	77.49-76%
F	**75.99-75%** **Please Note: Below 80% does not meet Industry Required Standards for Passing; therefore, you will not pass the class with a grade below 80%.**

Important Dates

Date	Deadline
August 21, 2023	First Day of Classes
August 23, 2023	Students without completed fee payment or signed payment contract by 4:00pm will be dropped from classes
September 4, 2023	Labor Day – No Classes
September 11, 2023	Last day to drop classes
November 10, 2023	Veterans Day – No Classes
November 22 – 24, 2023	Thanksgiving Break – No Classes
December 4-8, 2023	Final Exams
December 9, 2023	Graduation

LINE 140-01 Pole Yard
Fall Semester 2024
Days:
Time:
CRN:

Instructor(s): Brandon Cassidy
John Harvey
James Pearston

Course Description – 17 credits

Hands-on experience in the use of and/or assembly of materials, tools, and equipment common to the electric utility industry. Students will gain climbing instruction and perform task such as pole top rescue, bucket truck operation, setting poles and others typically required of line apprentices.

Course Outcomes

Upon completion of this course students will be required to:

- Demonstrate the ability to safely climb wood poles using proper form and techniques.
- Demonstrate the ability to work at various heights up to 70 feet above ground grade.
- Operate and maintain trenching and backhoe equipment and perform loading and unloading of equipment for transport.
- Operate truck mounted winches and capstan.
- Operate and set-up digger derricks.
- Successfully and safely perform within industry established time parameters the following tasks: pole top rescue, single cross arm install, suspension insulator change out, and install an Equal Potential Zone (EPZ) Ground set up.
- Demonstrate proficiency in tying various knots utilized in the line trade.

Required Materials:

- Appropriate Boots (adequate heel and appropriate sole)
- Leather gloves
- Long-sleeve shirt and pants
- Safety glasses, hard hat, climbing bag and tools will be provided as part of the course

Course Organization

Students will be in the pole yard at various times Monday-Thursday. Thursday will be skills/task demonstration and assessment days.

Course Policies and Procedures

Academic Honor Code and Academic Honesty

Violations of the code of academic integrity will not be tolerated. Everything assigned in this course (unless otherwise directed by the professor) is to be done individually. Any indication of copied work could result in a failure of the course. Anyone who violates the academic integrity code will be disciplined according to the policies set forth by Montana Tech 2023-2024 Course Catalog. Students are expected to uphold the school's standard of conduct relating to academic honesty. Students assume full responsibility for the content and integrity of the academic work they submit. *The guiding principle of academic integrity shall be that a student's submitted work must be that of the student's own work. Students shall be guilty of violating the honor code if they:*

- *Represent the work of others as their own*
- *Use or obtain unauthorized assistance in any academic work*
- *Give unauthorized assistance to other students*
- *Misrepresent the content of submitted work*

The student has full responsibility for the content and integrity of all academic work submitted. Ignorance of a rule does not constitute a basis for waiving the rule or the consequences of that rule. Students unclear about a specific situation should ask their instructors or academic staff, who will explain what is and is not acceptable in their classes or on campus. For full access to the Academic Dishonesty policy please refer to the Montana Tech 2023-2024 Catalog:

https://catalog.mtech.edu/content.php?catoid=15&navoid=1553#ACADEMIC_DISHONESTY

Students with Disabilities

Students with disabilities who believe they may need accommodations in this class are encouraged to contact the Disabilities Services Office at (406) 496-3730 or online https://www.mtech.edu/academics/services/disability/index.html at the earliest possible date.

Assessments

Knot Tying Exam – students will need to be able to correctly demonstrate 10 instructor selected knots (4 points possible)

Timed Skills/Tasks

- Pole top rescue – students must be able to correctly perform in under 3:00 minutes (4 points possible)
- Single cross arm install – students must be able to correctly perform in under 9 minutes (4 points possible)
- Suspension insulator change out – students must be able to correctly perform in under 8 minutes (4 points possible)
- EPZ Ground set up – students must be able to correctly perform in under 15 minutes (4 points possible)

Grade Scale

Total Points	Grade
20 – 16	A
15.9-11	B
10.9-8.6	C
8.5	C-
A POINT TOTAL BELOW 8.5 REFLECTS TIMES AND ASSESSMENT RESULTS BELOW INDUSTRY STANDARD AND IS CONSIDERED A FAILING GRADE.	

Assessment Dates

Skills assessments in the pole yard will occur on Thursdays. Students will have multiple opportunities to practice and improve the skills/task times. THE LOWEST SKILLS/TASK TIMES THROUGHOUT THE SEMESTER WILL BE USED AS THE FINAL GRADE POINT TOTAL.

Important Dates

Date	Deadline
August 21, 2023	First Day of Classes
August 23, 2023	Students without completed fee payment or signed payment contract by 4:00pm will be dropped from classes
September 4, 2023	Labor Day – No Classes
September 11, 2023	Last day to drop classes
November 10, 2023	Veterans Day – No Classes
November 22 – 24, 2023	Thanksgiving Break – No Classes
December 4-8, 2023	Final Exams
December 9, 2023	Graduation

Skill Descriptions

Pole Top Rescue

- Climber will begin with tools off. Time will begin as climber assesses the situation, delegate the calling of 911 and for someone to retrieve the AED. Climber will don their tools and ascend pole to rescue the practice dummy. Handline will already be secured to crossarm. Climber will call for either the hook or the snap, untie the handline, drop the block (in the hole) throw their rope over the crossarm, tie three half hitches around the dummy's chest, and provide a friction wrap on the outside of the crossarm against the arm pin insulator. Climber will then retain tension, cur the dummy's skid, put away their knife, and lower the practice dummy in a controlled fashion.
- Climber will be graded by time and by knot quality and placement. The knot must be on the practice dummy's chest with rope underneath the armpits, the three half hitches must not exceed a closed fist between the knot and the practice dummy's chest while under tension. An infraction will result in a 15 second addition to the climber's total time. All infractions are accumulative.
- **DROPPING THE PRACTICE DUMMY IS AN AUTOMATIC FAIL.**

- Climber must climb in a controlled manner. If two feet gaff out of the pole the climber will have 15 seconds added to the climber's original time.

Climber will be graded as follows:

1:30 and under	A
1:31-2:15	B
2:16-2:55	C
2:56-3:00	C-
Over 3 minutes is a fail per industry standards	

Cross Arm Install

- Student will begin with their tools on at the base of the pole, handline must be together and on their belt.
- Time starts and student will climb to the top of the pole, secure their handline, and call for the cross arm.
- Crossarm will be rigged with a clove hitch on the bottom, and a picking string knot on the top.
- After cross arm is installed, handline will be milked down to groundman and the time stops when the handline is put back together (DO NOT RUN HANDLINE).
- Student will be graded on if the arm is installed correctly, all hardware is square and tight. Student shall have 15 seconds added to their time per loose hardware and/or unsquared hardware found. Also, each item or tool that climber accidentally drops will add 15 seconds to total time.
- **DROPPING OF THE ARM IS AN AUTOMATIC FAIL.**
- Student must climb in a controlled manner. If two feet gaff out of the pole climber will have 15 seconds added to their time.
- All infractions are accumulative adding to a combined total of time in addition to climber's original time.

Climber will be graded as follows:

6:00 and under	A
6:10-7:00	B
7:01-8:00	C
8:01-9:00	C-
Over 9 minutes is a fail per industry standards	

Suspension Insulator Replacement

- Student will begin with tools on at the base of the pole, handline must be together and on their belt. Time starts and student will climb to the top of the pole, secure their handline, and tie a clove hitch to insulator.
- Student will unpin insulator, insulator will be lowered to ground, untied by groundman, retied by groundman and sent back up the handline. Climber will re-pin insulator, untie clove hitch, milk handline to the ground, handline MUST be put back together. Climber will run handline and the time stops when the handline hits the ground.
- Any tool or equipment that falls will add 15 seconds to climber's completed time. Dropped items will accumulate to the climber's final time.
- **IF THE INSULATOR IS DROPPED IT IS AN AUTOMATIC FAIL.**
- If a climber breaks a bell, it is a 15 second addition to completion time.

- Students must climb in a controlled manner. If two feet gaff out of the pole the climber will have 15 seconds added to time.
- All infractions are accumulative adding to a combined total time in addition to climber's original time.

Climber will be graded as follows:

4:00 and under	A
4:01-5:00	B
5:01-6:30	C
6:31-8:00	C-
Over 8 minutes is a fail per industry standards	

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.

Final changes are made by the registrar after faculty senate approval and BOR approval, as needed.
See workflow document
https://helpx.adobe.com/acrobat/how-to/convert-word-excel-paper-pdf-forms.html?set=acrobat--fundamentals--pdf-forms
Guidance can be found at: https://mus.edu/che/arsa/academicproposals.html

Submission Requirements: All Submissions (checked by CRC):

- ☐ Electronic Copy (with the exception of signatures- no handwritten items)
- ☐ Completed CRC Form, with all Signatures and Attachments based on level of request (see below)
- ☐ Naming Convention as determined by CRC

LEVEL of Request

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

1. *Faculty Approvals (directly to CRC, then Faculty Senate):*
   - ☐ Establish a new course for the catalog (please contact the Registrar of MUS CCN information) Required Documents:
     - ☐ Course Number
     - ☐ Course Outcomes
     - ☐ Course Description
     - ☐ Syllabus
     - ☐ Curriculum Worksheet
     - ☐ Pre-requisite or co-requisite
   - ☐ Course Changes: addition, deletion or change of title, credit, course number, pre-req, description, or cross listing. Required Documents:
     - ☐ Course Number
     - ☐ Course Outcomes
     - ☐ Course Description
     - ☐ Syllabus
     - ☐ Pre-requisites or co-requisites
     - ☐ Existing Curriculum Worksheet
     - ☐ New Curriculum Worksheet, with changes highlighted
   - ☐ 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. Required Documents:
     - ☐ **Documents as listed under establishing a new course (as applicable)**
     - ☐ Existing Curriculum Worksheet
     - ☐ New Curriculum Worksheet, with changes highlighted

   X Other (for those that are considered in this level but otherwise not listed): OCHE Directed Accelerated Automotive Technology AAS Cohort

2. *Campus Approvals Level I (must be approved by the VCAA prior to CRC submission):*
   Placing a postsecondary educational program into moratorium: Required Documents:
   Program Termination and Moratorium Form
   Academic Proposal Request Form
   - ☐ Withdrawing a postsecondary educational program from moratorium. Required Documents:
     - ☐ Academic Proposal Request Form

- ☐ Establishing, re-titling, terminating or revising a campus certificate of 29 credits or more. Required Documents:
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Establishing a B.A.S./A.A./A.S. area of study. Required Documents:
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Offering an existing postsecondary educational program via distance or online delivery. Required Documents:
  - ☐ Academic Proposal Request Form
- ☐ Other (for those that are considered in this level but otherwise not listed):

  _____
  - ☐ Academic Proposal Request Form

3. OCHE Approvals Level I *(must be approved by the VCAA and Chancellor prior to CRC submission)*: Level I items are those requests for which the Board of Regents has fully designated approval authority to the institution or Commissioner of Higher Education. These requests are to be submitted for notification to or approval by Commissioner as Level I proposals. Level I proposals may be submitted to OCHE at any time by the flagship campuses or community colleges and will be processed on a rolling monthly schedule. The approval of such proposals will be conveyed to the Board of Regents at the next meeting of the board. Level I proposals include campus initiatives typically characterized by minimal costs, clear adherence to approved campus mission, and the absence of significant programmatic impact on other institutions within the MUS and community colleges. BOR Forms can be found using the following link: https://mus.edu/che/arsa/Forms/AcademicForms.html

- ☐ Re-titling an existing postsecondary educational program. Required Documents:
  - ☐ Academic Proposal Request Form
- ☐ Terminating an existing postsecondary educational program.
  - ☐ Academic Proposal Request Form
  - ☐ Program Termination and Moratorium Form
- ☐ Consolidating existing postsecondary educational programs
  - ☐ Academic Proposal Request Form
  - ☐ Curriculum Proposal Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Establishing a new minor where there is a major or an option in a major
  - ☐ Academic Proposal Request Form
  - ☐ Curriculum Proposal Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Revising a postsecondary educational program
  - ☐ Curriculum Proposal Form
  - ☐ Academic Proposal Request Form
- ☐ Establishing a temporary C.A.S. or A.A.S. degree program Approval limited to 2 years
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**

- ☐ Other (for those that are considered in this level but otherwise not listed):

  _____
- ☐ Academic Proposal Request Form

4. Level II *(must be approved by the VCAA and Chancellor prior to CRC submission)*:
Level II proposals require initial approval and comment by the Board of Regents through a Request to Plan prior to final review and approval by the Office of the Commissioner of Higher Education. These proposals entail more substantive additions to, alterations in, or termination of programs, structures, or administrative or academic entities typically characterized by the (a) addition, reassignment, or elimination or personnel, facilities, or courses of instruction; (b) rearrangement of budgets, cost centers, funding sources; and (c) changes which by implication could impact other MUS institutions and community colleges.

- ☐ Establishing a new postsecondary educational program
  - ☐ Academic Proposal Request Form
  - ☐ Curriculum Proposal
  - ☐ Completed Intent to Plan Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Permanent authorization for a temporary C.A.S. or A.A.S degree program
  - ☐ Academic Proposal Request Form
  - ☐ Curriculum Proposal
  - ☐ Completed Intent to Plan Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Exceeding the 120 credit maximum for baccalaureate degrees Exception to policy 301.11
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Forming, eliminating or consolidating an academic, administrative, or research unit
  - ☐ Academic Proposal Request Form
  - ☐ Curriculum or Center/Institute Proposal
  - ☐ Completed Request to Plan, except when eliminating or consolidating
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Re-titling an academic, administrative, or research unit Permanent authorization for a temporary C.A.S. or A.A.S degree program
- ☐ Curriculum Proposal
- ☐ Completed Intent to Plan Form

Date 2/13/24
Dept. Trades & Technology **College** Highlands College
Program: Automotive Technology

CRC Representative Linda Granger

Description of Request: Development of an OCHE directed Accelerated Automotive Technology "Sprint" AAS cohort that students who begin taking courses through high school dual enrollment can complete in one calendar year once enrolled full-time at Tech in the Automotive Tech program post high school graduation. The cohort is required due to the need to realign the course sequencing in the traditional Automotive Technology AAS.

Current Course or Program Information: The current Automotive Technology AAS is designed to be completed in four semesters (fall, spring) over two years.

Number (Assigned By CRC): _____
Proposed Change

Course # Name Credits Pre-req.

Automotive Technology – SPRINT – AAS
Curriculum Sheet
Effective Fall 24-25

Course Number	Title	Credits	Semester Completed
	High School Dual Enrollment		
CAPP 131 **OR**	Basic MS Office	3	
CAPP 156	MS Excel		
WRIT 100 **OR**	Composing Mindfully: Writing Fundamentals **OR**	3	
WRIT 101 **OR**	College Writing I **OR**		
WRIT 121	Introduction to Technical Writing		
M 111 **OR**	Technical Mathematics **OR**	3	
M 105 **OR**	Contemporary Mathematics **OR**		
M 121	College Algebra		
BGEN 105	Introduction to Business	3	
COMX 115 **OR**	Interpersonal Communication **OR**	3	
BGEN 235	Business Law		
AST 102	Introduction to Automotive Service	3	
Total Credits		**18**	

SUMMER WORK-BASED LEARNING EXPERIENCE

	FALL SEMESTER – ON CAMPUS		
AST 118	Brakes & Chassis Lecture	3	
AST 119	Brakes & Chassis Lab	3	
AST 136	Automotive Electrical/Electronics Lecture	3	
AST 137	Automotive Electrical/Electronics Lab	3	
AST 172	Automotive Air Conditioning	3	
Total Credits		**15**	
	SPRING SEMESTER		
AST 160	Automotive Engine Repair Lecture	3	
AST 161	Automotive Engine Repair Lab	3	
AST 166	Engine Performance & Diagnostics Lecture	3	
AST 167	Engine Performance & Diagnostics Lab	3	
Total Credits		**12**	
	SUMMER SESSION		
AST 270	Automatic Transmission & Transaxles Lecture	3	
AST 271	Automatic Transmission & Transaxles Lab	3	
AST 230	Electrical/Electronic System II	4	
DST 260	Diesel Engine Diagnostic Troubleshooting	3	
DST 265	Applied Lab Experience	3	
AST 298 **OR**	Automotive Internship **OR**	1-6 (variable)	
AST 299	Automotive Capstone		
Total Credits		**17**	
	TOTAL CREDITS FOR FOUR SEMESTERS	**62**	

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

List of supporting documentation attached (See Level of Request for Requirements):

Accelerated Automotive Technology "Sprint" AAS Curriculum Sheet
Current Automotive Technology AAS Curriculum sheet from 23-24 catalog
Automotive Technology AAS Curriculum Sheet fall 24-25

Assessment Leading to Request

The Accelerated Automotive Technology "Sprint" AAS development began as part of an OCHE driven and funded initiative to provide accelerated program offerings across the state of Montana. Highlands College focused on the Automotive Technology AAS after conversations with automotive industry partners expressing frustration with the lack of skilled employees available and opportunities for industry collaboration were identified to increase the number of skilled automotive technicians in the community.

Anticipated Impacts to "Other" Programs
The cohort will take the Automotive Technology courses on campus at the same time as the students in the traditional program, however, they will be sequenced differently and will finish in summer rather than spring semester. To accommodate the additional students in the lab, an adjunct will be hired out of the OCHE funding to assist in lab instruction and oversight.

Impact on Library: None

Date to take effect: Fall 2024

APPROVALS

Department Chair Approval Jim LeProwse
Date 3-12-2024

Dean Approval Karen Van Dover
Date 3-12-2024

Graduate Council Approval
Date _____

CRC Approval
Date _____

Faculty Senate Approval
Date _____

VCAA Approval (see below)
Date _____

Chancellor Approval (see below)
Date _____

Automotive Technology – SPRINT – AAS
Curriculum Sheet
Effective Fall 24-25

Students planning on completing **ONLY** the Certificate of Applied Science or the Associate of Applied Science in Automotive Technology will complete the Elective courses in **GREEN**.

Students planning on continuing beyond the Associate of Applied Science and completing the Bachelor of Applied Science in Business **MUST** complete the Elective courses in **ORANGE**.

Course Number	Title	Credits	Semester Completed
	High School Dual Enrollment		
CAPP 131 **OR**	Basic MS Office	3	
CAPP 156	MS Excel		
WRIT 100 **OR**	Composing Mindfully: Writing Fundamentals **OR**	3	
WRIT 101 **OR**	College Writing I **OR**		
WRIT 121	Introduction to Technical Writing		
M 111 **OR**	Technical Mathematics **OR**	3	
M 105 **OR**	Contemporary Mathematics **OR**		
M 121	College Algebra		
BGEN 105	Introduction to Business	3	
COMX 115 **OR**	Interpersonal Communication **OR**	3	
BGEN 235	Business Law		
AST 102	Introduction to Automotive Service	3	
Total Credits		**18**	
	SUMMER WORK-BASED LEARNING EXPERIENCE		
	FALL SEMESTER – ON CAMPUS		
AST 118	Brakes & Chassis Lecture	3	
AST 119	Brakes & Chassis Lab	3	
AST 136	Automotive Electrical/Electronics Lecture	3	
AST 137	Automotive Electrical/Electronics Lab	3	
AST 172	Automotive Air Conditioning	3	
Total Credits		**15**	
	SPRING SEMESTER		
AST 160	Automotive Engine Repair Lecture	3	
AST 161	Automotive Engine Repair Lab	3	
AST 166	Engine Performance & Diagnostics Lecture	3	
AST 167	Engine Performance & Diagnostics Lab	3	
Total Credits		**12**	

	SUMMER SESSION	
AST 270	Automatic Transmission & Transaxles Lecture	3
AST 271	Automatic Transmission & Transaxles Lab	3
AST 230	Electrical/Electronic System II	4
DST 260	Diesel Engine Diagnostic Troubleshooting	3
DST 265	Applied Lab Experience	3
AST 298 **OR**	Automotive Internship **OR**	1-6 (variable)
AST 299	Automotive Capstone	
Total Credits		**17**
	TOTAL CREDITS FOR FOUR SEMESTERS	**62**

*ACTG 201 Principles of Financial Accounting is recommended for students who plan on pursuing a BAS degree and will need to be completed prior to AAS completion.

Automotive Technology AAS
Curriculum Sheet
Effective Fall 24-25

Students planning on completing ONLY the Certificate of Applied Science or the Associate of Applied Science in Automotive Technology will complete the Elective courses in GREEN.
Students planning on continuing beyond the Associate of Applied Science and completing the Bachelor of Applied Science in Business MUST complete the Elective courses in ORANGE.

Course Number	Title	Credits	Semester Completed
	FIRST SEMESTER		
AST 102	Introduction to Automotive Service	3	
AST 118	Brakes & Chassis	3	
AST 119	Brakes & Chassis Lab	3	
AST 160	Automotive Engine Repair (Lecture)	3	
AST 161	Automotive Engine Repair (Lab)	3	
M 111 OR	Technical Mathematics (recommended for students who plan on only completing the CAS or AAS)	3	
M 105 OR	Contemporary Mathematics (recommended for students who plan on pursuing a BAS degree)		
M 121	College Algebra (recommended for students who plan on pursuing a BAS degree)		
Total Credits		**18**	
	SECOND SEMESTER		
AST 136	Automotive Electrical/Electronics Systems	3	
AST 137	Automotive Electrical/Electronics Systems Lab	3	
AST 166	Engine Performance & Diagnostics	3	
AST 167	Engine Performance & Diagnostics Lab	3	
WRIT 100 OR	Composing Mindfully: Writing Fundamentals (recommended section specifically for Trades Programs students who plan on only completing the CAS or AAS)	3	
WRIT 101 OR	College Writing I (recommended for students who plan on pursuing a BAS degree)		
Writ 121	Introduction to Technical Writing (recommended for students who plan on pursuing a BAS degree)		
Total Credits		**15**	
	EXIT POINT FOR CERTIFICATE OF APPLIED SCIENCE AUTOMOTIVE TECHNOLOGY		
	THIRD SEMESTER		
DST 260	Diesel Engine Diagnostic Troubleshooting	3	
DST 265	Applied Lab Experience	3	
AST 270	Automatic Transmissions and Transaxles	3	
AST 271	Automatic Transmissions and Transaxles Lab	3	

CAPP 131 OR	Basic MS Office	3
CAPP 156	MS Excel	
Total Credits		**15**
	FOURTH SEMESTER	
AST 298 OR AST 299	Automotive Internship OR Automotive Capstone	1-6 credits (Variable)
AST 230	Electrical/Electronics Systems II (Lecture/Lab)	4
AST 172	Automotive Air Conditioning (Lecture/Lab)	3
COMX 115 OR	Introduction to Interpersonal Communication (recommended for students who plan on only completing the AAS)	3
BGEN 235	Business Law (recommended for students who plan on pursuing a BAS degree)	3
BGEN 105	Introduction to Business	3
Total Credits		**14**
	TOTAL MINIMUM CREDITS FOR FOUR SEMESTERS	**62**

Automotive Technology AAS
Curriculum Sheet
Effective Fall 23-24

Students planning on completing **ONLY** the Certificate of Applied Science or the Associate of Applied Science in Automotive Technology will complete the Elective courses in **GREEN.**

Students planning on continuing beyond the Associate of Applied Science and completing the Bachelor of Applied Science in Business **MUST** complete the Elective courses in **ORANGE.**

Course Number	Title	Credits	Semester Completed
	FIRST SEMESTER		
AST 102	Introduction to Automotive Service	3	
AST 118	Brakes & Chassis	3	
AST 119	Brakes & Chassis Lab	3	
AST 136	Automotive Electrical Systems (Lecture)	3	
AST 137	Automotive Electrical Systems (Lab)	3	
M 111 **OR**	Technical Mathematics (recommended for students who plan on only completing the CAS or AAS)	3	
M 105 **OR**	Contemporary Mathematics (recommended for students who plan on pursuing a BAS degree)		
M 121	College Algebra (recommended for students who plan on pursuing a BAS degree)		
Total Credits		**18**	
	SECOND SEMESTER		
AST 160	Automotive Engine Repair (Lecture)	3	
AST 161	Automotive Engine Repair (Lab)	3	
AST 166	Engine Performance & Diagnostics	3	
AST 167	Engine Performance & Diagnostics Lab	3	
WRIT 100 **OR**	Composing Mindfully: Writing Fundamentals (recommended section specifically for Trades Programs students who plan on only completing the CAS or AAS)	3	
WRIT 101 **OR**	College Writing I (recommended for students who plan on pursuing a BAS degree)		
Writ 121	Introduction to Technical Writing (recommended for students who plan on pursuing a BAS degree)		
Total Credits		**15**	

EXIT POINT FOR CERTIFICATE OF APPLIED SCIENCE AUTOMOTIVE TECHNOLOGY

	THIRD SEMESTER		
DST 260	Diesel Engine Diagnostic Troubleshooting	3	
DST 265	Applied Lab Experience	3	
AST 172	Automotive Air Conditioning (Lecture/Lab)	3	
CAPP 131 **OR**	Basic MS Office	3	
CAPP 156	MS Excel		
Total Credits		**12**	

	FOURTH SEMESTER	
AST 298 OR AST 299	Automotive Internship OR Automotive Capstone	1-6 credits (Variable)
AST 230	Electrical/Electronics Systems II (Lecture/Lab)	4
AST 270	Automatic Transmissions & Transaxles Lecture	3
AST 271	Automatic Transmissions & Transaxles Lab	3
COMX 115 **OR**	Introduction to Interpersonal Communication (recommended for students who plan on only completing the AAS)	3
BGEN 235	Business Law (recommended for students who plan on pursuing a BAS degree)	
BGEN 105	Introduction to Business	3
Total Credits		**17**
	TOTAL CREDITS FOR FOUR SEMESTERS	**62**

*ACTG 201 Principles of Financial Accounting is recommended for students who plan on pursuing a BAS degree and will need to be completed prior to AAS completion.

MontanaTech *Curriculum Change Request Form Dated December 23, 2022*

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.

Final changes are made by the registrar after faculty senate approval and BOR approval, as needed.
See workflow document
https://helpx.adobe.com/acrobat/how-to/convert-word-excel-paper-pdf-forms.html?set=acrobat--fundamentals--pdf-forms
Guidance can be found at: https://mus.edu/che/arsa/academicproposals.html

Submission Requirements: All Submissions (checked by CRC):

- ☐ Electronic Copy (with the exception of signatures- no handwritten items)
- ☐ Completed CRC Form, with all Signatures and Attachments based on level of request (see below)
- ☐ Naming Convention as determined by CRC

LEVEL of Request

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

1. *Faculty Approvals (directly to CRC, then Faculty Senate):*
   - ☐ Establish a new course for the catalog (please contact the Registrar of MUS CCN information) Required Documents:
     - ☐ Course Number
     - ☐ Course Outcomes
     - ☐ Course Description
     - ☐ Syllabus
     - ☐ Curriculum Worksheet
     - ☐ Pre-requisite or co-requisite
   - ■ Course Changes: addition, deletion or change of title, credit, course number, pre-req, description, or cross listing. Required Documents:
     - ☐ Course Number
     - ☐ Course Outcomes
     - ■ Course Description
     - ☐ Syllabus
     - ☐ Pre-requisites or co-requisites
     - ☐ Existing Curriculum Worksheet
     - ☐ New Curriculum Worksheet, with changes highlighted
   - ☐ 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. Required Documents:
     - ☐ **Documents as listed under establishing a new course (as applicable)**
     - ☐ Existing Curriculum Worksheet
     - ☐ New Curriculum Worksheet, with changes highlighted
   - ☐ Other (for those that are considered in this level but otherwise not listed):

     _____

2. *Campus Approvals Level I (must be approved by the VCAA prior to CRC submission):*
   - ☐ Placing a postsecondary educational program into moratorium: Required Documents:
     - ☐ Program Termination and Moratorium Form
     - ☐ Academic Proposal Request Form
   - ☐ Withdrawing a postsecondary educational program from moratorium. Required Documents:
     - ☐ Academic Proposal Request Form

- ☐ Establishing, re-titling, terminating or revising a campus certificate of 29 credits or fewer. Required Documents:
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Establishing a B.A.S./A.A./A.S. area of study. Required Documents:
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Offering an existing postsecondary educational program via distance or online delivery. Required Documents:
  - ☐ Academic Proposal Request Form

3. OCHE Approvals Level I *(must be approved by the VCAA and Chancellor prior to CRC submission)*:
Level I items are those requests for which the Board of Regents has fully designated approval authority to the institution or Commissioner of Higher Education. These requests are to be submitted for notification to or approval by Commissioner as Level I proposals. Level I proposals may be submitted to OCHE at any time by the flagship campuses or community colleges and will be processed on a rolling monthly schedule. The approval of such proposals will be conveyed to the Board of Regents at the next meeting of the board. Level I proposals include campus initiatives typically characterized by minimal costs, clear adherence to approved campus mission, and the absence of significant programmatic impact on other institutions within the MUS and community colleges. BOR Forms can be found using the following link:
https://mus.edu/che/arsa/Forms/AcademicForms.html

- ☐ Re-titling an existing postsecondary educational program. Required Documents:
  - ☐ Academic Proposal Request Form
- ☐ Terminating an existing postsecondary educational program.
  - ☐ Academic Proposal Request Form
  - ☐ Program Termination and Moratorium Form
- ☐ Consolidating existing postsecondary educational programs
  - ☐ Academic Proposal Request Form
  - ☐ Curriculum Proposal Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Establishing a new minor where there is a major or an option in a major
  - ☐ Academic Proposal Request Form
  - ☐ Curriculum Proposal Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Revising a postsecondary educational program
  - ☐ Curriculum Proposal Form
  - ☐ Academic Proposal Request Form
- ☐ Establishing a temporary C.A.S. or A.A.S. degree program Approval limited to 2 years
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**

4. Level II *(must be approved by the VCAA and Chancellor prior to CRC submission)*:
Level II proposals require initial approval and comment by the Board of Regents through a Request to Plan prior to final review and approval by the Office of the Commissioner of Higher Education. These proposals entail more substantive additions to, alterations in, or termination of programs, structures, or administrative or academic entities typically characterized by the (a) addition, reassignment, or elimination or personnel, facilities, or courses of instruction; (b) rearrangement of budgets, cost centers, funding sources; and (c) changes which by implication could impact other MUS institutions and community colleges.

- ☐ Establishing a new postsecondary educational program

- ☐ Request to Plan (RTP)
- ☐ Academic Proposal Request Form
- ☐ Curriculum Proposal
- ☐ Fiscal Analysis Form
- ☐ Completed Intent to Plan Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Permanent authorization for a temporary C.A.S. or A.A.S degree program

- ☐ Academic Proposal Request Form
- ☐ C.A.S/A.A.S Curriculum Proposal
- ☐ Fiscal Analysis Form
- ☐ Completed Intent to Plan Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Exceeding the 120 credit maximum for baccalaureate degrees Exception to policy 301.11

- ☐ Academic Proposal Request Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Forming, eliminating or consolidating an academic, administrative, or research unit

- ☐ Academic Proposal Request Form
- ☐ Curriculum or Center/Institute Proposal
- ☐ Completed Request to Plan, except when eliminating or consolidating
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Re-titling an academic, administrative, or research unit Permanent authorization for a temporary C.A.S. or A.A.S degree program

☐ Curriculum Proposal

☐ Completed Intent to Plan Form

MontanaTech *Curriculum Change Request Form Dated December 23, 2022*

Date 3/25/2024
Dept. Biology **College** CLSPS
Program Biology **CRC Representative** Graff

Description of Request:

Update course description for BIOH 201/202. They are currently listed as combined when the lab was separated from the lecture in the past. The outdated description in the course catalog is creating issues with the new ransfer evaluation system.

Current Course or Program Information:

BIOH 201/202 - Anatomy & Physiology I 4 credits (Hrs: 3 Lec, 3 lab).

Number (Assigned By CRC):

Proposed Change

Course #	Name	Credits	Pre-req.

New Course description

BIOH 201 Anatomy & Physiology I
3 credits (hrs: 3 lec)
The first half of a two semester course designed for students pursuing a career in the clinical sciences. The course is developed as a systems approach to structure (anatomy) and function (physiology) of the human body and will present subject matter as it relates to homeostasis and disease processes. Topics include an overview of chemistry, cell biology and histology followed by structure and function of skeletal, muscular, nervous systems, ~~Satisfies upper division Writing core~~. Course generally offered 1st semester and summer

BIOH 202 Anatomy & Physiology 1 lab
1 credit (hrs 3 lab)
Companion laboratory BIOH 201. Comprehensive study of tissues and gross human anatomy necessary for students in health-related programs. Emphasis on typical structure and function as they relate to health. Topics include tissues through nervous system. Some labs involve cadavers
Course offered 1st semester and summer.

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

List of supporting documentation attached (See Level of Request for Requirements):

Assessment Leading to Request

Course description was outdated and didn't take into account that the lab and lecture have been separated into 2 courses with separate grades. It was also creating issues with the new transfer software as it was pulling them both up as 3 credits.

Anticipated Impacts to "Other" Programs

None--

Impact on Library: None has consulted with _____ 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 (note that the earliest date is the next calendar year): AY 24-25

Montana Technological University

BIOH 201: Anatomy & Physiology I
Fall 2023

Lecture: MWF 12:00-12:50pm Library Auditorium

Instructor: Katherine Mattern
Office: CBB, Rm 222
Email: kmattern@mtech.edu Phone # 406-496-4452
Office Hours: 10:00-11:30; MWT; or by appointment

Required Course Materials

Lecture Text: Human Anatomy & Physiology, 11th Ed., Marieb, Elaine N. / Hoehn, Katja

Lab Text: Human Anatomy & Physiology Laboratory Manual, 13th ed., Marieb, Elaine N., Smith, Lori A.

OR

Anatomy & Physiology INTEGRATE Custom Lab Manual Good/Johnston (reduced price in bookstore)

Engagement: In the past, iClickers have been used as a way to engage you during lecture. These are an additional cost to each student, and optional technology is being explored to avoid this. We will be doing group activities during lecture and you will be required to bring paper and writing utensils. Your group work will be collected and graded for participation.

Course Description

BIOH 201 Human Anatomy and Physiology I is the first half of a two-semester course that is held face-to-face. The course is developed as a systems approach to structure (anatomy) and function (physiology) of the human body and will present subject matter as it relates to homeostasis and disease processes. First semester topics include an overview of cell biology and histology followed by discussion of the organ systems involved in covering, support, movement, and communication of the human body.

Course Policies

- Your physical attendance in class is critical to your learning and is an expectation of enrollment. A great deal of new and complex terminology and topics will be covered during the course- so do everything you can do be present and engaged during each class. Ask questions and be involved with class discussions. If you are struggling or have questions, please come see me as soon as possible.
- Come to class on time, and with your cell phone on silent. This is a large lecture, so please be respectful of those learning around you. Any continued disruptions or disrespect may warrant corrective actions and/or removal from the class.
- I will be posting recorded lectures on MOODLE as needed and will post outlines you can use to take notes over the lecture materials we cover. You can print these outlines in advance or take notes in any manner that helps you learn. Having an effective way to organize your learning will help you feel more in control of the material we are covering.
- At no time is it appropriate to record videos of myself or others in the class. Please respect the privacy of those around you. If you wish to record a voice-only memo, please see me before doing so.
- It is your responsibility to read the accompanying chapters listed in this syllabus, as well as to do the assignments on MOODLE. More detailed information can be found in the text then we may cover in class. You can add to your notes from your time spent reading and doing assignments for a more comprehensive overview of the material.
- We will be doing interactive group work and questions in lecture, and you will be graded on these responses.
- If you choose to miss class, it is your responsibility to obtain any information (lecture notes, handouts etc.) from another student or any materials posted on MOODLE.
- Exams are scheduled on the syllabus. No make-up exams will be offered unless arrangements are made with me prior to the date of the exam.
- Any student found cheating will receive an F on the exam and will be reported to academic VC for academic dishonesty.

Disabilities

- Montana Tech provides reasonable accommodations to students who are registered with Disability Services. If you have been diagnosed with or believe you may have a disability, contact Disability Services to discuss accommodations, and access needs, and obtain an Accommodation Letter. You can reach the Disability Services Coordinator via email at sgoodell@mtech.edu by phone at 406-496-4428, or in person in the Academic Center for Excellence (ACE) within the Student Success Center (SSC). All services are confidential. Once you have received your letter, please meet with me to discuss your access needs.
- Additional support services are available in tutoring, counseling, careers, for veterans, and financial aid. Please visit https://www.mtech.edu/student-life/services/ for more information.

Student Outcomes

Students who have completed this course should be able to:

- use and understand descriptive anatomical and directional terminology.
- give examples of how structure of anatomical features relates to specific functions.
- use anatomical knowledge to predict physiological consequences, as they pertain to the organization of the human body from the atomic to the organismal level.
- identify the unique cytological and histological tissues that cover, support, and allow movement of the body.
- recognize and explain the principle of homeostasis and how feedback loops apply to physiological systems.
- identify the major gross and microscopic anatomical components of the integumentary, skeletal, muscular, and nervous systems.
- recognize the systems in place that regulate and integrate the communication between body systems.
- synthesize ideas to connect the knowledge of anatomy and physiology to real-world situations, including healthy lifestyle decisions and homeostatic imbalances.

Grading

Your grade in the lecture course will be based on the following:

Lecture Exams *	70%
Participation	15%
Assignments	15%
Total	100%

**final exam optional/ can replace lowest exam score*

Grading scale:

A = 93-100%
A- =90-92.4%
B+ = 87-89.4%
B = 84-86%
B- = 80-83%
C+ = 77-79%
C = 74-76%
C- 70-73%
D+ = 67-69%
D = 64-66%
D- = 60-63%
F < 60%

Successful Course Strategy

Anatomy & Physiology is a difficult course with a large amount of information to learn and memorize. However, it is also a highly rewarding and applicable course that can serve as a "User Guide" to your body, or as the foundational understanding for further biological applications. To do well, you must be prepared to take notes and ask questions. You will need to access MOODLE where your assignments and grades will be located, as well as check your email regularly. A very important responsibility you have is the assigned reading, which should add to your lecture notes and help clarify the content. Review your notes after each class period and set aside time to study every day. If there are things you do not understand, please ask questions in lecture, or come and see me during office hours. There are many helpful online resources that you can choose from that will help you study. Please do not save all your reviewing and questions until just before examinations – that will be too late and will reflect poorly on your test scores.

I am excited to share in this experience with you and look forward to your success!

Tentative Schedule*

LECTURE/READING/EXAM

All readings from Human Anatomy and Physiology 11th Edition by E. N. Marieb

Date	Topic	Reading
8/21	Introduction	Chapter 1
8/23-8/25	Homeostasis, Anatomical Language	Chapter 1
8/28-8/30	Types of Matter, Macromolecules, and Cells	Chapter 2,3
9/1	Movement in Cells, Cytoplasmic Organelles	Chapter 3
9/4	**Labor Day- no class**	
9/6-9/8	Cellular Biology, Intro to Tissues	Chapter 3, 4
9/11-9/13	Histology	Chapter 4
9/15	**LECTURE EXAM I**	
9/18-9/20	Integumentary System	Chapter 5
9/22-9/25	Bones and Skeletal Tissue	Chapter 6
9/27-10/4	Skeletal System	Chapter 7
10/6	**LECTURE EXAM II**	
10/9-10/13	Articulations	Chapter 8
10/16-10/25	Muscle Physiology	Chapter 9
10/27-11/1	Muscular System	Chapter 10
11/3	**LECTURE EXAM III**	
11/6-11/8	Nervous Tissue and System	Chapter 11
11/10	**Veteran's Day- no class**	
11/13-11/15	Central Nervous System	Chapter 12
11/17-11/20	Peripheral Nervous System, Reflexes	Chapter 13
11/22-11/24	**Thanksgiving Holiday- no class**	
11/27-11/29	Autonomic Nervous System	Chapter 14
12/1	**Lecture Exam IV**	
TBA	**FINAL EXAM (optional)**	**Cumulative**

** Dates for lecture exams, as well as the syllabus and class materials may be changed by the instructor. New dates and information will be announced in class and also will be posted on MOODLE.*

Montana Technological University

BIOH 202: Anatomy & Physiology I Labs
Fall 2023

Location: CBB 005

Instructor: Katherine Mattern
Office: CBB, Rm 222
Email: kmattern@mtech.edu Phone # 406-496-4452
Office Hours: 10:00-11:30; MWF; or by appointment

Dr. Deepa DeSilva
Office: CBB 204B
Email: ddesilva@mtech.edu Phone # 406-496-4227
Office Hours: 8:00-11:00; T and 10:30-1:30; R or by appointment

Holly Horner
CBB 005
Email: hhorner@mtech.edu Phone# 303-999-7641

Course Materials

Text: Human Anatomy and Physiology Laboratory Manual, 13th Ed., Marieb, Elaine N. / Smith, Lori A

OR

Anatomy & Physiology INTEGRATE Custom Lab Manual Good/Johnston (reduced price in bookstore)

Course Policies

- You will be required to successfully complete a Lab Safety Quiz PRIOR to beginning your lab course. There will be no labs the first week of school to allow you time to complete this from MOODLE. If your lab safety quiz is not completed successfully in the allotted time, you will be removed from the course.
- When entering the laboratory space, you must be properly attired with close-toed shoes and an appropriate length pant. Absolutely no food or drinks are allowed in the lab. You may leave your water bottles outside in the hallway or use the nearby drinking fountain.
- When cadavers are in use for study, absolutely no cell phones may be used for pictures or recording. A review of appropriate use and behavior of cadavers must be signed by each lab participant prior to cadaver study. Any violation of this will result in removal from the course.
- Because of the difficulty and time involved in setting up lab exams, they will only be given on one day at hourly intervals. You will sign up for a time to take the exam, as well as times to review during the week. There will be no other lab exercise on the weeks of lab practical exams.

Disabilities

- Montana Tech provides reasonable accommodations to students who are registered with Disability Services. If you have been diagnosed with or believe you may have a disability, contact Disability Services to discuss accommodations, and access needs, and obtain an Accommodation Letter. You can reach the Disability Services Coordinator via email at sgoodell@mtech.edu by phone at 406-496-4428, or in person in the Academic Center for Excellence (ACE) within the Student Success Center (SSC). All services are confidential. Once you have received your letter, please meet with me to discuss your access needs.

Grading

Your grade in the lab will be based on the following:

Lab Practicals (4)	70%
Lab Entrance Quizzes (7)	18%
Lab Exit Quizzes (8)	12%
Total	100%

Grading scale:
A = 93-100%
A- =90-92.9%
B+ = 87-89.9%
B = 84-86%
B- = 80-83%
C+ = 77-79%
C = 74-76%
C- 70-73%
D+ = 67-69%
D = 64-66%
D- = 60-63%
F < 60%

BIOH 202/302 A & P 1 Lab Exercises, Lab Quizzes and Practical Exam Schedule Fall 2023

Date	Lab	Topic	Material	Assignments
8/22-8/23	No Lab	Lab Safety Quiz	Access your materials from MOODLE	90% or higher on lab safety quiz
8/29-8/31	**Lab 1** Ex. 1, 3, 6	Language, Microscopes, Epithelial Tissues	Anatomical Terms, Microscope Parts, Epithelial Tissues & Histology	Entrance Quiz 1 = lab safety quiz Exit Quiz 1
9/5-9/7	**Lab 2** Ex. 6, 7	Connective Tissues & Integumentary System	Connective Tissue Histology and Skin Structures	Entrance Quiz 2 Exit Quiz 2
9/14	**Practical 1**	**Review**	**Open Lab Mon-Wed**	
9/19-9/21	**Lab 3** Ex.8, 9	Axial Skeleton *Cadaver Use	Skull and Vertebrae	Entrance Quiz 3 Exit Quiz 3
9/26-9/28	**Lab 4** Ex. 10	Appendicular Skeleton	Arms and Legs	Entrance Quiz 4 Exit Quiz 4
10/5	**Practical 2**	**Review**	**Open Lab Mon-Wed**	
10/10-10/12	**Lab5** Ex. 11, 13	Joints & Axial Muscles	Shoulder, Hip and Knee Joints; Facial, Neck, Chest, Abdominal and Back Muscles	Entrance Quiz 5 Exit Quiz 5
10/17-10/19	**Lab 6** Ex. 13	Appendicular Muscles	Arm, Forearm, Thigh and Leg Muscles	Entrance Quiz 6 Exit Quiz 6
10/26	**Practical 3**	**Review**	**Open Lab Mon-Wed**	
10/31-11/2	**Lab 7** Ex. 17, 19	Brain, Spinal Cord & Nerves	Brain & Spinal Cord: Regions, Structures; Nerves	Entrance Quiz 7 Exit Quiz 7
11/7-11/9	**Lab 8** Ex. 17	Sheep Brain	Sheep Brain Dissection	Entrance Quiz 8 Exit Quiz 8
11/16	**Practical 4**	**Review**	**Open Lab Mon -Wed**	
11/21-11/23	**No Lab**		**Thanksgiving Break**	
11/28-11/30	**No Lab**		Prepare for Lecture Exams	
12/4-12/8	**No Lab**		Lecture Final Exams	

APPROVALS

Department Head Approval Amy Kuenzi
Date 3/26/24

Dean Approval Kristi Tailer
Date 3/27/24

Graduate Council Approval _____
Date _____

CRC Approval _____
Date _____

Faculty Senate Approval _____
Date _____

VCAA Approval (see below) _____
Date _____

Chancellor Approval (see below) _____
Date _____

MontanaTech *Curriculum Change Request Form Dated December 23, 2022*

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.

Final changes are made by the registrar after faculty senate approval and BOR approval, as needed.
See workflow document
https://helpx.adobe.com/acrobat/how-to/convert-word-excel-paper-pdf-forms.html?set=acrobat--fundamentals--pdf-forms
Guidance can be found at: https://mus.edu/che/arsa/academicproposals.html

Submission Requirements: All Submissions (checked by CRC):

- ☐ Electronic Copy (with the exception of signatures- no handwritten items)
- ☐ Completed CRC Form, with all Signatures and Attachments based on level of request (see below)
- ☐ Naming Convention as determined by CRC

LEVEL of Request

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

1. *Faculty Approvals (directly to CRC, then Faculty Senate):*
   - ☐ Establish a new course for the catalog (please contact the Registrar of MUS CCN information) Required Documents:
     - ☐ Course Number
     - ☐ Course Outcomes
     - ☐ Course Description
     - ☐ Syllabus
     - ☐ Curriculum Worksheet
     - ☐ Pre-requisite or co-requisite
   - ■ Course Changes: addition, deletion or change of title, credit, course number, pre-req, description, or cross listing. Required Documents:
     - ☐ Course Number
     - ☐ Course Outcomes
     - ■ Course Description
     - ☐ Syllabus
     - ☐ Pre-requisites or co-requisites
     - ☐ Existing Curriculum Worksheet
     - ☐ New Curriculum Worksheet, with changes highlighted
   - ☐ 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. Required Documents:
     - ☐ **Documents as listed under establishing a new course (as applicable)**
     - ☐ Existing Curriculum Worksheet
     - ☐ New Curriculum Worksheet, with changes highlighted
   - ☐ Other (for those that are considered in this level but otherwise not listed):

     _____

2. *Campus Approvals Level I (must be approved by the VCAA prior to CRC submission):*
   - ☐ Placing a postsecondary educational program into moratorium: Required Documents:
     - ☐ Program Termination and Moratorium Form
     - ☐ Academic Proposal Request Form
   - ☐ Withdrawing a postsecondary educational program from moratorium. Required Documents:
     - ☐ Academic Proposal Request Form

- ☐ Establishing, re-titling, terminating or revising a campus certificate of 29 credits or fewer. Required Documents:
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Establishing a B.A.S./A.A./A.S. area of study. Required Documents:
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Offering an existing postsecondary educational program via distance or online delivery. Required Documents:
  - ☐ Academic Proposal Request Form

3. OCHE Approvals Level I *(must be approved by the VCAA and Chancellor prior to CRC submission)*:
Level I items are those requests for which the Board of Regents has fully designated approval authority to the institution or Commissioner of Higher Education. These requests are to be submitted for notification to or approval by Commissioner as Level I proposals. Level I proposals may be submitted to OCHE at any time by the flagship campuses or community colleges and will be processed on a rolling monthly schedule. The approval of such proposals will be conveyed to the Board of Regents at the next meeting of the board. Level I proposals include campus initiatives typically characterized by minimal costs, clear adherence to approved campus mission, and the absence of significant programmatic impact on other institutions within the MUS and community colleges. BOR Forms can be found using the following link:
https://mus.edu/che/arsa/Forms/AcademicForms.html

- ☐ Re-titling an existing postsecondary educational program. Required Documents:
  - ☐ Academic Proposal Request Form
- ☐ Terminating an existing postsecondary educational program.
  - ☐ Academic Proposal Request Form
  - ☐ Program Termination and Moratorium Form
- ☐ Consolidating existing postsecondary educational programs
  - ☐ Academic Proposal Request Form
  - ☐ Curriculum Proposal Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Establishing a new minor where there is a major or an option in a major
  - ☐ Academic Proposal Request Form
  - ☐ Curriculum Proposal Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Revising a postsecondary educational program
  - ☐ Curriculum Proposal Form
  - ☐ Academic Proposal Request Form
- ☐ Establishing a temporary C.A.S. or A.A.S. degree program Approval limited to 2 years
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**

4. Level II *(must be approved by the VCAA and Chancellor prior to CRC submission)*:
Level II proposals require initial approval and comment by the Board of Regents through a Request to Plan prior to final review and approval by the Office of the Commissioner of Higher Education. These proposals entail more substantive additions to, alterations in, or termination of programs, structures, or administrative or academic entities typically characterized by the (a) addition, reassignment, or elimination or personnel, facilities, or courses of instruction; (b) rearrangement of budgets, cost centers, funding sources; and (c) changes which by implication could impact other MUS institutions and community colleges.

- ☐ Establishing a new postsecondary educational program

- ☐ Request to Plan (RTP)
- ☐ Academic Proposal Request Form
- ☐ Curriculum Proposal
- ☐ Fiscal Analysis Form
- ☐ Completed Intent to Plan Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Permanent authorization for a temporary C.A.S. or A.A.S degree program

- ☐ Academic Proposal Request Form
- ☐ C.A.S/A.A.S Curriculum Proposal
- ☐ Fiscal Analysis Form
- ☐ Completed Intent to Plan Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Exceeding the 120 credit maximum for baccalaureate degrees Exception to policy 301.11

- ☐ Academic Proposal Request Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Forming, eliminating or consolidating an academic, administrative, or research unit

- ☐ Academic Proposal Request Form
- ☐ Curriculum or Center/Institute Proposal
- ☐ Completed Request to Plan, except when eliminating or consolidating
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Re-titling an academic, administrative, or research unit Permanent authorization for a temporary C.A.S. or A.A.S degree program

☐ Curriculum Proposal

☐ Completed Intent to Plan Form

MontanaTech *Curriculum Change Request Form Dated December 23, 2022*

Date 3/25/2024
Dept. Biology **College** CLSPS
Program Biology **CRC Representative** Graff

Description of Request:

Update course description for BIOH 211/212. They are currently listed as combined when the lab was separated from the lecture in the past. The outdated description in the course catalog is creating issues with the new transfer evaluation system.

Current Course or Program Information:

BIOH 211/212 - Anatomy & Physiology II 4 credits (Hrs: 3 Lec, 3 lab).

Number (Assigned By CRC):

Proposed Change

Course #	Name	Credits	Pre-req.

New Course description

BIOH 211 Anatomy & Physiology II
3 credits (hrs: 3 lec)
The second half of a two semester course designed for students pursuing a career in the clinical sciences. The course is developed as a systems approach to structure (anatomy) and function (physiology) of the human body and will present subject matter as it relates to homeostasis and disease processes. Course focuses on organ systems involved with maintenance of health. Topics covered include: the senses, endocrine, cardiovascular, immune, respiratory, digestive, urinary and reproductive systems.

Prerequisite(s): BIOH 201/202 or Consent of Instructor. ~~Satisfies upper division Writing core~~. Course generally offered 2nd semester and summer.

BIOH 212 Anatomy & Physiology II lab
1 credit (hrs 3 lab)
Companion laboratory BIOH 211. Comprehensive study of tissues and gross human anatomy necessary for students in health-related programs. Emphasis on typical structure and function as they relate to health. Topics include senses, endocrine, cardiovascular, immune, respiratory, digestive, urinary and reproductive systems.. Labs involve cadavers. Course generally offered 2nd semester and summer.

Prerequisite(s): BIOH 201/202 or Consent of Instructor.

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

List of supporting documentation attached (See Level of Request for Requirements):

Assessment Leading to Request

Course description was outdated and didn't take into account that the lab and lecture have been separated into 2 courses with separate grades. It was also creating issues with the new transfer software as it was pulling them both up as 3 credits.

Anticipated Impacts to "Other" Programs

None--

Impact on Library: None has consulted with _____ 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 (note that the earliest date is the next calendar year): AY 24-25

Montana Technological University

BIOH 211: Anatomy & Physiology II Lecture
Spring 2024

Lecture: MWF 12:00-12:50 pm Library Auditorium
Instructor: Katherine Mattern
Office: CBB, Rm 222
Email: kmattern@mtech.edu Phone # 406-496-4452
Office Hours: 10:00-11:30; MR, 11:00-12:00 T; or by appointment

Required Course Materials

Lecture Text: Human Anatomy & Physiology, 11th Ed., Marieb, Elaine N. / Hoehn, Katja
Lab Text: Human Anatomy & Physiology Laboratory Manual, 13th ed., Marieb, Elaine N., Smith, Lori A.
OR
Anatomy & Physiology INTEGRATE Custom Lab Manual Good/Johnston (reduced price in bookstore)

Engagement: We will be doing group activities and discussion during lecture, you will be required to bring paper and writing utensils. Your group work will be collected and graded for participation. Please sit with your group and be an active participant in the group questions. This is a great time to clarify your understanding with me and to ask questions you have on the material we are covering.

Course Description

BIOH 211 Human Anatomy and Physiology II is the second half of a two-semester course that is held face-to-face. The course is developed as a systems approach to structure (anatomy) and function (physiology) of the human body and will present subject matter as it relates to homeostasis and disease processes. Second semester topics include special senses, the endocrine system, cardiovascular system, lymphatic system, digestive system, respiratory system, urinary system and reproductive system.

Course Policies

- Your physical attendance in class is critical to your learning and is an expectation of enrollment. A great deal of new and complex terminology and topics will be covered during the course. Do everything you can do be present and engaged during each class. Ask questions and be involved with class discussions. If you are struggling or have questions, please come see me as soon as possible.
- Come to class on time, and with your cell phone on silent, and put away. This is a large lecture, so please be respectful of those learning around you. Any continued disruptions or disrespect may warrant corrective actions and/or removal from the class.
- I will be posting outlines you can use to take notes over the lecture materials we cover. You can print these outlines in advance or take notes in any manner that helps you learn. When you read through the chapters, you should continue to add notes to these outlines so you know what information is important in the chapters.
- Please respect the privacy of those around you. If you wish to take photos or video of the lecture, that should not include your classmates or be used for anything other than to help you learn the material.
- It is your responsibility to read the accompanying chapters listed in this syllabus, as well as to do the assignments on MOODLE. You have several days to complete your homework assignments and no extended time will be given. If you do not complete your homework, the questions will not be accessible to you for review. Use the homework to add to your notes from lecture and reading.
- If you choose to miss class, it is your responsibility to obtain any information (lecture notes, handouts etc.) from another student or any materials posted on MOODLE.
- Exams are scheduled on the syllabus. No make-up exams will be offered unless arrangements are made with me prior to the date of the exam.
- Any student found cheating will receive an F on the exam and will be reported to academic VC for academic dishonesty.

Disabilities

- Montana Tech provides reasonable accommodations to students who are registered with Disability Services. If you have been diagnosed with or believe you may have a disability, contact Disability Services to discuss accommodations, and access needs, and obtain an Accommodation Letter. You can reach the Disability Services Coordinator via email at sgoodell@mtech.edu by phone at 406-496-4428, or in person in the Academic Center for Excellence (ACE) within the Student Success Center (SSC). All services are confidential. Once you have received your letter, please meet with me to discuss your access needs.
- Additional support services are available in tutoring, counseling, careers, for veterans, and financial aid. Please visit https://www.mtech.edu/student-life/services/ for more information.

Student Outcomes

Students who have completed this course should be able to:

- develop a vocabulary of appropriate terminology to effectively communicate information related to anatomy and physiology.
- give examples of how structure of anatomical features relates to specific functions.
- use anatomical knowledge to predict physiological consequences as they pertain to the organization of the human body from the atomic to the organismal level.
- recognize and explain the principle of homeostasis and how feedback loops apply to physiological systems.
- recognize and explain the interrelationships within and between anatomical and physiological systems of the human body.
- synthesize ideas to connect the knowledge of anatomy and physiology to real-world situations, including healthy lifestyle decisions and homeostatic imbalances.

Grading

Your grade in the lecture course will be based on the following:

Lecture Exams *	70%
Participation (lowest dropped)	15%
Assignments (lowest dropped)	15%
Total	100%

Grading scale:

A = 93-100%
A- =90-92%
B+ = 87-89%
B = 84-86%
B- = 80-83%
C+ = 77-79%
C = 74-76%
C- 70-73%
D+ = 67-69%
D = 64-66%
D- = 60-63%
F < 60%

**final exam optional/ can replace lowest exam score*

Successful Course Strategy

Anatomy & Physiology is a difficult course with a large amount of information to learn and memorize. However, it is also highly rewarding and can serve as a "User Guide" to your body, or as the foundational understanding for further biological applications. To do well, you must be prepared to take notes, study, and ask questions. You will need to access MOODLE where your assignments and grades will be located, as well as check your email regularly. A very important responsibility you have is the assigned reading, which should add to your lecture notes and help clarify the content. Review your notes after each class period and set aside time to study every day. If there are things you do not understand, please ask questions in lecture, or come and see me during office hours. In addition, there are many helpful online resources you can choose from to help you study. Please do not save all your reviewing and questions until just before examinations – that will be too late and will reflect poorly on your exams.

I am excited to share in this experience with you and look forward to your success!

Tentative Schedule*

All readings from Human Anatomy and Physiology 11th Edition by E. N. Marieb

Date	Topic	Reading
1/8-1/12	The Special Senses	Chapter 15
1/15	**MLK Day- no class**	
1/17-1/22	The Endocrine System	Chapter 16
1/24/-1/31	Blood	Chapter 17
2/5	**LECTURE EXAM I**	
2/2-2/9	The Cardiovascular System: The Heart	Chapter 18
2/12-2/16	The Cardiovascular System: Blood Vessels	Chapter 19
2/19	**Presidents' Day- no class**	
2/21-2/28	The Lymphatic System	Chapter 20
3/1	**LECTURE EXAM II**	
3/4-3/8	The Immune System	Chapter 21
3/11-3/15	The Respiratory System	Chapter 22
3/18-3/22	**SPRING BREAK**	
3/25-3/27	The Digestive System	Chapter 23
3/29	**Mini Spring Break-No class**	
3/27-4/3	Nutrition, Metabolism, and Energy Balance	Chapter 24
4/5	**LECTURE EXAM III**	
4/8-4/12	The Urinary System	Chapter 25
4/15-4/17	Fluid, Electrolyte, and Acid-Base Balance	Chapter 26
4/19-4/24	The Reproductive System	Chapter 27
4/26	**Lecture Exam IV**	
4/29-5/3	**FINAL EXAM (optional) TBD**	**Cumulative**

** Dates for lecture exams, as well as the syllabus and class materials may be changed by the instructor. New dates and information will be announced in class and also will be posted on MOODLE.*

READ your chapters BEFORE coming to lecture when they are covered.

Montana Technological University

BIOH 212: Anatomy & Physiology II Labs
Spring 2024

Location: CBB 005

Instructor: Katherine Mattern
Office: CBB 222
Email: kmattern@mtech.edu Phone # 406-496-4452
Office Hours: 10:00-11:30; MR, 11:00-12:00 T; or by appointment

Holly Horner
CBB 005
Email: hhorner@mtech.edu Phone# 303-999-7641

Course Materials

Text: Human Anatomy and Physiology Laboratory Manual, 13th Ed., Marieb, Elaine N. / Smith, Lori A

OR

Anatomy & Physiology INTEGRATE Custom Lab Manual Good/Johnston (reduced price in bookstore)

Course Policies

- You will be required to successfully complete a Lab Safety Quiz at the beginning of your lab course. The first week of lab will include a review of proper cadaver use, discussion of how to be successful in lab, and completion of a Lab Safety Quiz. You must earn a 90% or higher on the lab safety quiz in order to stay enrolled in this lab. Failure to complete or pass with a 90% or higher will result in removal from the course.
- When entering the laboratory space, you must be properly attired with close-toed shoes and appropriate length pants and top. Absolutely no food or drinks are allowed in the lab. You may leave your water bottles outside in the hallway or use the nearby drinking fountain.
- When cadavers and cadaver tissues are in use for study, absolutely no cell phones may be used for pictures or recording. A review of appropriate use and behavior of cadavers must be signed by each lab participant prior to cadaver study. Any violation of this will result in removal from the course.
- Attendance in lab is critical to your success. If for some reason you are unable to attend at your assigned time you may inquire with the instructor if there is space to attend during the same week in a different section.
- Because of the intensity involved in setting up lab exams, they will only be given on one day at hourly intervals. You will sign up for a time to take the exam the week before the practical. There will be no other lab exercise on the weeks of lab practical exams.
- Any student found cheating will receive an F on the assessment and will be reported to academic VC for academic dishonesty.

Disabilities

- Montana Tech provides reasonable accommodations to students who are registered with Disability Services. If you have been diagnosed with or believe you may have a disability, contact Disability Services to discuss accommodations, and access needs, and obtain an Accommodation Letter. You can reach the Disability Services Coordinator via email at sgoodell@mtech.edu by phone at 406-496-4428, or in person in the Academic Center for Excellence (ACE) within the Student Success Center (SSC). All services are confidential. Once you have received your letter, please meet with me to discuss your access needs.

Grading

Your grade in the lab will be based on the following:

Lab Practicals (4)	70%
Lab Entrance Quizzes (8)	18%
Lab Exit Quizzes (8)	12%
Total	100%

Grading scale:
A = 93-100%
A- =90-92%
B+ = 87-89%
B = 84-86%
B- = 80-83%
C+ = 77-79%
C = 74-76%
C- 70-73%
D+ = 67-69%
D = 64-66%
D- = 60-63%
F < 60%

BIOH 212/312 A & P 2 Lab Exercises, Lab Quizzes and Practical Exam Schedule Spring 2024

Date	Lab	Topic	Material	Assignments
1/9-1/11	Intro to Lab	Success and Requirements	Cadaver Use Policy Lab Safety Quiz	90% or higher on lab safety quiz
1/16-1/18	**Lab 1** Ex.23, 27	Special Senses & Endocrine System	Eye Dissection Endocrine Cadaver & Fetal Pig	Entrance Quiz 1 = lab safety quiz Exit Quiz 1
1/23-1/25	**Lab 2** Ex.29, 32	Blood and Blood Vessels	Blood Tests and Blood Histology Cadaver Vessels	Entrance Quiz 2 Exit Quiz 2
2/1	**Practical 1**	**Review**	**Open Lab Mon-Wed**	
2/6-2/8	**Lab 3** Ex.30, 33	Heart	Pig Heart Dissection, Blood Pressure, Human Cadaver Heart	Entrance Quiz 3 Exit Quiz 3
2/13-2/15	**Lab 4** Ex.31, 36	Cardiovascular & Respiratory Systems	ECG , Respiratory Cadaver, Histology, Models	Entrance Quiz 4 Exit Quiz 4
2/22	**Practical 2**	**Review**	**Open Lab Mon-Wed**	
2/27-2/29	**Lab5** Ex. 38	Digestive System	Digestive Cadaver and Models	Entrance Quiz 5 Exit Quiz 5
3/5-3/7	**Lab 6** Ex. 38	Digestive System	Digestive Histology	Entrance Quiz 6 Exit Quiz 6
3/14	**Practical 3**	**Review**	**Open Lab Mon-Wed**	
Week of 3/18			**No Labs- SPRING BREAK**	
3/26-3/28	**Lab 7** Ex. 40, 42, 43	Urinary & Reproductive	Urinary Cadaver, Pig Kidney Dissection, Models Reproductive Cadaver and Models	Entrance Quiz 7 Exit Quiz 7
4/2-4/4	**Lab 8** Ex. 42, 43	Reproductive	Reproductive Histology	Entrance Quiz 8 Exit Quiz 8
4/11	**Practical 4**	**Review**	**Open Lab Mon -Wed**	
4/16-4/25	**No Lab**		Prepare for Lecture Exam #4	
4/29-5/3	**No Lab**		Final Exams	

APPROVALS

Department Head Approval _____
Date 3/26/24

Dean Approval Katie Hailer
Date 3/27/24

Graduate Council Approval _____
Date _____

CRC Approval _____
Date _____

Faculty Senate Approval _____
Date _____

VCAA Approval (see below) _____
Date _____

Chancellor Approval (see below) _____
Date _____

MontanaTech *Curriculum Change Request Form Dated December 23, 2022*

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.

Final changes are made by the registrar after faculty senate approval and BOR approval, as needed.
See workflow document
https://helpx.adobe.com/acrobat/how-to/convert-word-excel-paper-pdf-forms.html?set=acrobat--fundamentals--pdf-forms
Guidance can be found at: https://mus.edu/che/arsa/academicproposals.html

Submission Requirements: All Submissions (checked by CRC):

- ☐ Electronic Copy (with the exception of signatures- no handwritten items)
- ☐ Completed CRC Form, with all Signatures and Attachments based on level of request (see below)
- ☐ Naming Convention as determined by CRC

LEVEL of Request

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

1. *Faculty Approvals (directly to CRC, then Faculty Senate):*
   - ☐ Establish a new course for the catalog (please contact the Registrar of MUS CCN information) Required Documents:
     - ☐ Course Number
     - ☐ Course Outcomes
     - ☐ Course Description
     - ☐ Syllabus
     - ☐ Curriculum Worksheet
     - ☐ Pre-requisite or co-requisite
   - ■ Course Changes: addition, deletion or change of title, credit, course number, pre-req, description, or cross listing. Required Documents:
     - ☐ Course Number
     - ☐ Course Outcomes
     - ■ Course Description
     - ☐ Syllabus
     - ☐ Pre-requisites or co-requisites
     - ☐ Existing Curriculum Worksheet
     - ☐ New Curriculum Worksheet, with changes highlighted
   - ☐ 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. Required Documents:
     - ☐ **Documents as listed under establishing a new course (as applicable)**
     - ☐ Existing Curriculum Worksheet
     - ☐ New Curriculum Worksheet, with changes highlighted
   - ☐ Other (for those that are considered in this level but otherwise not listed):

     _____

2. *Campus Approvals Level I (must be approved by the VCAA prior to CRC submission):*
   - ☐ Placing a postsecondary educational program into moratorium: Required Documents:
     - ☐ Program Termination and Moratorium Form
     - ☐ Academic Proposal Request Form
   - ☐ Withdrawing a postsecondary educational program from moratorium. Required Documents:
     - ☐ Academic Proposal Request Form

- ☐ Establishing, re-titling, terminating or revising a campus certificate of 29 credits or fewer. Required Documents:
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Establishing a B.A.S./A.A./A.S. area of study. Required Documents:
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Offering an existing postsecondary educational program via distance or online delivery. Required Documents:
  - ☐ Academic Proposal Request Form

3. OCHE Approvals Level I *(must be approved by the VCAA and Chancellor prior to CRC submission)*:
Level I items are those requests for which the Board of Regents has fully designated approval authority to the institution or Commissioner of Higher Education. These requests are to be submitted for notification to or approval by Commissioner as Level I proposals. Level I proposals may be submitted to OCHE at any time by the flagship campuses or community colleges and will be processed on a rolling monthly schedule. The approval of such proposals will be conveyed to the Board of Regents at the next meeting of the board. Level I proposals include campus initiatives typically characterized by minimal costs, clear adherence to approved campus mission, and the absence of significant programmatic impact on other institutions within the MUS and community colleges. BOR Forms can be found using the following link:
https://mus.edu/che/arsa/Forms/AcademicForms.html

- ☐ Re-titling an existing postsecondary educational program. Required Documents:
  - ☐ Academic Proposal Request Form
- ☐ Terminating an existing postsecondary educational program.
  - ☐ Academic Proposal Request Form
  - ☐ Program Termination and Moratorium Form
- ☐ Consolidating existing postsecondary educational programs
  - ☐ Academic Proposal Request Form
  - ☐ Curriculum Proposal Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Establishing a new minor where there is a major or an option in a major
  - ☐ Academic Proposal Request Form
  - ☐ Curriculum Proposal Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Revising a postsecondary educational program
  - ☐ Curriculum Proposal Form
  - ☐ Academic Proposal Request Form
- ☐ Establishing a temporary C.A.S. or A.A.S. degree program Approval limited to 2 years
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**

4. Level II *(must be approved by the VCAA and Chancellor prior to CRC submission)*:
Level II proposals require initial approval and comment by the Board of Regents through a Request to Plan prior to final review and approval by the Office of the Commissioner of Higher Education. These proposals entail more substantive additions to, alterations in, or termination of programs, structures, or administrative or academic entities typically characterized by the (a) addition, reassignment, or elimination or personnel, facilities, or courses of instruction; (b) rearrangement of budgets, cost centers, funding sources; and (c) changes which by implication could impact other MUS institutions and community colleges.

- ☐ Establishing a new postsecondary educational program

- ☐ Request to Plan (RTP)
- ☐ Academic Proposal Request Form
- ☐ Curriculum Proposal
- ☐ Fiscal Analysis Form
- ☐ Completed Intent to Plan Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Permanent authorization for a temporary C.A.S. or A.A.S degree program

- ☐ Academic Proposal Request Form
- ☐ C.A.S/A.A.S Curriculum Proposal
- ☐ Fiscal Analysis Form
- ☐ Completed Intent to Plan Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Exceeding the 120 credit maximum for baccalaureate degrees Exception to policy 301.11

- ☐ Academic Proposal Request Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Forming, eliminating or consolidating an academic, administrative, or research unit

- ☐ Academic Proposal Request Form
- ☐ Curriculum or Center/Institute Proposal
- ☐ Completed Request to Plan, except when eliminating or consolidating
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Re-titling an academic, administrative, or research unit Permanent authorization for a temporary C.A.S. or A.A.S degree program

☐ Curriculum Proposal

☐ Completed Intent to Plan Form

MontanaTech *Curriculum Change Request Form Dated December 23, 2022*

Date 3/25/2024
Dept. Biology **College** CLSPS
Program Biology **CRC Representative** Graff

Description of Request:

Update course description for BIOH 301/302 They are currently listed as combined when the lab was separated from the lecture in the past. The outdated description in the course catalog is creating issues with the new ransfer evaluation system.

Current Course or Program Information:

BIOH 301/302 - Human Anatomy & Physiology I with Lab 4 credits (Hrs: 3 Lec, 3 lab).

Number (Assigned By CRC):

Proposed Change

Course #	Name	Credits	Pre-req.

New Course description

BIOH 301 - Human Anatomy & Physiology I
3 credits (Hrs: 3 Lec)
For the following majors: Biology, Exercise and Health Science, OSH. Emphasis on structure, function, and homeostatic regulation of body systems. Covers tissues through nervous system.
Prerequisite(s): BIOB 160; CHMY 121 or CHMY 123 or CHMY 141 or Consent of Instructor. Course offered fall semester.
BIOH 302 - Human Anatomy & Physiology I Lab
1 credit (hrs 3 lab)
Companion laboratory BIOH 301. Comprehensive study of tissues and gross human anatomy necessary for students in Biology, Exercise and Health Science and OSH. Emphasis on typical structure and function. Topics include tissues through nervous system. Some labs involve cadavers
Prerequisite(s): BIOB 160; CHMY 121 or CHMY 123 or CHMY 141 or Consent of Instructor. Course offered fall 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 (See Level of Request for Requirements):

Assessment Leading to Request

Course description was outdated and didn't take into account that the lab and lecture have been separated into 2 courses with separate grades. It was also creating issues with the new transfer software as it was pulling them both up as 3 credits.

Anticipated Impacts to "Other" Programs

None--

Impact on Library: None has consulted with _____ 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 (note that the earliest date is the next calendar year): AY 24-25

Montana Tech of the University of Montana
BIOH 301: Human Anatomy and Physiology I
Fall 2023

Lecture: MWF 9:00 p.m. – 9:50 p.m. CBB 102

Instructor: Dr. Amy Kuenzi, Professor
Office: Chemistry and Biology Building, Room 220
Office Phone: 496-4793; Email: AKuenzi@mtech.edu
Office Hours: 10-11; MWF; others by appointment

Required Text: Marieb, E. N. Human Anatomy and Physiology 11th Edition. Older editions of the text will work as well. There will be a copy of the text on reserve in the library as well.

Course Description

BIOH 301 Human Anatomy and Physiology is the first half of a two semester course. The course is developed as a systems approach to structure (anatomy) and function (physiology) of the human body and will present subject matter as it relates to homeostasis and disease processes. First semester topics include an overview of cell biology and histology followed by discussion of the organ systems involved in covering, support and movement of the human body as well as the nervous system.

COURSE POLICIES

- I expect you to arrive to class on time. Although I understand that occasional tardiness is hard to avoid, students habitually arriving late can be very disrupting to me and the other students in the class; I will take corrective action if I feel this is causing serious problems.
- You are expected to attend all classes. In general, poor attendance results in poor class performance. If you are ill and can't attend class, please let me know prior to the start of class and I will record the lecture for you and help you with the material. However, I will not provide any information (lecture notes, handouts, etc.) for a missed lecture unless you make prior arrangements with me.
- Please put your cell phones away prior to class. Texting or playing with your phones while your instructor is lecturing makes your instructor very cranky (which is not a good thing). Don't do it or you will face my wrath and possibly be asked to leave. Don't even think about having your phones out or in your lap during quizzes or exams.
- Another thing that makes your instructor cranky is students continually talking during lectures. If you make a regular habit of it you will be asked to leave.
- Lecture quizzes will be given at various times throughout the semester at the end of class. There will be no makeups for unexcused missed quizzes. These quizzes will be announced ahead of time.
- Exams are scheduled on the syllabus. No make-up exams will be offered unless arrangements are made with me prior to the date of the exam.
- Any student found cheating will receive an F on the exam and will be reported to academic VC for academic dishonesty.

Disabilities

Students with disabilities who believe they may need accommodations in this class are encouraged to contact Montana Tech's Disability Services Coordinators at either 496-4429 (North campus) or 496-3730 (South campus).

STUDENT OUTCOMES

Students who have completed this course should be able to:

- understand the scope of studies in anatomy and physiology and be able to use and understand descriptive anatomical and directional terminology.
- explain the basic concept of homeostasis and how homeostatic mechanisms apply to body systems.
- identify cellular structures and explain their respective functions.
- describe the basic tissues of the body and their location and explain their functions.
- identify and describe the major gross and microscopic anatomical components of the integumentary system and describe the functions of the system.
- identify and describe the major gross and microscopic anatomical components of the skeletal system and explain their functional roles in osteogenesis, repair, and body movement.
- identify and describe the major gross and microscopical anatomical components of the muscular system and explain their functional roles in body movement, maintenance of posture, and heat production.
- identify and describe the major gross and microscopic anatomical components of the nervous system and explain their functional roles in communication, control, and integration.

GRADING

I do not grade on a curve, nor do I provide extra-credit assignments. However, there will be a few extra credit points on exams and periodically there will be opportunities to earn extra points.

Your grade in the course will be based on the following:

Lecture Exams (4 @ 100 points each)	400 points
Lecture Quizzes and or assignments	100 points
Total	500

My grading scale:

A = 90-100%,
B+ = 87-89.9%, B = 84-86% B- 80-83%
C+ = 77-79% C = 74-76% C- 70-73%
D+ = 67-69%, D 64-66%, D- 60-63% F < 60%

Successful Course Strategy

This is a hard class because the material is complex and there are lots of new terms to learn.

I want you all to do well and I am happy to help students who are having trouble with the material but you have to do your part .

To do well in this course you should attend all classes and labs. Be prepared for class. A very important part of this involves reading the assigned sections of your textbook. Make notes from the text and add them to your lecture notes to make a comprehensive discussion of the topic. If there are things you do not understand, ask questions in the next lecture or come to office hours and ask me. Review your notes after each class period and a little bit each day. Use the study guides and vocabulary lists I give you to focus your studying. Come see me if you need clarification on these. Look at the extra resources I post on Moodle. Save your old quizzes and homework and study them before the exam.

Please do not save all your reviewing and questions until just before examinations—it's too late and your test scores will reflect this. **Your will not be able to learn all that we cover the night before an exam.**

TIF YOU ARE HAVING TROUBLE WITH THIS COURSE PLEASE COMES SEE ME FOR HELP AS SOON AS POSSIBLE. I can often explain things in a different way to help you understand the material or give you pointers or resources that are helpful for studying.

TENATIVE* LECTURE/READING/EXAM SCHEDULE

All readings from Human Anatomy and Physiology 11th Edition by E. N. Marieb

Date	Topic	Reading
8/21-8/28	Introduction/Homeostasis	Chapter 1
8/30--9/1	Review of Cell Biology	Chapter 3
(you will also be required to review on your own)		
9/4	**Labor Day---no class!**	
9/6	Review of Cell Biology	Chapter 3
9/8 - 9/13	Histology	Chapter 4
9/15	**LECTURE EXAM I**	
9/18 -9/22	Integumentary System	Chapter 5
9/25 -10/6	Bones and Skeletal Tissue	Chapter 6
10/9-10/13	Articulations (joints)	Chapter 8
10/16	**LECTURE EXAM II**	
10/18-11/6	Muscle physiology	Chapter 9
11/8	**LECTURE EXAM III**	
11/10	**Veterans day---no class**	
11/13-11/20	Nervous system	Chapter 11
11/22-11/26	**Thanksgiving Holiday**	
11/27-12/1	Brain, spinal cord, ANS	Chapter 12, 13, 14 (parts of)
12/5	**FINAL EXAM, 8:00-10:00 am**	

* Dates for lecture exams may be changed by the instructor. New dates will be announced in class and also will be posted on MOODLE.

Montana Technological University

BIOH 302: Human Anatomy & Physiology I Labs
Fall 2023

Location: CBB 005

Instructor: Katherine Mattern
Office: CBB, Rm 222
Email: kmattern@mtech.edu Phone # 406-496-4452
Office Hours: 10:00-11:30; MWF; or by appointment

Dr. Deepa DeSilva
Office: CBB 204B
Email: ddesilva@mtech.edu Phone # 406-496-4227
Office Hours: 8:00-11:00; T and 10:30-1:30; R or by appointment

Holly Horner
CBB 005
Email: hhorner@mtech.edu Phone# 303-999-7641

Course Materials

Text: Human Anatomy and Physiology Laboratory Manual, 13th Ed., Marieb, Elaine N. / Smith, Lori A

OR

Anatomy & Physiology INTEGRATE Custom Lab Manual Good/Johnston (reduced price in bookstore)

Course Policies

- You will be required to successfully complete a Lab Safety Quiz PRIOR to beginning your lab course. There will be no labs the first week of school to allow you time to complete this from MOODLE. If your lab safety quiz is not completed successfully in the allotted time, you will be removed from the course.
- When entering the laboratory space, you must be properly attired with close-toed shoes and an appropriate length pant. Absolutely no food or drinks are allowed in the lab. You may leave your water bottles outside in the hallway or use the nearby drinking fountain.
- When cadavers are in use for study, absolutely no cell phones may be used for pictures or recording. A review of appropriate use and behavior of cadavers must be signed by each lab participant prior to cadaver study. Any violation of this will result in removal from the course.
- Because of the difficulty and time involved in setting up lab exams, they will only be given on one day at hourly intervals. You will sign up for a time to take the exam, as well as times to review during the week. There will be no other lab exercise on the weeks of lab practical exams.

Disabilities

- Montana Tech provides reasonable accommodations to students who are registered with Disability Services. If you have been diagnosed with or believe you may have a disability, contact Disability Services to discuss accommodations, and access needs, and obtain an Accommodation Letter. You can reach the Disability Services Coordinator via email at sgoodell@mtech.edu by phone at 406-496-4428, or in person in the Academic Center for Excellence (ACE) within the Student Success Center (SSC). All services are confidential. Once you have received your letter, please meet with me to discuss your access needs.

Grading

Your grade in the lab will be based on the following:

Lab Practicals (4)	70%
Lab Entrance Quizzes (7)	18%
Lab Exit Quizzes (8)	12%
Total	100%

Grading scale:
A = 93-100%
A- =90-92.9%
B+ = 87-89.9%
B = 84-86%
B- = 80-83%
C+ = 77-79%
C = 74-76%
C- 70-73%
D+ = 67-69%
D = 64-66%
D- = 60-63%
F < 60%

BIOH 202/302 A & P 1 Lab Exercises, Lab Quizzes and Practical Exam Schedule Fall 2023

Date	Lab	Topic	Material	Assignments
8/22-8/23	No Lab	Lab Safety Quiz	Access your materials from MOODLE	90% or higher on lab safety quiz
8/29-8/31	**Lab 1** Ex. 1, 3, 6	Language, Microscopes, Epithelial Tissues	Anatomical Terms, Microscope Parts, Epithelial Tissues & Histology	Entrance Quiz 1 = lab safety quiz Exit Quiz 1
9/5-9/7	**Lab 2** Ex. 6, 7	Connective Tissues & Integumentary System	Connective Tissue Histology and Skin Structures	Entrance Quiz 2 Exit Quiz 2
9/14	**Practical 1**	**Review**	**Open Lab Mon-Wed**	
9/19-9/21	**Lab 3** Ex.8, 9	Axial Skeleton *Cadaver Use	Skull and Vertebrae	Entrance Quiz 3 Exit Quiz 3
9/26-9/28	**Lab 4** Ex. 10	Appendicular Skeleton	Arms and Legs	Entrance Quiz 4 Exit Quiz 4
10/5	**Practical 2**	**Review**	**Open Lab Mon-Wed**	
10/10-10/12	**Lab5** Ex. 11, 13	Joints & Axial Muscles	Shoulder, Hip and Knee Joints; Facial, Neck, Chest, Abdominal and Back Muscles	Entrance Quiz 5 Exit Quiz 5
10/17-10/19	**Lab 6** Ex. 13	Appendicular Muscles	Arm, Forearm, Thigh and Leg Muscles	Entrance Quiz 6 Exit Quiz 6
10/26	**Practical 3**	**Review**	**Open Lab Mon-Wed**	
10/31-11/2	**Lab 7** Ex. 17, 19	Brain, Spinal Cord & Nerves	Brain & Spinal Cord: Regions, Structures; Nerves	Entrance Quiz 7 Exit Quiz 7
11/7-11/9	**Lab 8** Ex. 17	Sheep Brain	Sheep Brain Dissection	Entrance Quiz 8 Exit Quiz 8
11/16	**Practical 4**	**Review**	**Open Lab Mon -Wed**	
11/21-11/23	**No Lab**		**Thanksgiving Break**	
11/28-11/30	**No Lab**		Prepare for Lecture Exams	
12/4-12/8	**No Lab**		Lecture Final Exams	

APPROVALS

Department Head Approval A. Kue
Date 3/26/24

Dean Approval Katie Hailey
Date 3/27/24

Graduate Council Approval _____
Date _____

CRC Approval _____
Date _____

Faculty Senate Approval _____
Date _____

VCAA Approval (see below) _____
Date _____

Chancellor Approval (see below) _____
Date _____

MontanaTech *Curriculum Change Request Form Dated December 23, 2022*

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.

Final changes are made by the registrar after faculty senate approval and BOR approval, as needed.
See workflow document
https://helpx.adobe.com/acrobat/how-to/convert-word-excel-paper-pdf-forms.html?set=acrobat--fundamentals--pdf-forms
Guidance can be found at: https://mus.edu/che/arsa/academicproposals.html

Submission Requirements: All Submissions (checked by CRC):

- ☐ Electronic Copy (with the exception of signatures- no handwritten items)
- ☐ Completed CRC Form, with all Signatures and Attachments based on level of request (see below)
- ☐ Naming Convention as determined by CRC

LEVEL of Request

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

1. *Faculty Approvals (directly to CRC, then Faculty Senate):*
   - ☐ Establish a new course for the catalog (please contact the Registrar of MUS CCN information) Required Documents:
     - ☐ Course Number
     - ☐ Course Outcomes
     - ☐ Course Description
     - ☐ Syllabus
     - ☐ Curriculum Worksheet
     - ☐ Pre-requisite or co-requisite
   - ■ Course Changes: addition, deletion or change of title, credit, course number, pre-req, description, or cross listing. Required Documents:
     - ☐ Course Number
     - ☐ Course Outcomes
     - ■ Course Description
     - ☐ Syllabus
     - ☐ Pre-requisites or co-requisites
     - ☐ Existing Curriculum Worksheet
     - ☐ New Curriculum Worksheet, with changes highlighted
   - ☐ 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. Required Documents:
     - ☐ **Documents as listed under establishing a new course (as applicable)**
     - ☐ Existing Curriculum Worksheet
     - ☐ New Curriculum Worksheet, with changes highlighted
   - ☐ Other (for those that are considered in this level but otherwise not listed):

     _____

2. *Campus Approvals Level I (must be approved by the VCAA prior to CRC submission):*
   - ☐ Placing a postsecondary educational program into moratorium: Required Documents:
     - ☐ Program Termination and Moratorium Form
     - ☐ Academic Proposal Request Form
   - ☐ Withdrawing a postsecondary educational program from moratorium. Required Documents:
     - ☐ Academic Proposal Request Form

- ☐ Establishing, re-titling, terminating or revising a campus certificate of 29 credits or fewer. Required Documents:
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Establishing a B.A.S./A.A./A.S. area of study. Required Documents:
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Offering an existing postsecondary educational program via distance or online delivery. Required Documents:
  - ☐ Academic Proposal Request Form

3. OCHE Approvals Level I *(must be approved by the VCAA and Chancellor prior to CRC submission)*:
Level I items are those requests for which the Board of Regents has fully designated approval authority to the institution or Commissioner of Higher Education. These requests are to be submitted for notification to or approval by Commissioner as Level I proposals. Level I proposals may be submitted to OCHE at any time by the flagship campuses or community colleges and will be processed on a rolling monthly schedule. The approval of such proposals will be conveyed to the Board of Regents at the next meeting of the board. Level I proposals include campus initiatives typically characterized by minimal costs, clear adherence to approved campus mission, and the absence of significant programmatic impact on other institutions within the MUS and community colleges. BOR Forms can be found using the following link:
https://mus.edu/che/arsa/Forms/AcademicForms.html

- ☐ Re-titling an existing postsecondary educational program. Required Documents:
  - ☐ Academic Proposal Request Form
- ☐ Terminating an existing postsecondary educational program.
  - ☐ Academic Proposal Request Form
  - ☐ Program Termination and Moratorium Form
- ☐ Consolidating existing postsecondary educational programs
  - ☐ Academic Proposal Request Form
  - ☐ Curriculum Proposal Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Establishing a new minor where there is a major or an option in a major
  - ☐ Academic Proposal Request Form
  - ☐ Curriculum Proposal Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**
- ☐ Revising a postsecondary educational program
  - ☐ Curriculum Proposal Form
  - ☐ Academic Proposal Request Form
- ☐ Establishing a temporary C.A.S. or A.A.S. degree program Approval limited to 2 years
  - ☐ Academic Proposal Request Form
  - ☐ **Documents as listed under establishing a new course (see section 1)**

4. Level II *(must be approved by the VCAA and Chancellor prior to CRC submission)*:
Level II proposals require initial approval and comment by the Board of Regents through a Request to Plan prior to final review and approval by the Office of the Commissioner of Higher Education. These proposals entail more substantive additions to, alterations in, or termination of programs, structures, or administrative or academic entities typically characterized by the (a) addition, reassignment, or elimination or personnel, facilities, or courses of instruction; (b) rearrangement of budgets, cost centers, funding sources; and (c) changes which by implication could impact other MUS institutions and community colleges.

- ☐ Establishing a new postsecondary educational program

- ☐ Request to Plan (RTP)
- ☐ Academic Proposal Request Form
- ☐ Curriculum Proposal
- ☐ Fiscal Analysis Form
- ☐ Completed Intent to Plan Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Permanent authorization for a temporary C.A.S. or A.A.S degree program

- ☐ Academic Proposal Request Form
- ☐ C.A.S/A.A.S Curriculum Proposal
- ☐ Fiscal Analysis Form
- ☐ Completed Intent to Plan Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Exceeding the 120 credit maximum for baccalaureate degrees Exception to policy 301.11

- ☐ Academic Proposal Request Form
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Forming, eliminating or consolidating an academic, administrative, or research unit

- ☐ Academic Proposal Request Form
- ☐ Curriculum or Center/Institute Proposal
- ☐ Completed Request to Plan, except when eliminating or consolidating
- ☐ **Documents as listed under establishing a new course (see section 1)**

☐ Re-titling an academic, administrative, or research unit Permanent authorization for a temporary C.A.S. or A.A.S degree program

☐ Curriculum Proposal

☐ Completed Intent to Plan Form

Montana Tech *Curriculum Change Request Form Dated December 23, 2022*

Date 3/25/2024
Dept. Biology **College** CLSPS
Program Biology **CRC Representative** Graff

Description of Request:

Update course description for BIOH 311/312 They are currently listed as combined when the lab was separated from the lecture in the past. The outdated description in the course catalog is creating issues with the new ransfer evaluation system.

Current Course or Program Information:

BIOH 311/312 - Human Anatomy & Physiology I with Lab 4 credits (Hrs: 3 Lec, 3 lab).

Number (Assigned By CRC):

Proposed Change

Course #	Name	Credits	Pre-req.

New Course description

BIOH 311 - Human Anatomy & Physiology II
3 credits (Hrs: 3 Lec)
For the following majors: Biology, Exercise and Health Science, OSH. Emphasis on structure, function, and homeostatic regulation of body systems. Covers Endocrine system through Reproductive System.
Prerequisite(s): BIOH 301/302 or Consent of Instructor. Course offered spring semester.

BIOH 312 - Human Anatomy & Physiology II Lab
1 credit (Hrs; 3 lab)
Companion laboratory BIOH 311. Comprehensive study of tissues and gross human anatomy necessary for students in Biology, Exercise and Health Science and OSH. Emphasis on typical structure and function. Topics include Endocrine system through Reproductive system. Some labs involve cadavers
Prerequisite(s): BIOH 301/302 or Consent of Instructor.Course offered spring 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 (See Level of Request for Requirements):

Assessment Leading to Request

Course description was outdated and didn't take into account that the lab and lecture have been separated into 2 courses with separate grades. It was also creating issues with the new transfer software as it was pulling them both up as 3 credits.

Anticipated Impacts to "Other" Programs

None--

Impact on Library: None has consulted with _____ 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 (note that the earliest date is the next calendar year): AY 24-25

Montana Tech of the University of Montana
Biology 311: Anatomy and Physiology II
Spring 2024

Lecture: MWF 9:00 p.m. – 9:50 p.m. CBB 102
Instructor: Dr. Amy Kuenzi, Professor
Office: Chemistry and Biology Building, Room 220
Office Phone: 496-4793; Email: AKuenzi@mtech.edu
Office Hours: 11-12; MWF; others by appointment
Required Text: Marieb, E. N. Human Anatomy and Physiology 11th Edition.

COURSE DESCRIPTION

Anatomy/Physiology 311 is the second half of a two semester course. The course is developed as a systems approach to structure (anatomy) and function (physiology) of the human body and will present subject matter as it relates to homeostasis and disease processes. Second semester topics include the endocrine system, cardiovascular system, lymphatic system, immune system, digestive system, respiratory system, urinary system and reproductive system.

COURSE POLICIES

- You are expected to attend all classes. For the majority of students, poor attendance will result in poor class performance. I do not, however, "grade on" attendance. I do expect you to arrive in class on time. Although I understand that occasional tardiness is hard to avoid, students arriving late can be very disrupting to me and the other students in the class; I will take corrective action if I feel this is causing serious problems.
- If you choose to miss class, it is your responsibility to obtain any information (lecture notes, handouts etc.) from another student. If you need to miss a class due to quarantine or illness, I will provide recorded lectures and work with you regarding any missed material.
- Please turn off your cell phones prior to class. Ringing cell phones are extremely distracting and they make your instructor very cranky (which is not a good thing).
- Texting while your instructor is lecturing also makes your instructor very cranky---even more so than ringing cell phones. Don't do it or you will be asked to leave.
- Cell phones need to be put away and not touched or even looked at during quizzes or exams.
- Lecture quizzes will be given every other Friday at the end of class. There will be no makeups for unexcused missed quizzes.
- Exams are scheduled on the syllabus. No make-up exams will be offered unless arrangements are made with me prior to the date of the exam.
- Any student found cheating will receive an F on the exam.

GRADING

I do not grade on a curve, nor do I provide extra-credit assignments although there will be opportunities to earn extra credit points.

Your grade in the course will be based on the following:

Lecture Exams (4 @ 100 points each)	400 points
Lecture Quizzes and or assignments	100 points
Total	500

* points may vary slightly from the totals here due to number of quizzes or homework but will be close to the numbers provided.

My grading scale:

A = 90-100%
B+ = 87-89.9%, B = 84-86.9% B- 80-83.9%
C+ = 77-79.9% C = 74-76.9% C- 70-73.9%
D+ = 67-69%, D 64-66%, D- 60-63% F < 60%

STUDENT LEARNING OUTCOMES

These outcomes form the foundation for all topics in anatomy and physiology and will be emphasized throughout this course. They are directly linked to the learning outcomes written by the Human Anatomy and Physiology Society (HAPS) Curriculum & Instruction Committee.

1. Develop a vocabulary of appropriate terminology to effectively communicate information related to anatomy and physiology.
2. Recognize the anatomical structures and explain the physiological functions of body systems.
3. Recognize and explain the principle of homeostasis and the use of feedback loops to control physiological systems in the human body.
4. Use anatomical knowledge to predict physiological consequences, and use knowledge of function to predict the features of anatomical structures.
5. Recognize and explain the interrelationships within and between anatomical and physiological systems of the human body.
6. Synthesize ideas to make a connection between knowledge of anatomy and physiology and real-world situations, including healthy lifestyle decisions and homeostatic imbalances.

The general learning outcomes listed below are adapted from material copyrighted by the Human Anatomy and Physiology Society (HAPS) and are topic specific for Human Anatomy and Physiology II.

1. Recognize the anatomical structures, explain physiological functions, and recognize and explain the principle of homeostasis applied to endocrine, circulatory, lymphatic, and immune systems
2. Recognize the anatomical structures, explain physiological functions, and recognize and explain the principle of homeostasis applied to the respiratory system.
3. Recognize the anatomical structures, explain physiological functions, and recognize and explain the principle of homeostasis applied to the urinary system
4. Recognize the anatomical structures, explain physiological functions, and recognize and explain the principle of homeostasis applied to the digestive system.
5. Recognize the anatomical structures, explain physiological functions, and recognize and explain the principle of homeostasis applied to the reproductive system

SUCCESSFUL COURSE STRATEGY

To do well in this course you should attend all classes and labs. Be prepared for class. A very important part of this involves reading the assigned sections of your textbook. Make notes from the text and add them to your lecture notes to make a comprehensive discussion of the topic. If there are things you do not understand, ask questions in the next lecture. Please do not save all your reviewing and questions until just before examinations—it's too late and your test scores will reflect this. Your will not be able to learn all that we cover the night before an exam. If you are having trouble with this course please come see me for help as soon as possible.

Disabilities

Students with disabilities who believe they may need accommodations in this class are encouraged to contact Montana Tech's Disability Services Coordinators at either 496-4429 (North campus) or 496-3730 (South campus).

TENATIVE* LECTURE/READING/EXAM SCHEDULE
All readings from Human Anatomy and Physiology 11th Edition by E. N. Marieb

Date	Topic	Reading
1/8 -1/17	Endocrine system	Chapter 16
1/15	**No Class—MLK day**	
1/19 -1/24	Blood	Chapter 17
1/26– 2/5	Cardiovascular system (heart)	Chapter 18
2/7	**LECTURE EXAM I**	
2/9 -2/14	Cardiovascular system (blood vessels)	Chapter 19
2/16	Lymphatic system	Chapter 20
2/19	**Presidents day no class**	
2/21	Lymphatic System	Chapter 20
2/23-3/11	Immune System	Chapter 21
3/13	**LECTURE EXAM II**	
3/15	Respiratory System	Chapter 22
3/16-3/24	**Spring Break**	
3/25-3/27	Respiratory system	Chapter 22
3/29	**mini spring break—no class**	
4/1-4/8	Digestive system	Chapter 24
4/10	**LECTURE EXAM III**	
4/12-4/19	Urinary system, electrolyte balance	Chapter 25 and 26
4/22 – 4/26	Reproduction system	Chapter 27
5/1	**FINAL EXAM 3:00-5:00 PM**	

*Lecture schedule may be adjusted with the needs of the class. Dates for lecture exams may be changed by the instructor. New dates will be announced in class and also will be posted on MYMTECH (Moodle).

Montana Technological University

BIOH 312: Human Anatomy & Physiology II Lab
Spring 2024

Location: CBB 005
Instructor: Katherine Mattern
Office: CBB 222
Email: kmattern@mtech.edu Phone # 406-496-4452
Office Hours: 10:00-11:30; MR, 11:00-12:00 T; or by appointment

Holly Horner
CBB 005
Email: hhorner@mtech.edu Phone# 303-999-7641

Course Materials

Text: Human Anatomy and Physiology Laboratory Manual, 13th Ed., Marieb, Elaine N. / Smith, Lori A

OR

Anatomy & Physiology INTEGRATE Custom Lab Manual Good/Johnston (reduced price in bookstore)

Course Policies

- You will be required to successfully complete a Lab Safety Quiz at the beginning of your lab course. The first week of lab will include a review of proper cadaver use, discussion of how to be successful in lab, and completion of a Lab Safety Quiz. You must earn a 90% or higher on the lab safety quiz in order to stay enrolled in this lab. Failure to complete or pass with a 90% or higher will result in removal from the course.
- When entering the laboratory space, you must be properly attired with close-toed shoes and appropriate length pants and top. Absolutely no food or drinks are allowed in the lab. You may leave your water bottles outside in the hallway or use the nearby drinking fountain.
- When cadavers and cadaver tissues are in use for study, absolutely no cell phones may be used for pictures or recording. A review of appropriate use and behavior of cadavers must be signed by each lab participant prior to cadaver study. Any violation of this will result in removal from the course.
- Attendance in lab is critical to your success. If for some reason you are unable to attend at your assigned time you may inquire with the instructor if there is space to attend during the same week in a different section.
- Because of the intensity involved in setting up lab exams, they will only be given on one day at hourly intervals. You will sign up for a time to take the exam the week before the practical. There will be no other lab exercise on the weeks of lab practical exams.
- Any student found cheating will receive an F on the assessment and will be reported to academic VC for academic dishonesty.

Disabilities

- Montana Tech provides reasonable accommodations to students who are registered with Disability Services. If you have been diagnosed with or believe you may have a disability, contact Disability Services to discuss accommodations, and access needs, and obtain an Accommodation Letter. You can reach the Disability Services Coordinator via email at sgoodell@mtech.edu by phone at 406-496-4428, or in person in the Academic Center for Excellence (ACE) within the Student Success Center (SSC). All services are confidential. Once you have received your letter, please meet with me to discuss your access needs.

Grading

Your grade in the lab will be based on the following:

Lab Practicals (4)	70%
Lab Entrance Quizzes (8)	18%
Lab Exit Quizzes (8)	12%
Total	100%

Grading scale:
A = 93-100%
A- =90-92%
B+ = 87-89%
B = 84-86%
B- = 80-83%
C+ = 77-79%
C = 74-76%
C- 70-73%
D+ = 67-69%
D = 64-66%
D- = 60-63%
F < 60%

BIOH 212/312 A & P 2 Lab Exercises, Lab Quizzes and Practical Exam Schedule Spring 2024

Date	Lab	Topic	Material	Assignments
1/9-1/11	Intro to Lab	Success and Requirements	Cadaver Use Policy Lab Safety Quiz	90% or higher on lab safety quiz
1/16-1/18	**Lab 1** Ex.23, 27	Special Senses & Endocrine System	Eye Dissection Endocrine Cadaver & Fetal Pig	Entrance Quiz 1 = lab safety quiz Exit Quiz 1
1/23-1/25	**Lab 2** Ex.29, 32	Blood and Blood Vessels	Blood Tests and Blood Histology Cadaver Vessels	Entrance Quiz 2 Exit Quiz 2
2/1	**Practical 1**	**Review**	**Open Lab Mon-Wed**	
2/6-2/8	**Lab 3** Ex.30, 33	Heart	Pig Heart Dissection, Blood Pressure, Human Cadaver Heart	Entrance Quiz 3 Exit Quiz 3
2/13-2/15	**Lab 4** Ex.31, 36	Cardiovascular & Respiratory Systems	ECG , Respiratory Cadaver, Histology, Models	Entrance Quiz 4 Exit Quiz 4
2/22	**Practical 2**	**Review**	**Open Lab Mon-Wed**	
2/27-2/29	**Lab5** Ex. 38	Digestive System	Digestive Cadaver and Models	Entrance Quiz 5 Exit Quiz 5
3/5-3/7	**Lab 6** Ex. 38	Digestive System	Digestive Histology	Entrance Quiz 6 Exit Quiz 6
3/14	**Practical 3**	**Review**	**Open Lab Mon-Wed**	
Week of 3/18			**No Labs- SPRING BREAK**	
3/26-3/28	**Lab 7** Ex. 40, 42, 43	Urinary & Reproductive	Urinary Cadaver, Pig Kidney Dissection, Models Reproductive Cadaver and Models	Entrance Quiz 7 Exit Quiz 7
4/2-4/4	**Lab 8** Ex. 42, 43	Reproductive	Reproductive Histology	Entrance Quiz 8 Exit Quiz 8
4/11	**Practical 4**	**Review**	**Open Lab Mon -Wed**	
4/16-4/25	**No Lab**		Prepare for Lecture Exam #4	
4/29-5/3	**No Lab**		Final Exams	

APPROVALS

Department Head Approval _____
Date 3/26/24

Dean Approval Katie Hunter
Date 3/27/24

Graduate Council Approval _____
Date _____

CRC Approval _____
Date _____

Faculty Senate Approval _____
Date _____

VCAA Approval (see below) _____
Date _____

Chancellor Approval (see below) _____
Date _____