Institutional representatives should provide direct links to PDF documents for each of the curriculum requests represented below. All requests should be posted on the campus Curriculum and Instruction website one week prior to the Academic Affairs Council meeting where the curriculum request is being considered.

### New Unique Course

<table>
<thead>
<tr>
<th>Prefix &amp; Number</th>
<th>Course Title</th>
<th>Approval Date</th>
<th>Approval</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEE 624</td>
<td>Environmental Life Cycle Assessment</td>
<td></td>
<td>RH</td>
</tr>
<tr>
<td>CEE 626</td>
<td>Advanced Water Treatment</td>
<td></td>
<td>RH</td>
</tr>
<tr>
<td>CHEM 480/580</td>
<td>Toxicology</td>
<td>6/24/22</td>
<td>RH</td>
</tr>
<tr>
<td>GEOL 710</td>
<td>Advanced Mapping Techniques</td>
<td></td>
<td>RH</td>
</tr>
<tr>
<td>ME 456</td>
<td>Fundamentals of Automotive Engineering</td>
<td></td>
<td>RH</td>
</tr>
<tr>
<td>ME 456L</td>
<td>Fundamentals of Automotive Engineering Lab</td>
<td></td>
<td>RH</td>
</tr>
<tr>
<td>ME 462/562</td>
<td>Introduction to Batteries and Energy Storage</td>
<td></td>
<td>RH</td>
</tr>
<tr>
<td>ME 466/566</td>
<td>Aerospace Structures</td>
<td></td>
<td>RH</td>
</tr>
<tr>
<td>ME 466L/566L</td>
<td>Aerospace Structures Lab</td>
<td></td>
<td>RH</td>
</tr>
<tr>
<td>ME 467/567</td>
<td>Rockets and Mission Analysis</td>
<td></td>
<td>RH</td>
</tr>
<tr>
<td>ME 468/568</td>
<td>Rockets and Propulsion</td>
<td></td>
<td>RH</td>
</tr>
<tr>
<td>ME 469/569</td>
<td>Aircraft Stability and Control</td>
<td></td>
<td>RH</td>
</tr>
<tr>
<td>ME 662</td>
<td>Energy Storage Devices</td>
<td></td>
<td>RH</td>
</tr>
<tr>
<td>ME 681</td>
<td>Reliability in Mechanical Systems</td>
<td></td>
<td>RH</td>
</tr>
<tr>
<td>MET 300/300L</td>
<td>Applied Glass and Ceramic Engineering</td>
<td>6/24/22</td>
<td>RH</td>
</tr>
<tr>
<td>MET 400/500</td>
<td>Fundamentals of Glass and Ceramic Engineering</td>
<td>6/24/22</td>
<td>RH</td>
</tr>
<tr>
<td>MET 485/585</td>
<td>Powder Metallurgy</td>
<td></td>
<td>RH</td>
</tr>
<tr>
<td>PHYS 449/549</td>
<td>Computational Physics</td>
<td></td>
<td>RH</td>
</tr>
</tbody>
</table>

### Revised Course Requests

<table>
<thead>
<tr>
<th>Prefix &amp; Number</th>
<th>Course Title</th>
<th>Approval Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>MET 110</td>
<td>Introduction to Metallurgical Engineering</td>
<td>6/24/22</td>
</tr>
<tr>
<td>CSC 413</td>
<td>Introduction to Virtual Reality</td>
<td></td>
</tr>
<tr>
<td>Math 123</td>
<td>Calculus I</td>
<td></td>
</tr>
</tbody>
</table>

Courses referenced above for approval have been reviewed by the Academic Affairs Council and the System Vice President for Academic Affairs and may be advanced forward for entry in the student information system. For those courses listed above that did not receive approval, additional clarification or justification will be necessary and should be re-routed through the curriculum review process on a separate “Institutional Curriculum Requests” form once all issues have been resolved.
New Course Request

Use this form to request a new common or unique course. Consult the system course database through for information about existing courses before submitting this form.

<table>
<thead>
<tr>
<th>Institution</th>
<th>Division/Department</th>
<th>2/18/2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDSM&amp;T</td>
<td>Civil and Environmental Engineering</td>
<td></td>
</tr>
</tbody>
</table>

Institutional Approval Signature

Date

Section 1. Course Title and Description

If the course contains a lecture and laboratory component, identify both the lecture and laboratory numbers (xxx and xxxL) and credit hours associated with each. Provide the complete description as you wish it to appear in the system course database, including pre-requisites, co-requisites, and registration restrictions.

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEE 624</td>
<td>Environmental Life Cycle Assessment</td>
<td>3</td>
</tr>
</tbody>
</table>

NOTE: The Enrollment Services Center assigns the short, abbreviated course title that appears on transcripts. The short title is limited to 30 characters (including spaces); meaningful but concise titles are encouraged due to space limitations in the student information system.

Course Description

Environmental life-cycle assessment (ELCA) is a framework for evaluation of the environmental consequences of products, services, and engineering systems. ELCA allows for consistent comparisons of alternate system designs for their environmental performances. This involves the assessment of multiple environmental impact categories from climate change via acidification to toxic impacts. This course is a graduate-level introduction to ELCA and presents applications of ELCA to various designs, including photovoltaic systems, water management systems, etc.

NOTE: Course descriptions are short, concise summaries that typically do not exceed 75 words. DO: Address the content of the course and write descriptions using active verbs (e.g., explore, learn, develop, etc.). DO NOT: Repeat the title of the course, layout the syllabus, use pronouns such as “we” and “you,” or rely on specialized jargon, vague phrases, or clichés.

Pre-requisites or Co-requisites (add lines as needed)

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Pre-Req/Co-Req?</th>
</tr>
</thead>
</table>

Registration Restrictions
Section 2. Review of Course

2.1. Will this be a unique or common course (place an “X” in the appropriate box)?

☒ Unique Course
If the request is for a unique course, institutions must review the common course catalog in the system course database to determine if a comparable common course already exists. List the two closest course matches in the common course catalog and provide a brief narrative explaining why the proposed course differs from those listed. If a search of the common course catalog determines an existing common course exists, complete the Authority to Offer an Existing Course Form. Courses requested without an attempt to find comparable courses will not be reviewed.

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABE 662</td>
<td>Life Cycle Assessment</td>
<td>3</td>
</tr>
<tr>
<td>CEE 425/525</td>
<td>Sustainable Engineering</td>
<td>3</td>
</tr>
</tbody>
</table>

Provide explanation of differences between proposed course and existing system catalog courses below:

ABE 662 offered at SDSU focuses on the societal aspects of life cycle assessment and CEE 425/525 offered at SD Mines is focused on sustainability but offers a brief introduction to Life Cycle Analysis tools. Unlike ABE 662, CEE 624 will focus primarily on the environmental aspects of life cycle assessment and will provide a theoretical background of LCA tools and applications that are not provided in CEE 425/525.

☐ Common Course
Indicate universities that are proposing this common course:

☐ BHSU ☐ DSU ☐ NSU ☐ SDSMT ☐ SDSU ☐ USD

Section 3. Other Course Information

3.1. Are there instructional staffing impacts?

☐ No. Replacement of

(course prefix, course number, name of course, credits)

*Attach course deletion form

Effective date of deletion:  Click here to enter a date.

☒ No. Schedule Management, explain below: This course will be part of Dr. Celik’s regular teaching rotation

☐ Yes. Specify below:

3.2. Existing program(s) in which course will be offered (i.e., any current or pending majors, minors, certificates, etc.):
Civil and Environmental Engineering and Sustainability Engineering Minor Program.

3.3. Proposed instructional method by university (as defined by AAC Guideline 5.4): R-Lecture
If requesting an instructional method that is exempt from the Section Size Guidelines, please provide a brief description of how the course is appropriate for the instructional method, as defined in AAC Guidelines.

3.4. Proposed delivery method by university (as defined by AAC Guideline 5.5): 001-Face-to-face
   In-person. Additionally, the online streaming option will be provided for out-of-campus students.

3.5. Term change will be effective: Fall 2022

3.6. Can students repeat the course for additional credit?
   □ Yes, total credit limit: __________  ☒ No

3.7. Will grade for this course be limited to S/U (pass/fail)?
   □ Yes  ☒ No

3.8. Will section enrollment be capped?
   □ Yes, max per section: __________  ☒ No

3.9. Will this course equate (i.e., be considered the same course for degree completion) with any other unique or common courses in the common course system database?
   □ Yes  ☒ No
   If yes, indicate the course(s) to which the course will equate (add lines as needed):

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
</tr>
</thead>
</table>

3.10. Is this prefix approved for your university?
   ☒ Yes  □ No
   If no, provide a brief justification below:

   ________________________________________________________________

Section 4. Department and Course Codes (Completed by University Academic Affairs)

4.1. University Department:  CEE

4.2. Banner Department Code:  MCEE

4.3. Proposed CIP Code:  140801
   Is this a new CIP code for the university?  □ Yes  ☒ No
New Course Request

Use this form to request a new common or unique course. Consult the system course database through for information about existing courses before submitting this form.

SDSM&T  Civil and Environmental Engineering
Institution  Division/Department  2/14/2022

Institutional Approval Signature  Date

Section 1. Course Title and Description
If the course contains a lecture and laboratory component, identify both the lecture and laboratory numbers (xxx and xxxL) and credit hours associated with each. Provide the complete description as you wish it to appear in the system course database, including pre-requisites, co-requisites, and registration restrictions.

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEE 626</td>
<td>Advanced Water Treatment</td>
<td>(3-0) 3</td>
</tr>
</tbody>
</table>

NOTE: The Enrollment Services Center assigns the short, abbreviated course title that appears on transcripts. The short title is limited to 30 characters (including spaces); meaningful but concise titles are encouraged due to space limitations in the student information system.

Course Description
A course in the theory and practice of advanced water treatment processes. Emphases on advanced design and analysis of physical, and chemical environmental engineering unit operations and processes.

NOTE: Course descriptions are short, concise summaries that typically do not exceed 75 words. DO: Address the content of the course and write descriptions using active verbs (e.g., explore, learn, develop, etc.). DO NOT: Repeat the title of the course, layout the syllabus, use pronouns such as “we” and “you,” or rely on specialized jargon, vague phrases, or clichés.

Pre-requisites or Co-requisites (add lines as needed)

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Pre-Req/Co-Req?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Registration Restrictions

AAC Form 1.5 – New Course Request
(Last Revised 09/2020)
**Section 2. Review of Course**

2.1. Will this be a unique or common course *(place an “X” in the appropriate box)*?

☒ Unique Course

*If the request is for a unique course, institutions must review the common course catalog in the system course database to determine if a comparable common course already exists. List the two closest course matches in the common course catalog and provide a brief narrative explaining why the proposed course differs from those listed. If a search of the common course catalog determines an existing common course exists, complete the Authority to Offer an Existing Course Form. Courses requested without an attempt to find comparable courses will not be reviewed.*

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 482/582</td>
<td>Environmental Chemistry (SDSMT)</td>
<td>3</td>
</tr>
<tr>
<td>CEE 426/526</td>
<td>Environmental Engineering Unit Operations and Processes</td>
<td>3</td>
</tr>
</tbody>
</table>

*Provide explanation of differences between proposed course and existing system catalog courses below:*

While the two closest course matches mainly provide the chemistry fundamentals and design criteria on conventional chemical processes of the environment, the proposed course focuses on the theory and practice of advanced water treatment technologies, particularly drinking water purification.

☐ Common Course

*Indicate universities that are proposing this common course:*

☐ BHSU  ☐ DSU  ☐ NSU  ☐ SDSMT  ☐ SDSU  ☐ USD

**Section 3. Other Course Information**

3.1. Are there instructional staffing impacts?

☐ No. Replacement of

*(course prefix, course number, name of course, credits)*

*Attach course deletion form*

Effective date of deletion:  Click here to enter a date.

☒ No. Schedule Management, explain below:

This course is being offered by a new faculty Tao Ye as part of his regular teaching rotation.

☐ Yes. Specify below:

3.2. Existing program(s) in which course will be offered (i.e., any current or pending majors, minors, certificates, etc.): CENE graduate program

3.3. Proposed instructional method by university *(as defined by AAC Guideline 5.4)*: Lecture-R
If requesting an instructional method that is exempt from the Section Size Guidelines, please provide a brief description of how the course is appropriate for the instructional method, as defined in AAC Guidelines.

3.4. Proposed delivery method by university (as defined by AAC Guideline 5.5): Face-to-face 001

3.5. Term change will be effective: Fall 2022

3.6. Can students repeat the course for additional credit?  
☐ Yes, total credit limit: __________  ☒ No

3.7. Will grade for this course be limited to S/U (pass/fail)?  
☐ Yes  ☒ No

3.8. Will section enrollment be capped?  
☐ Yes, max per section: __________  ☒ No

3.9. Will this course equate (i.e., be considered the same course for degree completion) with any other unique or common courses in the common course system database?  
☐ Yes  ☒ No

If yes, indicate the course(s) to which the course will equate (add lines as needed):

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
</tr>
</thead>
</table>

3.10. Is this prefix approved for your university?  
☒ Yes  ☐ No

If no, provide a brief justification below:

Section 4. Department and Course Codes (Completed by University Academic Affairs)

4.1. University Department:  
CEE

4.2. Banner Department Code:  
MCEE

4.3. Proposed CIP Code:  
140801

Is this a new CIP code for the university?  
☐ Yes  ☒ No
Use this form to request a new common or unique course. Consult the system course database through for information about existing courses before submitting this form.

SDSM&T
Institution

Chemistry, Biology, and Health Sciences
Division/Department

12/3/2021

Institutional Approval Signature

Section 1. Course Title and Description
If the course contains a lecture and laboratory component, identify both the lecture and laboratory numbers (xxx and xxxL) and credit hours associated with each. Provide the complete description as you wish it to appear in the system course database, including pre-requisites, co-requisites, and registration restrictions.

Prefix & No. | Course Title | Credits
--- | --- | ---
CHEM 480/580 | Toxicology | 3

NOTE: The Enrollment Services Center assigns the short, abbreviated course title that appears on transcripts. The short title is limited to 30 characters (including spaces); meaningful but concise titles are encouraged due to space limitations in the student information system.

Course Description
Terminology and methods used to describe and quantify the relative toxicity of different chemicals and materials to human beings and the environment. The classification of toxic substances, legal and regulatory aspects, industrial hygiene, risk management, and reduction of toxins in the environment.

Students registered in 580 will be held to a higher standard than students in 480.

NOTE: Course descriptions are short, concise summaries that typically do not exceed 75 words. DO: Address the content of the course and write descriptions using active verbs (e.g., explore, learn, develop, etc.). DO NOT: Repeat the title of the course, layout the syllabus, use pronouns such as “we” and “you,” or rely on specialized jargon, vague phrases, or clichés.

Pre-requisites or Co-requisites (add lines as needed)

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Pre-Req/Co-Req?</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 114</td>
<td>General Chemistry II</td>
<td>Pre-requisite</td>
</tr>
<tr>
<td>CHEM 114L</td>
<td>General Chemistry II Lab</td>
<td>Pre-requisite</td>
</tr>
</tbody>
</table>

Registration Restrictions
Section 2. Review of Course

2.1. Will this be a unique or common course (place an “X” in the appropriate box)?

☒ Unique Course

If the request is for a unique course, institutions must review the common course catalog in the system course database to determine if a comparable common course already exists. List the two closest course matches in the common course catalog and provide a brief narrative explaining why the proposed course differs from those listed. If a search of the common course catalog determines an existing common course exists, complete the Authority to Offer an Existing Course Form. Courses requested without an attempt to find comparable courses will not be reviewed.

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 484</td>
<td>Chemical Toxicology</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 466</td>
<td>Environmental Toxic Substance/Contaminants</td>
<td>3</td>
</tr>
<tr>
<td>IENG 431/531</td>
<td>Industrial Hygiene</td>
<td>3</td>
</tr>
</tbody>
</table>

Provide explanation of differences between proposed course and existing system catalog courses below:

This unique course examines how the toxicity of materials are determined, uniformly communicated, governmentally regulated, how the risk of exposure can be minimized, and identifies toxins currently found in the environment and their devastating impact. Learning about environmental sustainability looks at past mistakes that must be avoided in the future through green chemistry principles. None of the existing courses are similar to this proposed course.

☐ Common Course

Indicate universities that are proposing this common course:

☐ BHSU  ☐ DSU  ☐ NSU  ☐ SDSMT  ☐ SDSU  ☐ USD

Section 3. Other Course Information

3.1. Are there instructional staffing impacts?

☒ No. Replacement of ________________________________

(course prefix, course number, name of course, credits)

*Attach course deletion form

Effective date of deletion: ____________________

☒ No. Schedule Management, explain below:

Will be taught by current faculty as part of their regular rotation

☐ Yes. Specify below:

3.2. Existing program(s) in which course will be offered (i.e., any current or pending majors, minors, certificates, etc.):

B.S. Chemistry, B.S. Biology, M.S. Green and Sustainable Chemistry
3.3. **Proposed instructional method by university (as defined by AAC Guideline 5.4 addresses):**

   *If requesting an instructional method that is exempt from the Section Size Guidelines, please provide a brief description of how the course is appropriate for the instructional method, as defined in AAC Guidelines.*

   Lecture

3.4. **Proposed delivery method by university (as defined by AAC Guideline 5.5):**

   001 Face-to-face

3.5. **Term change will be effective:**

   Spring 2023

3.6. **Can students repeat the course for additional credit?**

   □ Yes, total credit limit: _________ ☒ No

3.7. **Will grade for this course be limited to S/U (pass/fail)?**

   □ Yes ☒ No

3.8. **Will section enrollment be capped?**

   □ Yes, max per section: _________ ☒ No

3.9. **Will this course equate (i.e., be considered the same course for degree completion) with any other unique or common courses in the common course system database?**

   □ Yes ☒ No

   *If yes, indicate the course(s) to which the course will equate (add lines as needed):*

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
</tr>
</thead>
</table>

3.10. **Is this prefix approved for your university?**

   ☒ Yes □ No

   *If no, provide a brief justification below:*

   

**Section 4. Department and Course Codes (Completed by University Academic Affairs)**

4.1. **University Department:** Chemistry, Biology, and Health Sciences

4.2. **Banner Department Code:** MCBH

4.3. **Proposed CIP Code:** 40.0501

   *Is this a new CIP code for the university?* □ Yes ☒ No
Use this form to request a new common or unique course. Consult the system course database through for information about existing courses before submitting this form.

SDSM&T Geology and Geological Engineering
Institution Division/Department 1/12/2022

Institutional Approval Signature Date

### Section 1. Course Title and Description

If the course contains a lecture and laboratory component, identify both the lecture and laboratory numbers (xxx and xxxL) and credit hours associated with each. Provide the complete description as you wish it to appear in the system course database, including pre-requisites, co-requisites, and registration restrictions.

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOL 710</td>
<td>Advanced Mapping Techniques</td>
<td>(3-0) 3</td>
</tr>
</tbody>
</table>

**NOTE:** The Enrollment Services Center assigns the short, abbreviated course title that appears on transcripts. The short title is limited to 30 characters (including spaces); meaningful but concise titles are encouraged due to space limitations in the student information system.

### Course Description

A survey of advanced research tools related to generating, compiling, describing, interpreting, and presenting spatial data for use in Earth Science research. Curriculum will include geologic mapping in a research setting, best practices for extracting quantitative information from maps/images, and implementation of techniques for generating effective visual aids for use in proposals and publications.

**NOTE:** Course descriptions are short, concise summaries that typically do not exceed 75 words. **DO:** Address the content of the course and write descriptions using active verbs (e.g., explore, learn, develop, etc.). **DO NOT:** Repeat the title of the course, layout the syllabus, use pronouns such as “we” and “you,” or rely on specialized jargon, vague phrases, or clichés.

### Pre-requisites or Co-requisites (add lines as needed)

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Pre-Req/Co-Req?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Registration Restrictions

**Graduate Standing**
Section 2. Review of Course

2.1. Will this be a unique or common course (place an “X” in the appropriate box)?

☑ Unique Course

If the request is for a unique course, institutions must review the common course catalog in the system course database to determine if a comparable common course already exists. List the two closest course matches in the common course catalog and provide a brief narrative explaining why the proposed course differs from those listed. If a search of the common course catalog determines an existing common course exists, complete the Authority to Offer an Existing Course Form. Courses requested without an attempt to find comparable courses will not be reviewed.

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOL 410</td>
<td>Field Geology</td>
<td>0-6</td>
</tr>
<tr>
<td>GEOL 322</td>
<td>Structural Geology</td>
<td>2-1</td>
</tr>
</tbody>
</table>

Provide explanation of differences between proposed course and existing system catalog courses below:

Multiple undergraduate courses in GEOL and GEOE teach and/or emphasize geologic mapping as a tool to collect/store spatial geological data. The proposed course is a graduate course that aims to present graduate students with sophisticated methods of systematically collecting, manipulating, and describing spatial data (not necessarily restricted to maps sensu stricto). As such, it will build upon material covered in the undergraduate courses.

☐ Common Course

Indicate universities that are proposing this common course:

☐ BHSU ☐ DSU ☐ NSU ☐ SDSMT ☐ SDSU ☐ USD

Section 3. Other Course Information

3.1. Are there instructional staffing impacts?

☐ No. Replacement of

(course prefix, course number, name of course, credits)

*Attach course deletion form

Effective date of deletion: Click here to enter a date.

☑ No. Schedule Management, explain below:

Dr. Trevor Waldien (asst. professor of Geology) will offer this course every other year as part of his regular teaching rotation

☐ Yes. Specify below:
3.2. Existing program(s) in which course will be offered (i.e., any current or pending majors, minors, certificates, etc.):
Department of Geology and Geological Engineering. Course is open to M.S., and Ph.D. students

3.3. Proposed instructional method by university (as defined by AAC Guideline 5.4):
If requesting an instructional method that is exempt from the Section Size Guidelines, please provide a brief description of how the course is appropriate for the instructional method, as defined in AAC Guidelines.
R- in person

3.4. Proposed delivery method by university (as defined by AAC Guideline 5.5): 001-lecture

3.5. Term change will be effective: Fall 2022

3.6. Can students repeat the course for additional credit?
☐ Yes, total credit limit: __________ ☒ No

3.7. Will grade for this course be limited to S/U (pass/fail)?
☐ Yes ☒ No

3.8. Will section enrollment be capped?
☒ Yes, max per section: 10 _______ ☐ No

3.9. Will this course equate (i.e., be considered the same course for degree completion) with any other unique or common courses in the common course system database?
☐ Yes ☒ No
If yes, indicate the course(s) to which the course will equate (add lines as needed):

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
</tr>
</thead>
</table>

3.10. Is this prefix approved for your university?
☒ Yes ☐ No
If no, provide a brief justification below:

Section 4. Department and Course Codes (Completed by University Academic Affairs)

4.1. University Department: GGE

4.2. Banner Department Code: MGGE

4.3. Proposed CIP Code: 400601
Is this a new CIP code for the university? ☐ Yes ☒ No
Use this form to request a new common or unique course. Consult the system course database through for information about existing courses before submitting this form.

Section 1. Course Title and Description
If the course contains a lecture and laboratory component, identify both the lecture and laboratory numbers (xxx and xxxL) and credit hours associated with each. Provide the complete description as you wish it to appear in the system course database, including pre-requisites, co-requisites, and registration restrictions.

Prefix & No. | Course Title | Credits
--- | --- | ---
ME 456 | Fundamentals of Automotive Engineering | 3

NOTE: The Enrollment Services Center assigns the short, abbreviated course title that appears on transcripts. The short title is limited to 30 characters (including spaces); meaningful but concise titles are encouraged due to space limitations in the student information system.

Course Description
A thorough overview from the history of transportation through the technical developments needed for modern vehicles. Engine development, drivetrain components, and some of the related technical issues are studied. Current trends in electric and hybrid vehicles are examined for a variety of applications.

NOTE: Course descriptions are short, concise summaries that typically do not exceed 75 words. DO: Address the content of the course and write descriptions using active verbs (e.g., explore, learn, develop, etc.). DO NOT: Repeat the title of the course, layout the syllabus, use pronouns such as “we” and “you,” or rely on specialized jargon, vague phrases, or clichés.

Pre-requisites or Co-requisites (add lines as needed)

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Pre-Req/Co-Req?</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 312</td>
<td>Thermodynamics II</td>
<td>pre-req</td>
</tr>
<tr>
<td>ME 316</td>
<td>Solid Mechanics II</td>
<td>pre-req</td>
</tr>
</tbody>
</table>

Registration Restrictions
Section 2. Review of Course

2.1. Will this be a unique or common course (*place an “X” in the appropriate box)?

☒ Unique Course

If the request is for a unique course, institutions must review the common course catalog in the system course database to determine if a comparable common course already exists. List the two closest course matches in the common course catalog and provide a brief narrative explaining why the proposed course differs from those listed. If a search of the common course catalog determines an existing common course exists, complete the Authority to Offer an Existing Course Form. Courses requested without an attempt to find comparable courses will not be reviewed.

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<tr>
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<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 455</td>
<td>Vehicle Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>ME 412</td>
<td>Internal Combustion Engines</td>
<td>3</td>
</tr>
</tbody>
</table>

Provide explanation of differences between proposed course and existing system catalog courses below:

Although there would be some overlap with these listed courses, the majority of the content would be significantly different and the emphasis would have an entirely different focus.

ME 455  Vehicle Dynamics has primary focus regarding handling issues, suspension basics, and vehicle performance characteristics. These topics would be covered in the proposed new course, but would be a minor portion of the new course.

ME 412  Internal Combustion Engines has its complete emphasis based around the power source of the past 100 + years. This topic would be a key component of the new course, but the new course would also have a significant segment covering both hybrid and electric vehicle systems as well as other potential fuels for use in conventional engines.

☐ Common Course   Indicate universities that are proposing this common course:

☐ BHSU   ☐ DSU   ☐ NSU   ☐ SDSMT   ☐ SDSU   ☐ USD

Section 3. Other Course Information

3.1. Are there instructional staffing impacts?

☐ No. Replacement of

(course prefix, course number, name of course, credits)

*Attach course deletion form

Effective date of deletion: [Click here to enter a date.]

☒ No. Schedule Management, explain below:

Ardell Knudson, Instructor in Mechanical Engineering, has taught this course as a special topics. That will be worked into his regular course rotation.
☐ Yes. Specify below:

3.2. **Existing program(s) in which course will be offered (i.e., any current or pending majors, minors, certificates, etc.):** Senior elective for BSME degree

3.3. **Proposed instructional method by university (as defined by AAC Guideline 5.4):**

    course will consist of lecture, projects, input from various outside contributors, some shop tours, and possible museum visits.

    R Lecture – for ME 456

3.4. **Proposed delivery method by university (as defined by AAC Guideline 5.5):**

    001 Face-to-face Term Based Instruction

3.5. **Term change will be effective:** Fall 2022

3.6. **Can students repeat the course for additional credit?**

    ☐ Yes, total credit limit: _______________ ☒ No

3.7. **Will grade for this course be limited to S/U (pass/fail)?**

    ☐ Yes ☒ No

3.8. **Will section enrollment be capped?**

    ☒ Yes, max per section: 25 ☐ No

3.9. **Will this course equate (i.e., be considered the same course for degree completion) with any other unique or common courses in the common course system database?**

    ☐ Yes ☒ No

    *If yes, indicate the course(s) to which the course will equate (add lines as needed):*

<table>
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<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3.10. **Is this prefix approved for your university?**

    ☒ Yes ☐ No

    *If no, provide a brief justification below:*

    [Blank space for justification]

---

**Section 4. Department and Course Codes (Completed by University Academic Affairs)**

4.1. **University Department:** ME

4.2. **Banner Department Code:** MMEC
4.3. **Proposed CIP Code:** 141901

*Is this a new CIP code for the university?* ☒ No
SOUTH DAKOTA BOARD OF REGENTS
ACADEMIC AFFAIRS FORMS

New Course Request

Use this form to request a new common or unique course. Consult the system course database through for information about existing courses before submitting this form.

SDSM&T
Institution

Mechanical Engineering
Division/Department

Institutional Approval Signature

Section 1. Course Title and Description
If the course contains a lecture and laboratory component, identify both the lecture and laboratory numbers (xxx and xxxL) and credit hours associated with each. Provide the complete description as you wish it to appear in the system course database, including pre-requisites, co-requisites, and registration restrictions.

Prefix & No. | Course Title | Credits
--- | --- | ---
ME 456 | Fundamentals of Automotive Engineering Laboratory | 1

NOTE: The Enrollment Services Center assigns the short, abbreviated course title that appears on transcripts. The short title is limited to 30 characters (including spaces); meaningful but concise titles are encouraged due to space limitations in the student information system.

Course Description
Labaratory to accompany ME 456

NOTE: Course descriptions are short, concise summaries that typically do not exceed 75 words. DO: Address the content of the course and write descriptions using active verbs (e.g., explore, learn, develop, etc.). DO NOT: Repeat the title of the course, layout the syllabus, use pronouns such as “we” and “you,” or rely on specialized jargon, vague phrases, or clichés.

Pre-requisites or Co-requisites (add lines as needed)

Prefix & No. | Course Title | Pre-Req/Co-Req?
--- | --- | ---
ME 456 | Fundamentals of Automotive Engineering | co - req

Registration Restrictions

Section 2. Review of Course
2.1. Will this be a unique or common course (place an “X” in the appropriate box)?

☑ Unique Course

If the request is for a unique course, institutions must review the common course catalog in the system course database to determine if a comparable common course already exists. List the two closest course matches in the common course catalog and provide a brief narrative explaining why the proposed course differs from those listed. If a search of the common course catalog determines an existing common course exists, complete the Authority to Offer an Existing Course Form. Courses requested without an attempt to find comparable courses will not be reviewed.

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<tr>
<td>ME 412</td>
<td>Internal Combustion Engines</td>
<td>3</td>
</tr>
</tbody>
</table>

Provide explanation of differences between proposed course and existing system catalog courses below:

Although there would be some overlap with these listed courses, the majority of the content would be significantly different and the emphasis would have an entirely different focus.

ME 455 Vehicle Dynamics has primary focus regarding handling issues, suspension basics, and vehicle performance characteristics. These topics would be covered in the proposed new course, but would be a minor portion of the new course.

ME 412 Internal Combustion Engines has its complete emphasis based around the power source of the past 100 + years. This topic would be a key component of the new course, but the new course would also have a significant segment covering both hybrid and electric vehicle systems as well as other potential fuels for use in conventional engines.

☐ Common Course     Indicate universities that are proposing this common course:

☐ BHSU ☐ DSU ☐ NSU ☐ SDSMT ☐ SDSU ☐ USD

Section 3. Other Course Information

3.1. Are there instructional staffing impacts?

☐ No. Replacement of

(course prefix, course number, name of course, credits)

*Attach course deletion form

Effective date of deletion: Click here to enter a date.

☑ No. Schedule Management, explain below:

Ardell Knudson, Instructor in Mechanical Engineering, has taught this course as a special topics. That will be worked into his regular course rotation.

☐ Yes. Specify below:

3.2. Existing program(s) in which course will be offered (i.e., any current or pending majors, minors, certificates, etc.): Senior elective for BSME degree
3.3. Proposed instructional method by university (as defined by AAC Guideline 5.4): course will consist of lecture, projects, input from various outside contributors, some shop tours, and possible museum visits.

L Laboratory – for ME 456L

3.4. Proposed delivery method by university (as defined by AAC Guideline 5.5): 001 Face-to-face Term Based Instruction

3.5. Term change will be effective: Fall 2022

3.6. Can students repeat the course for additional credit?

☐ Yes, total credit limit: __________ ☒ No

3.7. Will grade for this course be limited to S/U (pass/fail)?

☐ Yes ☒ No

3.8. Will section enrollment be capped?

☒ Yes, max per section: 25 ☐ No

3.9. Will this course equate (i.e., be considered the same course for degree completion) with any other unique or common courses in the common course system database?

☐ Yes ☒ No
If yes, indicate the course(s) to which the course will equate (add lines as needed):

<table>
<thead>
<tr>
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<th>Course Title</th>
</tr>
</thead>
</table>

3.10. Is this prefix approved for your university?

☒ Yes ☐ No
If no, provide a brief justification below:

Section 4. Department and Course Codes (Completed by University Academic Affairs)

4.1. University Department: ME

4.2. Banner Department Code: MMEC

4.3. Proposed CIP Code: 141901

Is this a new CIP code for the university? ☐ Yes ☒ No
SOUTH DAKOTA BOARD OF REGENTS
ACADEMIC AFFAIRS FORMS

New Course Request

Use this form to request a new common or unique course. Consult the system course database through for information about existing courses before submitting this form.

SDSM&T Mechanical Engineering

Institution Division/Department

Institutional Approval Signature Date

Section 1. Course Title and Description
If the course contains a lecture and laboratory component, identify both the lecture and laboratory numbers (xxx and xxxL) and credit hours associated with each. Provide the complete description as you wish it to appear in the system course database, including pre-requisites, co-requisites, and registration restrictions.

<table>
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<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 462/562</td>
<td>Introduction to Batteries and Energy Storage</td>
<td>3</td>
</tr>
</tbody>
</table>

NOTE: The Enrollment Services Center assigns the short, abbreviated course title that appears on transcripts. The short title is limited to 30 characters (including spaces); meaningful but concise titles are encouraged due to space limitations in the student information system.

Course Description

This course focuses on in-depth discussions of mechanical engineering aspects of battery history, battery thermodynamics, battery redox reactions, different types of batteries and their applications. Battery design principles are introduced with real-world examples. Impact of battery energy storage on renewable energies and environment are discussed.

Note: Students enrolled in ME 562 will be held to a higher standard than those enrolled in ME 462.

NOTE: Course descriptions are short, concise summaries that typically do not exceed 75 words. DO: Address the content of the course and write descriptions using active verbs (e.g., explore, learn, develop, etc.). DO NOT: Repeat the title of the course, layout the syllabus, use pronouns such as “we” and “you,” or rely on specialized jargon, vague phrases, or clichés.

Pre-requisites or Co-requisites (add lines as needed)

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Pre-Req/Co-Req?</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 112</td>
<td>General Chemistry</td>
<td>Pre-Req</td>
</tr>
<tr>
<td>PHYS 213</td>
<td>University Physics II</td>
<td>Pre-Req</td>
</tr>
<tr>
<td>ME 312</td>
<td>Thermodynamics II</td>
<td>Pre-Req/Co-Req</td>
</tr>
</tbody>
</table>

Registration Restrictions

AAC Form 1.5 – New Course Request
(Last Revised 09/2020)
Section 2. Review of Course

2.1. Will this be a unique or common course (place an “X” in the appropriate box)?

☒ Unique Course

If the request is for a unique course, institutions must review the common course catalog in the system course database to determine if a comparable common course already exists. List the two closest course matches in the common course catalog and provide a brief narrative explaining why the proposed course differs from those listed. If a search of the common course catalog determines an existing common course exists, complete the Authority to Offer an Existing Course Form. Courses requested without an attempt to find comparable courses will not be reviewed.

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<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MES 711</td>
<td>Adv Energy Generation/Storage</td>
<td>3</td>
</tr>
<tr>
<td>EE 536</td>
<td>Photovoltaic Systems Engr (SDSU)</td>
<td>3</td>
</tr>
</tbody>
</table>

Provide explanation of differences between proposed course and existing system catalog courses below:

MES 711 is a doctoral level course that teaches energy generation and energy storage covering different types of devices, besides batteries. EE 536 is a masters’ level course that mainly teaches solar cells. The proposed new course will focus on battery energy storage with in-depth discussions of battery history, battery thermodynamics, battery redox reactions, different types of batteries and battery applications. Unique to this new course are battery design principles with real-world examples and discussions of impact of battery energy storage on renewable energies and environment, which none of the existing courses teach.

☐ Common Course   Indicate universities that are proposing this common course:

☐ BHSU  ☐ DSU  ☐ NSU  ☐ SDSMT  ☐ SDSU  ☐ USD

Section 3. Other Course Information

3.1. Are there instructional staffing impacts?

☐ No. Replacement of _______________________

(course prefix, course number, name of course, credits)

*Attach course deletion form

Effective date of deletion: ________________

Click here to enter a date.

☒ No. Schedule Management, explain below:

Necessary faculty have already been hired to teach this course (Dr. Xing). This course has already been taught as a special topics course.
☐ Yes. Specify below:

3.2. Existing program(s) in which course will be offered (i.e., any current or pending majors, minors, certificates, etc.):
This is an elective course open to all students that meet the pre and co-reqs.

3.3. Proposed instructional method by university (as defined by AAC Guideline 5.4):
If requesting an instructional method that is exempt from the Section Size Guidelines, please provide a brief description of how the course is appropriate for the instructional method, as defined in AAC Guidelines.
Lecture (R)

3.4. Proposed delivery method by university (as defined by AAC Guideline 5.5):
Face-to-face (001)

3.5. Term change will be effective:
Fall 2022

3.6. Can students repeat the course for additional credit?
☐ Yes, total credit limit: __________  ☒ No

3.7. Will grade for this course be limited to S/U (pass/fail)?
☐ Yes  ☒ No

3.8. Will section enrollment be capped?
☒ Yes, max per section: 25  ☐ No

3.9. Will this course equate (i.e., be considered the same course for degree completion) with any other unique or common courses in the common course system database?
☐ Yes  ☒ No
If yes, indicate the course(s) to which the course will equate (add lines as needed):

<table>
<thead>
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<th>Course Title</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>

3.10. Is this prefix approved for your university?
☒ Yes  ☐ No
If no, provide a brief justification below:

Section 4. Department and Course Codes (Completed by University Academic Affairs)

4.1. University Department: ME
4.2. Banner Department Code: MME

4.3. Proposed CIP Code: 141901

Is this a new CIP code for the university? ☐ Yes ☐ No

NEW COURSE REQUEST
Supporting Justification for On-Campus Review

Weibing Xing 2/28/2022
Request Originator Signature Date

Pierre Larochelle  
Department Chair Signature Date

School/College Dean Signature Date

1. Provide specific reasons for the proposal of this course and explain how the changes enhance the curriculum.
This new course will provide an opportunity for students with multiple engineering and science disciplines to learn fundamentals of battery energy storage. Unique to this new course are (1) Battery design principles with real-world examples and (2) Discussions of impact of battery energy storage on renewable energies and environment, which none of the existing courses teach. The new course will prepare students to become next-generation engineers and scientists in the field of battery energy storage.

2. Note whether this course is: ☐ Required ☒ Elective

3. In addition to the major/program in which this course is offered, what other majors/programs will be affected by this course?
None

4. If this will be a dual listed course, indicate how the distinction between the two levels will be made.
Students registering for the 500 level version will be held to a higher standard and will be required to do additional work.

5. Desired section size 25

6. Provide qualifications of faculty who will teach this course. List name(s), rank(s), and degree(s).

Weibing Xing, Associate Professor, PhD.
Dr. Xing joined the Department of Mechanical Engineering, South Dakota Mines as a Pearson Endowed Chair, Associate Professor in 2020. He has since taught new courses in batteries and
electrochemical energy storage at both undergraduate and graduate levels, which will be offered again in the future. He is currently leading the research activities of the Energy Storage Lab at the Mechanical Engineering to tackle challenges in the current-generation and to foster innovations for next-generation electrochemical energy storage devices and systems. Prior to SD Mines, Dr. Xing was working at several battery companies leading a number of federal funded energy storage programs as a principal investigator for materials research, device integration and product development. Dr. Xing was a postdoctoral research fellow at Simon Fraser University and Dalhousie University where he developed high energy density materials for Li-ion batteries and a phenomenological model correlating materials’ physical properties with electrochemical performance. Dr. Xing has >40 scientific journal publications, >30 granted/pending patents and >30 presentations at scientific/technical conferences. Dr. Xing is a long-time member of The Electrochemical Society.

7. Note whether adequate facilities are available and list any special equipment needed for the course.
   Adequate facilities are available for this course.

8. Note whether adequate library and media support are available for the course.
   Adequate library and media support are available for the course.

9. Will the new course duplicate courses currently being offered on this campus?
   ☑ No
   If yes, provide justification.

10. If this course may be offered for variable credit, explain how the amount of credit at each offering is to be determined.
    N/A

11. Add any additional comments that will aid in the evaluation of this request.
Use this form to request a new common or unique course. Consult the system course database through for information about existing courses before submitting this form.

Section 1. Course Title and Description
If the course contains a lecture and laboratory component, identify both the lecture and laboratory numbers (xxx and xxxL) and credit hours associated with each. Provide the complete description as you wish it to appear in the system course database, including pre-requisites, co-requisites, and registration restrictions.

Prefix & No.  
Course Title  
Credits
ME 466/566  
Aerospace Structures  
3

Note: The Enrollment Services Center assigns the short, abbreviated course title that appears on transcripts. The short title is limited to 30 characters (including spaces); meaningful but concise titles are encouraged due to space limitations in the student information system.

Course Description
This course presents techniques for the structural analysis of thin-walled structures as encountered in air- and spacecraft structures. Topics include modeling and idealization methods of aerospace structures for the prediction and analysis of stress and strain distributions due to torsion, bending, and transverse shear loading; elastic buckling of thin-walled structures; as well as the mechanics of composite laminates.

Note: Students enrolled in ME 566 will be held to a higher standard than those enrolled in ME 466.

Pre-requisites or Co-requisites (add lines as needed)

Prefix & No.  
Course Title  
Pre-Req/Co-Req?
ME 316  
Solid Mechanics  
Pre-Req
Section 2. Review of Course

2.1. **Will this be a unique or common course (place an “X” in the appropriate box)?**

☑ **Unique Course**

*If the request is for a unique course, institutions must review the common course catalog in the system course database to determine if a comparable common course already exists. List the two closest course matches in the common course catalog and provide a brief narrative explaining why the proposed course differs from those listed. If a search of the common course catalog determines an existing common course exists, complete the Authority to Offer an Existing Course Form. Courses requested without an attempt to find comparable courses will not be reviewed.*

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</thead>
<tbody>
<tr>
<td>ME/MET443</td>
<td>Composite Materials</td>
<td>3</td>
</tr>
<tr>
<td>ME 715</td>
<td>Advanced Composite Materials</td>
<td>3</td>
</tr>
</tbody>
</table>

*Provide explanation of differences between proposed course and existing system catalog courses below:*

The Aerospace Structures content is unique in that it expands on content from ME 316 in the application for thin-walled aerospace structures along with the analysis of composite laminates. The ME/MET 443 course in composite materials focuses on the materials aspects primarily and little on the mechanics aspect. Then at the graduate level, the ME 715 advanced composite materials course focuses primarily on the mechanics, but with little application to aerospace structures. Courses in the ME and CEE programs were reviewed at South Dakota Mines and SDSU and there was also nothing similar to an Aerospace Structures course.

☐ **Common Course**

*Indicate universities that are proposing this common course:*

☐ BHSU ☐ DSU ☐ NSU ☐ SDSMT ☐ SDSU ☐ USD

Section 3. Other Course Information

3.1. **Are there instructional staffing impacts?**

☐ **No.** Replacement of

(course prefix, course number, name of course, credits)

*Attach course deletion form*

Effective date of deletion: [Click here to enter a date.]

☑ **No.** Schedule Management, explain below:

Dr. Albert Romkes, Associate Professor in Mechanical Engineering earned his Ph.D. in Aerospace Engineering and is teaching this as a topics course in Spring 2022. That will be worked into his regular course rotation.
☐ Yes. Specify below:

3.2. Existing program(s) in which course will be offered (i.e., any current or pending majors, minors, certificates, etc.): minor in Aerospace Engineering

3.3. Proposed instructional method by university (as defined by AAC Guideline 5.4):

R Lecture

If requesting an instructional method that is exempt from the Section Size Guidelines, please provide a brief description of how the course is appropriate for the instructional method, as defined in AAC Guidelines.

3.4. Proposed delivery method by university (as defined by AAC Guideline 5.5):

001 Face-to-face Term Based Instruction

3.5. Term change will be effective: Fall 2022

3.6. Can students repeat the course for additional credit?

☐ Yes, total credit limit: __________ ☒ No

3.7. Will grade for this course be limited to S/U (pass/fail)?

☐ Yes ☒ No

3.8. Will section enrollment be capped?

☒ Yes, max per section: 25 ☐ No

3.9. Will this course equate (i.e., be considered the same course for degree completion) with any other unique or common courses in the common course system database?

☐ Yes ☒ No

If yes, indicate the course(s) to which the course will equate (add lines as needed):

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<th>Course Title</th>
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</table>

3.10. Is this prefix approved for your university?

☒ Yes ☐ No

If no, provide a brief justification below:

Section 4. Department and Course Codes (Completed by University Academic Affairs)

4.1. University Department: ME
4.2. Banner Department Code: MME

4.3. Proposed CIP Code: 14.0201

Is this a new CIP code for the university? ☐ Yes ☒ No
Use this form to request a new common or unique course. Consult the system course database through for information about existing courses before submitting this form.

**Section 1. Course Title and Description**

If the course contains a lecture and laboratory component, identify both the lecture and laboratory numbers (xxx and xxxL) and credit hours associated with each. Provide the complete description as you wish it to appear in the system course database, including pre-requisites, co-requisites, and registration restrictions.

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<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 466L/566L</td>
<td>Aerospace Structures Lab</td>
<td>1</td>
</tr>
</tbody>
</table>

*NOTE: The Enrollment Services Center assigns the short, abbreviated course title that appears on transcripts. The short title is limited to 30 characters (including spaces); meaningful but concise titles are encouraged due to space limitations in the student information system.*

**Course Description**

Design of riveted lap joints, as encountered in aerospace applications, and experimental analysis of the corresponding stress and strain distributions within the joints. Additional topics concern the theoretical prediction and experimental validation of the stability (i.e., buckling) of thin-walled structural elements.

Note: Students enrolled in ME 566L will be held to a higher standard than those enrolled in ME 466L.

*NOTE: Course descriptions are short, concise summaries that typically do not exceed 75 words. DO: Address the content of the course and write descriptions using active verbs (e.g., explore, learn, develop, etc.). DO NOT: Repeat the title of the course, layout the syllabus, use pronouns such as “we” and “you,” or rely on specialized jargon, vague phrases, or clichés.*

**Pre-requisites or Co-requisites (add lines as needed)**

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<tbody>
<tr>
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**Registration Restrictions**
Section 2. Review of Course

2.1. Will this be a unique or common course (*place an “X” in the appropriate box)?

☒ Unique Course

If the request is for a unique course, institutions must review the common course catalog in the system course database to determine if a comparable common course already exists. List the two closest course matches in the common course catalog and provide a brief narrative explaining why the proposed course differs from those listed. If a search of the common course catalog determines an existing common course exists, complete the Authority to Offer an Existing Course Form. Courses requested without an attempt to find comparable courses will not be reviewed.

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</thead>
<tbody>
<tr>
<td>ME/MET443</td>
<td>Composite Materials</td>
<td>3</td>
</tr>
<tr>
<td>ME 715</td>
<td>Advanced Composite Materials</td>
<td>3</td>
</tr>
</tbody>
</table>

Provide explanation of differences between proposed course and existing system catalog courses below:

The Aerospace Structures lab content is unique in that it expands on content from ME 316 in the application for thin-walled aerospace structures along with the analysis of composite laminates. The ME/MET 443 course in composite materials focuses on the materials aspects primarily and little on the mechanics aspect. Then at the graduate level, the ME 715 advanced composite materials course focuses primarily on the mechanics, but with little application to aerospace structures. Courses in the ME and CEE programs were reviewed at South Dakota Mines and SDSU and there was also nothing similar to an Aerospace Structures course.

☐ Common Course  Indicate universities that are proposing this common course:

☐ BHSU  ☐ DSU  ☐ NSU  ☐ SDSMT  ☐ SDSU  ☐ USD

Section 3. Other Course Information

3.1. Are there instructional staffing impacts?

☐ No. Replacement of ________________________________

*Attach course deletion form

Effective date of deletion:   Click here to enter a date.

☒ No. Schedule Management, explain below:

Dr. Albert Romkes, Associate Professor in Mechanical Engineering earned his Ph.D. in Aerospace Engineering and is teaching this as a topics course in Spring 2022. That will be worked into his regular course rotation.

☐ Yes. Specify below:
3.2. Existing program(s) in which course will be offered (i.e., any current or pending majors, minors, certificates, etc.): minor in Aerospace Engineering

3.3. Proposed instructional method by university (as defined by AAC Guideline 5.4):

If requesting an instructional method that is exempt from the Section Size Guidelines, please provide a brief description of how the course is appropriate for the instructional method, as defined in AAC Guidelines.

L Laboratory

3.4. Proposed delivery method by university (as defined by AAC Guideline 5.5):

001 Face-to-face Term Based Instruction

3.5. Term change will be effective: Fall 2022

3.6. Can students repeat the course for additional credit?

☐ Yes, total credit limit: __________  ☒ No

3.7. Will grade for this course be limited to S/U (pass/fail)?

☐ Yes  ☒ No

3.8. Will section enrollment be capped?

☒ Yes, max per section: 25  ☐ No

3.9. Will this course equate (i.e., be considered the same course for degree completion) with any other unique or common courses in the common course system database?

☐ Yes  ☒ No

If yes, indicate the course(s) to which the course will equate (add lines as needed):

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3.10. Is this prefix approved for your university?

☒ Yes  ☐ No

If no, provide a brief justification below:


Section 4. Department and Course Codes (Completed by University Academic Affairs)

4.1. University Department: ME
4.2. Banner Department Code: MME

4.3. Proposed CIP Code: 14.0201

Is this a new CIP code for the university? ☐ Yes ☒ No
SOUTH DAKOTA BOARD OF REGENTS
ACADEMIC AFFAIRS FORMS

New Course Request

Use this form to request a new common or unique course. Consult the system course database through for information about existing courses before submitting this form.

SDSM&T  Mechanical Engineering
Institution  Division/Department

Institutional Approval Signature  Date

Section 1. Course Title and Description
If the course contains a lecture and laboratory component, identify both the lecture and laboratory numbers (xxx and xxxL) and credit hours associated with each. Provide the complete description as you wish it to appear in the system course database, including pre-requisites, co-requisites, and registration restrictions.

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 467/567</td>
<td>Rockets and Mission Analysis</td>
<td>3</td>
</tr>
</tbody>
</table>

NOTE: The Enrollment Services Center assigns the short, abbreviated course title that appears on transcripts. The short title is limited to 30 characters (including spaces); meaningful but concise titles are encouraged due to space limitations in the student information system.

Course Description
This course offers an introduction to space mission analysis and design. It covers mission definition, characterization, and evaluation, along with identification of mission requirements. Fundamentals of space geometry, astrodynamics, orbit design, space environment, propulsion and launch systems are reviewed. An assessment of manufacturability, reliability, cost, and design limits for space systems will be offered. Additional topics may include payload sizing, spacecraft design, communications, operations, and ground systems.

Note: Students enrolled in ME 567 will be held to a higher standard than those enrolled in ME 467.

NOTE: Course descriptions are short, concise summaries that typically do not exceed 75 words. DO: Address the content of the course and write descriptions using active verbs (e.g., explore, learn, develop, etc.). DO NOT: Repeat the title of the course, layout the syllabus, use pronouns such as “we” and “you,” or rely on specialized jargon, vague phrases, or clichés.

Pre-requisites or Co-requisites (add lines as needed)

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Pre-Req/Co-Req?</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 331</td>
<td>Thermo Fluid Dynamics</td>
<td>Pre-Req</td>
</tr>
</tbody>
</table>

Registration Restrictions
Section 2. Review of Course

2.1. Will this be a unique or common course (place an “X” in the appropriate box)?

☑ Unique Course
If the request is for a unique course, institutions must review the common course catalog in the system course database to determine if a comparable common course already exists. List the two closest course matches in the common course catalog and provide a brief narrative explaining why the proposed course differs from those listed. If a search of the common course catalog determines an existing common course exists, complete the Authority to Offer an Existing Course Form. Courses requested without an attempt to find comparable courses will not be reviewed.

<table>
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<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 321</td>
<td>The Physics &amp; Implications of Space Travel</td>
<td>3</td>
</tr>
<tr>
<td>ME 457/557</td>
<td>Intermediate Dynamics</td>
<td>3</td>
</tr>
</tbody>
</table>

Provide explanation of differences between proposed course and existing system catalog courses below:

The Physics 321 course focuses more on the human element of long-term space travel beyond Earth’s orbit. There does not appear to be much content on the technical aspects of rocket and mission analysis. Additionally, the ME 457/557 has a focus on dynamics in general and not the overall considerations for rocket and mission analysis. Courses in ME, PHYS, CBE, and CEE programs were reviewed at South Dakota Mines and SDSU and there was nothing similar to a Rockets and Mission Analysis course.

☐ Common Course   Indicate universities that are proposing this common course:

☐ BHSU    ☐ DSU    ☐ NSU    ☐ SDSMT    ☐ SDSU    ☐ USD

Section 3. Other Course Information

3.1. Are there instructional staffing impacts?

☐ No. Replacement of

(course prefix, course number, name of course, credits)

*Attach course deletion form

Effective date of deletion:  Click here to enter a date.

☐ No. Schedule Management, explain below:

☒ Yes. Specify below:

New hire of a Professor Practice is in process for an August 2022 start date.
3.2. Existing program(s) in which course will be offered (i.e., any current or pending majors, minors, certificates, etc.): minor in Aerospace Engineering

3.3. Proposed instructional method by university (as defined by AAC Guideline 5.4):
If requesting an instructional method that is exempt from the Section Size Guidelines, please provide a brief description of how the course is appropriate for the instructional method, as defined in AAC Guidelines.

R Lecture

3.4. Proposed delivery method by university (as defined by AAC Guideline 5.5):

001 Face-to-face Term Based Instruction

3.5. Term change will be effective: Fall 2022

3.6. Can students repeat the course for additional credit?
☐ Yes, total credit limit: __________  ☒ No

3.7. Will grade for this course be limited to S/U (pass/fail)?
☐ Yes  ☒ No

3.8. Will section enrollment be capped?
☒ Yes, max per section: 25  ☐ No

3.9. Will this course equate (i.e., be considered the same course for degree completion) with any other unique or common courses in the common course system database?
☐ Yes  ☒ No
If yes, indicate the course(s) to which the course will equate (add lines as needed):

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</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3.10. Is this prefix approved for your university?
☒ Yes  ☐ No
If no, provide a brief justification below:

Section 4. Department and Course Codes (Completed by University Academic Affairs)

4.1. University Department: ME

4.2. Banner Department Code: MME
4.3. Proposed CIP Code: 14.0201

Is this a new CIP code for the university?  □ Yes  ☒ No
Ash, Jason T.

From: Schnee, Richard W.
Sent: Tuesday, March 1, 2022 1:09 PM
To: Ash, Jason T.
Cc: Larochelle, Pierre M.
Subject: Re: Rockets and Mission Analysis (New Course Request Approval)

Dear Jason,

We in Physics agree that ME 467/567 is significantly different from PHYS 321, and we support your creating this new course, which we think will serve students in the Aerospace Minor much better than PHYS 321 would. Due to the lack of prerequisites, PHYS 321 covers just the basics of space travel along with philosophical discussion on the topics.

Cheers,
Richard Schnee
Professor and Head
Physics Department
South Dakota Mines
Rapid City, SD 57701-3995
Office: 101 Dakota Building
Phone: 605-394-5206
email: richard.schnee@sdsmt.edu

From: "Ash, Jason T." <Jason.Ash@sdsmt.edu>
Subject: Rockets and Mission Analysis (New Course Request Approval)
Date: February 28, 2022 at 10:08:01 AM MST
To: "Schnee, Richard W." <Richard.Schnee@sdsmt.edu>
Cc: "Larochelle, Pierre M." <Pierre.Larochelle@sdsmt.edu>

Good morning Dr. Schnee:

We are proposing a new course ME 467/567: Rockets and Mission Analysis in support of our Aerospace Minor. I was struggling to find anything similar and the Phys 321: The Physics & Implications of Space Travel was the only other one that I could find that was remotely related. In comparing the two course descriptions, I believe the ME 467/567 is unique enough then to be approved by the SD BOR. Would you review and reply back if you support this new course request?

This needs to be submitted to CGE by this Friday March 4th, so would you be able to respond by Wednesday this week?

Thank you,
Jason

------------------

Jason Ash, Ph.D.
Associate Professor of Mechanical Engineering
South Dakota School of Mines & Technology
New Course Request

Use this form to request a new common or unique course. Consult the system course database through for information about existing courses before submitting this form.

SDSM&T
Institution

Mechanical Engineering
Division/Department

Institutional Approval Signature

Section 1. Course Title and Description
If the course contains a lecture and laboratory component, identify both the lecture and laboratory numbers (xxx and xxxL) and credit hours associated with each. Provide the complete description as you wish it to appear in the system course database, including pre-requisites, co-requisites, and registration restrictions.

<table>
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<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 468/568</td>
<td>Rockets and Propulsion</td>
<td>3</td>
</tr>
</tbody>
</table>

NOTE: The Enrollment Services Center assigns the short, abbreviated course title that appears on transcripts. The short title is limited to 30 characters (including spaces); meaningful but concise titles are encouraged due to space limitations in the student information system.

Course Description
This course offers an overview of rocket propulsion systems. It covers the scientific principles behind rocket propulsion and vehicle performance. Different types of rocket propulsion are reviewed such as chemical propulsion including both solid propellant and liquid propellant rocket propulsion and electric propulsion. Additional topics may include engine systems, thrust vector control, rocket exhaust considerations, and rocket testing.

Note: Students enrolled in ME 568 will be held to a higher standard than those enrolled in ME 468.

NOTE: Course descriptions are short, concise summaries that typically do not exceed 75 words. DO: Address the content of the course and write descriptions using active verbs (e.g., explore, learn, develop, etc.). DO NOT: Repeat the title of the course, layout the syllabus, use pronouns such as “we” and “you,” or rely on specialized jargon, vague phrases, or clichés.

Pre-requisites or Co-requisites (add lines as needed)

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<th>Pre-Req/Co-Req?</th>
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</thead>
<tbody>
<tr>
<td>ME 331</td>
<td>Thermo Fluid Dynamics</td>
<td>Pre-Req</td>
</tr>
</tbody>
</table>

Registration Restrictions
Section 2. Review of Course

2.1. Will this be a unique or common course (place an “X” in the appropriate box)?

☒ Unique Course

*If the request is for a unique course, institutions must review the common course catalog in the system course database to determine if a comparable common course already exists. List the two closest course matches in the common course catalog and provide a brief narrative explaining why the proposed course differs from those listed. If a search of the common course catalog determines an existing common course exists, complete the Authority to Offer an Existing Course Form. Courses requested without an attempt to find comparable courses will not be reviewed.*

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<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 402/502</td>
<td>Gas Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>ME 460</td>
<td>Fuels and Combustion</td>
<td>3</td>
</tr>
</tbody>
</table>

Provide explanation of differences between proposed course and existing system catalog courses below:

The Rockets and Propulsion course will be unique in comparison to other existing courses. ME 402/502 focuses on compressible flow in general whereas this course will focus on rocket propulsion, thrust vector control, and rocket exhaust. The ME 460 course focuses more on fuels and combustion for automotive applications. Courses in ME, PHYS, CBE, and CEE programs were reviewed at South Dakota Mines and SDSU and there was nothing similar to a Rockets and Propulsion course.

☐ Common Course

Indicate universities that are proposing this common course:

☐ BHSU  ☐ DSU  ☐ NSU  ☐ SDSMT  ☐ SDSU  ☐ USD

Section 3. Other Course Information

3.1. Are there instructional staffing impacts?

☐ No. Replacement of

(course prefix, course number, name of course, credits)

*Attach course deletion form

Effective date of deletion: Click here to enter a date.

☐ No. Schedule Management, explain below:

☒ Yes. Specify below:

New hire of a Professor Practice is in process for an August 2022 start date.
3.2. Existing program(s) in which course will be offered (i.e., any current or pending majors, minors, certificates, etc.): minor in Aerospace Engineering

3.3. Proposed instructional method by university (as defined by AAC Guideline 5.4):
If requesting an instructional method that is exempt from the Section Size Guidelines, please provide a brief description of how the course is appropriate for the instructional method, as defined in AAC Guidelines.

R Lecture

3.4. Proposed delivery method by university (as defined by AAC Guideline 5.5):

001 Face-to-face Term Based Instruction

3.5. Term change will be effective: Fall 2022

3.6. Can students repeat the course for additional credit?

☐ Yes, total credit limit: ________ ☒ No

3.7. Will grade for this course be limited to S/U (pass/fail)?

☐ Yes ☒ No

3.8. Will section enrollment be capped?

☐ Yes, max per section: 25 ☒ No

3.9. Will this course equate (i.e., be considered the same course for degree completion) with any other unique or common courses in the common course system database?

☐ Yes ☒ No

If yes, indicate the course(s) to which the course will equate (add lines as needed):

<table>
<thead>
<tr>
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<th>Course Title</th>
</tr>
</thead>
</table>

3.10. Is this prefix approved for your university?

☒ Yes ☐ No

If no, provide a brief justification below:

Section 4. Department and Course Codes (Completed by University Academic Affairs)

4.1. University Department: ME

4.2. Banner Department Code: MME

4.3. Proposed CIP Code: 14.0201
New Course Request

Use this form to request a new common or unique course. Consult the system course database through for information about existing courses before submitting this form.

SDSM&T
Institution

Mechanical Engineering
Division/Department

Institutional Approval Signature

Section 1. Course Title and Description
If the course contains a lecture and laboratory component, identify both the lecture and laboratory numbers (xxx and xxxL) and credit hours associated with each. Provide the complete description as you wish it to appear in the system course database, including pre-requisites, co-requisites, and registration restrictions.

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<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 469/569</td>
<td>Aircraft Stability and Control</td>
<td>3</td>
</tr>
</tbody>
</table>

NOTE: The Enrollment Services Center assigns the short, abbreviated course title that appears on transcripts. The short title is limited to 30 characters (including spaces); meaningful but concise titles are encouraged due to space limitations in the student information system.

Course Description
This course is designed to understand stability and control aspects of an airplane. Topics covered include fundamental of aeronautics, static equilibrium and trim, airplane equation of motion, longitudinal & lateral/directional dynamics, open loop control and response to the controls and atmospheric disturbances, and command and stability augmentation.

Note: Students enrolled in ME 569 will be held to a higher standard than those enrolled in ME 469.

NOTE: Course descriptions are short, concise summaries that typically do not exceed 75 words. DO: Address the content of the course and write descriptions using active verbs (e.g., explore, learn, develop, etc.). DO NOT: Repeat the title of the course, layout the syllabus, use pronouns such as “we” and “you,” or rely on specialized jargon, vague phrases, or clichés.

Pre-requisites or Co-requisites (add lines as needed)

<table>
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<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Pre-Req/Co-Req?</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 352</td>
<td>Introduction to Dynamic Systems</td>
<td>Pre-Req</td>
</tr>
</tbody>
</table>

Registration Restrictions
Section 2. Review of Course

2.1. Will this be a unique or common course (place an “X” in the appropriate box)?

☒ Unique Course

If the request is for a unique course, institutions must review the common course catalog in the system course database to determine if a comparable common course already exists. List the two closest course matches in the common course catalog and provide a brief narrative explaining why the proposed course differs from those listed. If a search of the common course catalog determines an existing common course exists, complete the Authority to Offer an Existing Course Form. Courses requested without an attempt to find comparable courses will not be reviewed.

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</thead>
<tbody>
<tr>
<td>ME 402/502</td>
<td>Gas Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>ME 431/531</td>
<td>Aerodynamics (SDSU)</td>
<td>3</td>
</tr>
</tbody>
</table>

Provide explanation of differences between proposed course and existing system catalog courses below:

Aircraft Stability and Control will be a unique course that focuses on both the aerodynamics and control of an entire aircraft. The most closely related courses are ME 402/502 which looks at gas dynamics in general. Then ME 431/531 focuses on aerodynamics of airfoils. Courses in ME, PHYS, CBE, and CEE programs were reviewed at South Dakota Mines and SDSU and these were the only closely related course offerings.

☐ Common Course

Indicate universities that are proposing this common course:

☐ BHSU ☐ DSU ☐ NSU ☐ SDSMT ☐ SDSU ☐ USD

Section 3. Other Course Information

3.1. Are there instructional staffing impacts?

☐ No. Replacement of

(course prefix, course number, name of course, credits)

*Attach course deletion form

Effective date of deletion: Click here to enter a date.

☐ No. Schedule Management, explain below:

☒ Yes. Specify below:

New hire of a Professor Practice is in process for an August 2022 start date.

3.2. Existing program(s) in which course will be offered (i.e., any current or pending majors, minors, certificates, etc.): minor in Aerospace Engineering
3.3. **Proposed instructional method by university** *(as defined by AAC Guideline 5.4)*:

*If requesting an instructional method that is exempt from the Section Size Guidelines, please provide a brief description of how the course is appropriate for the instructional method, as defined in AAC Guidelines.*

R Lecture

3.4. **Proposed delivery method by university** *(as defined by AAC Guideline 5.5)*:

001 Face-to-face Term Based Instruction

3.5. **Term change will be effective**: Fall 2022

3.6. **Can students repeat the course for additional credit?**

☐ Yes, total credit limit: __________  ☒ No

3.7. **Will grade for this course be limited to S/U (pass/fail)?**

☐ Yes  ☒ No

3.8. **Will section enrollment be capped?**

☒ Yes, max per section: 25  ☐ No

3.9. **Will this course equate (i.e., be considered the same course for degree completion) with any other unique or common courses in the common course system database?**

☐ Yes  ☒ No

*If yes, indicate the course(s) to which the course will equate (add lines as needed):*

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
</tr>
</thead>
</table>

3.10. **Is this prefix approved for your university?**

☒ Yes  ☐ No

*If no, provide a brief justification below:*

Section 4. **Department and Course Codes (Completed by University Academic Affairs)**

4.1. **University Department**: ME

4.2. **Banner Department Code**: MME

4.3. **Proposed CIP Code**: 14.0201

*Is this a new CIP code for the university?*  ☐ Yes  ☒ No
| From: | Liu, Yucheng <Yucheng.Liu@sdsstate.edu> |
| Sent: | Friday, February 25, 2022 3:00 PM |
| To: | Ash, Jason T. |
| Cc: | Larochelle, Pierre M. |
| Subject: | [EXT] RE: Aircraft Stability and Control (New Course Request Approval) |

*** This email is from an EXTERNAL sender. Use CAUTION before opening attachments or clicking links.***

Dear Dr. Ash,

Having compared your new course with the existing courses in the ME program at South Dakota State University, I don’t see this course overlaps with any of our existing courses. I herewith support your request of adding the course “Aircraft Stability and Control”. Please let me know if I can be of any other assistance.

Best Regards,

Yucheng

Yucheng Liu, PhD, PE
Department Head and Duane Sander Professor
ASME Fellow, SAE Fellow
Mechanical Engineering Department
Jerome J. Lohr College of Engineering
South Dakota State University

Crothers Engineering Hall 221, Box 2219
Brookings, SD 57007
Telephone: (605)688-5426; Fax: (605)688-5878
Email: yucheng.liu@sdsstate.edu

---

| From: | Ash, Jason T. <Jason.Ash@sdsmt.edu> |
| Sent: | Friday, February 25, 2022 3:18 PM |
| To: | Liu, Yucheng <Yucheng.Liu@sdsstate.edu> |
| Cc: | Larochelle, Pierre M. <pierre.larochelle@sdsmt.edu> |
| Subject: | Aircraft Stability and Control (New Course Request Approval) |

Hello Dr. Liu:

I serve on the University Curriculum Committee for the ME program here at South Dakota School of Mines & Technology. We have a new course offering that was delivered as a ME 492/592 Special Topics course in Fall 2021 that we would like to get added as a new course in support of our Aerospace Minor. We felt this was sufficiently different than Gas Dynamics and the Aerodynamics course offered at SDSU. Would you review and reply back with your approval of our new course request? The UCC likes these approvals included with the submission of the new course request. I’ll have another one to send your way early next week. The due date for submission is March 4th, so hoping to have back by the middle of next week.
Thank you,
Jason

---------------------------------------------
Jason Ash, Ph.D.
Associate Professor of Mechanical Engineering
South Dakota School of Mines & Technology
501 East Saint Joseph St.
Rapid City, SD 57701
Office: CM128B
Phone: 605-355-3736
Email: Jason.Ash@sdsmte.edu
Use this form to request a new common or unique course. Consult the system course database through for information about existing courses before submitting this form.

**SDSM&T**

**Institution**

**Mechanical Engineering**

**Division/Department**

Institutional Approval Signature

Date

---

### Section 1. Course Title and Description

If the course contains a lecture and laboratory component, identify both the lecture and laboratory numbers (xxx and xxxL) and credit hours associated with each. Provide the complete description as you wish it to appear in the system course database, including pre-requisites, co-requisites, and registration restrictions.

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<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 662</td>
<td>Energy Storage Devices</td>
<td>3</td>
</tr>
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</table>

*NOTE: The Enrollment Services Center assigns the short, abbreviated course title that appears on transcripts. The short title is limited to 30 characters (including spaces); meaningful but concise titles are encouraged due to space limitations in the student information system.*

**Course Description**

This course begins with a review of mechanical engineering aspects of battery fundamentals, followed by discussions of current and future research and development directions of lithium-ion batteries. Next-generation, beyond lithium-ion battery chemistries, such as lithium-sulfur batteries, Na-ion batteries, are introduced. The course topics expand to other forms of electrochemical energy storage devices, such as supercapacitors. Electrochemical impedance spectroscopy is introduced and classroom demonstration is conducted.

*NOTE: Course descriptions are short, concise summaries that typically do not exceed 75 words. DO: Address the content of the course and write descriptions using active verbs (e.g., explore, learn, develop, etc.). DO NOT: Repeat the title of the course, layout the syllabus, use pronouns such as “we” and “you,” or rely on specialized jargon, vague phrases, or clichés.*

**Pre-requisites or Co-requisites (add lines as needed)**

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**Registration Restrictions**
Section 2. Review of Course

2.1. Will this be a unique or common course (place an “X” in the appropriate box)?

☐ Unique Course

If the request is for a unique course, institutions must review the common course catalog in the system course database to determine if a comparable common course already exists. List the two closest course matches in the common course catalog and provide a brief narrative explaining why the proposed course differs from those listed. If a search of the common course catalog determines an existing common course exists, complete the Authority to Offer an Existing Course Form. Courses requested without an attempt to find comparable courses will not be reviewed.

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<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MES 711</td>
<td>Adv Energy Generation/Storage</td>
<td>3</td>
</tr>
<tr>
<td>EE 536</td>
<td>Photovoltaic Systems Engr (SDSU)</td>
<td>3</td>
</tr>
</tbody>
</table>

Provide explanation of differences between proposed course and existing system catalog courses below:

MES 711 is a doctoral level course that teaches energy generation and energy storage covering different types of devices including biological/microbial fuel cells. EE 536 is a master’s level course that mainly teaches solar cells. The proposed new course ME 662 is an advanced course to ME 462/562, with in-depth discussions of current and future research and development directions of Li-ion batteries, next-generation (beyond Li-ion) battery chemistries, such as lithium-sulfur batteries, Na-ion batteries. Unique to this new course is introduction to Electrochemical Impedance Spectroscopy (EIS), an important and useful analytical technique for batteries and many other applications with a live demonstration of EIS measurement in classroom to help student learning, which none of the existing courses teach.

☐ Common Course

Indicate universities that are proposing this common course:

☐ BHSU  ☐ DSU  ☐ NSU  ☐ SDSMT  ☐ SDSU  ☐ USD

Section 3. Other Course Information

3.1. Are there instructional staffing impacts?

☐ No. Replacement of ____________________________________________________________________________

*Attach course deletion form

Effective date of deletion: ________________________________________________________________________

☐ No. Schedule Management, explain below:

Necessary faculty have already been hired to teach this course (Dr. Xing). This course has already been taught as a special topics course

☐ Yes. Specify below:
3.2. Existing program(s) in which course will be offered (i.e., any current or pending majors, minors, certificates, etc.):
This is an elective course open to all students that meet the pre-reqs.

3.3. Proposed instructional method by university (as defined by AAC Guideline 5.4):
If requesting an instructional method that is exempt from the Section Size Guidelines, please provide a brief description of how the course is appropriate for the instructional method, as defined in AAC Guidelines.
Lecture (R)

3.4. Proposed delivery method by university (as defined by AAC Guideline 5.5):
Face-to-face (001)

3.5. Term change will be effective:
Fall 2022

3.6. Can students repeat the course for additional credit?
☐ Yes, total credit limit: __________ ☒ No

3.7. Will grade for this course be limited to S/U (pass/fail)?
☐ Yes ☒ No

3.8. Will section enrollment be capped?
☒ Yes, max per section: 25 ☐ No

3.9. Will this course equate (i.e., be considered the same course for degree completion) with any other unique or common courses in the common course system database?
☐ Yes ☒ No
If yes, indicate the course(s) to which the course will equate (add lines as needed):

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
</tr>
</thead>
</table>

3.10. Is this prefix approved for your university?
☒ Yes ☐ No
If no, provide a brief justification below:

Section 4. Department and Course Codes (Completed by University Academic Affairs)

4.1. University Department: ME

4.2. Banner Department Code: MME

4.3. Proposed CIP Code: 141901
Is this a new CIP code for the university? ☒ No
Use this form to request a new common or unique course. Consult the system course database through for information about existing courses before submitting this form.

SDSM&T  
Institution  

Mechanical Engineering  
Division/Department  

Institutional Approval Signature  
Date  

Section 1. Course Title and Description  
If the course contains a lecture and laboratory component, identify both the lecture and laboratory numbers (xxx and xxxL) and credit hours associated with each. Provide the complete description as you wish it to appear in the system course database, including pre-requisites, co-requisites, and registration restrictions.

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 681</td>
<td>Reliability in Mechanical Systems</td>
<td>3</td>
</tr>
</tbody>
</table>

NOTE: The Enrollment Services Center assigns the short, abbreviated course title that appears on transcripts. The short title is limited to 30 characters (including spaces); meaningful but concise titles are encouraged due to space limitations in the student information system.

Course Description
Advanced study of reliability engineering in relation to mechanical systems. Probability and statistical methods will be utilized to determine the reliability and/or probability of failure for mechanical systems.

NOTE: Course descriptions are short, concise summaries that typically do not exceed 75 words. DO: Address the content of the course and write descriptions using active verbs (e.g., explore, learn, develop, etc.). DO NOT: Repeat the title of the course, layout the syllabus, use pronouns such as “we” and “you,” or rely on specialized jargon, vague phrases, or clichés.

Pre-requisites or Co-requisites (add lines as needed)

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Pre-Req/Co-Req?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Registration Restrictions

Section 2. Review of Course
2.1. **Will this be a unique or common course (place an “X” in the appropriate box)?**

☑ **Unique Course**

*If the request is for a unique course, institutions must review the common course catalog in the system course database to determine if a comparable common course already exists. List the two closest course matches in the common course catalog and provide a brief narrative explaining why the proposed course differs from those listed. If a search of the common course catalog determines an existing common course exists, complete the Authority to Offer an Existing Course Form. Courses requested without an attempt to find comparable courses will not be reviewed.*

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 763</td>
<td>Topics in Reliability Engineering (SDSU)</td>
<td>3</td>
</tr>
<tr>
<td>MEM 665</td>
<td>Equipment Maintenance Reliability and Management</td>
<td>3</td>
</tr>
</tbody>
</table>

*Provide explanation of differences between proposed course and existing system catalog courses below:*

The ME 763 Topics in Reliability Engineering does not have a specific course description and is offered at the 7XX level. The proposed Reliability in Mechanical Systems course requires the use of mathematics at the 6XX level. There are no PDE’s required, so don’t believe this rises to the level of a 7XX course. Then the MEM 665 focuses on a different reliability application of equipment maintenance instead of mechanical system design.

☐ **Common Course**

*Indicate universities that are proposing this common course:*

☐ BHSU ☐ DSU ☐ NSU ☐ SDSMT ☐ SDSU ☐ USD

**Section 3. Other Course Information**

3.1. **Are there instructional staffing impacts?**

☐ **No.** Replacement of _____________________________

(course prefix, course number, name of course, credits)

*Attach course deletion form

Effective date of deletion:  [Click here to enter a date.]

☑ **No.** Schedule Management, explain below:

Dr. Jason Ash, Associate Professor in Mechanical Engineering taught this as a topics course in Fall 2020. This will be worked into his regular course rotation.

☐ **Yes.** Specify below:

3.2. **Existing program(s) in which course will be offered (i.e., any current or pending majors, minors, certificates, etc.):** this will be an elective course offering for MSME and ME PhD

3.3. **Proposed instructional method by university (as defined by AAC Guideline 5.4):**
If requesting an instructional method that is exempt from the Section Size Guidelines, please provide a brief description of how the course is appropriate for the instructional method, as defined in AAC Guidelines.

R Lecture

3.4. Proposed delivery method by university (as defined by AAC Guideline 5.5):

001 Face-to-face Term Based Instruction

3.5. Term change will be effective: Fall 2022

3.6. Can students repeat the course for additional credit?

☐ Yes, total credit limit: __________ ☒ No

3.7. Will grade for this course be limited to S/U (pass/fail)?

☐ Yes ☒ No

3.8. Will section enrollment be capped?

☒ Yes, max per section: 25 ☐ No

3.9. Will this course equate (i.e., be considered the same course for degree completion) with any other unique or common courses in the common course system database?

☐ Yes ☒ No

If yes, indicate the course(s) to which the course will equate (add lines as needed):

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
</tr>
</thead>
</table>

3.10. Is this prefix approved for your university?

☒ Yes ☐ No

If no, provide a brief justification below:

Section 4. Department and Course Codes (Completed by University Academic Affairs)

4.1. University Department: ME

4.2. Banner Department Code: MME

4.3. Proposed CIP Code: 141901

Is this a new CIP code for the university? ☐ Yes ☒ No
Ash, Jason T.

From: Liu, Yucheng <Yucheng.Liu@sdsstate.edu>
Sent: Monday, February 28, 2022 11:24 AM
To: Ash, Jason T.
Subject: [EXT] RE: Reliability in Mechanical Systems (New Course Request Approval)

*** This email is from an EXTERNAL sender. Use CAUTION before opening attachments or clicking links.***

Dear Dr. Ash,

Having compared your new course with the existing courses in the ME program at South Dakota State University, I don’t see this course overlaps with any of our existing 600 level courses. I herewith support your request of adding the course “Reliability in Mechanical Systems”. Please let me know if I can be of any other assistance.

Best Regards,

Yucheng

Yucheng Liu, PhD, PE
Department Head and Duane Sander Professor
ASME Fellow, SAE Fellow
Mechanical Engineering Department
Jerome J. Lohr College of Engineering
South Dakota State University

Crothers Engineering Hall 221, Box 2219
Brookings, SD 57007
Telephone: (605)688-5426; Fax: (605)688-5878
Email: yucheng.liu@sdsstate.edu

---

From: Ash, Jason T. <Jason.Ash@sdsm.t.edu>
Sent: Monday, February 28, 2022 10:56 AM
To: Liu, Yucheng <Yucheng.Liu@sdsstate.edu>
Cc: Larochelle, Pierre M. <pierre.larochelle@sdsmt.edu>
Subject: Reliability in Mechanical Systems (New Course Request Approval)

Good morning Dr. Liu:

I have attached another new course request that we would like to submit for approval. This is for ME 681: Reliability in Mechanical Systems. This was a course I taught for the first time in Fall 2020 as a special topics course. SDSU does have a ME 763 listed, but there is no course description and I would like to teach this at the 6XX level. I believe this is unique enough then to be approved by the SD BOR. Would you review and reply back if you support this new course request?

Thank you,

Jason
Jason Ash, Ph.D.
Associate Professor of Mechanical Engineering
South Dakota School of Mines & Technology
501 East Saint Joseph St.
Rapid City, SD 57701
Office: CM128B
Phone: 605-395-3736
Email: Jason.Ash@sdmt.edu
Hi Jason,

I am supportive of this course. I do a couple of weeks of reliability modelling in the course I offer, but mostly related to the application toward mining equipment failure data.

I had copied Dr. McCormick and Dr. Allard so that they are aware when they see it at CGE and curriculum.

Regards
RAH

Hello Dr. Hall:

I have attached a new course request that we would like to submit for approval. This is for ME 681: Reliability in Mechanical Systems. This was a course I taught for the first time in Fall 2020 as a special topics course. I see that you have a MEM 665 Equipment Maintenance Reliability and Management course. My course would focus more on the reliability of mechanical systems. I believe this is unique enough then to be approved by the SD BOR. Would you review and reply back if you support this new course request?

Thank you,
Jason

Jason Ash, Ph.D.
Associate Professor of Mechanical Engineering
South Dakota School of Mines & Technology
501 East Saint Joseph St.
Rapid City, SD 57701
Office: CM1288
Phone: 605-395-3736
Email: Jason.Ash@sdsmt.edu
New Course Request

Use this form to request a new common or unique course. Consult the system course database through for information about existing courses before submitting this form.

SDSM&T Materials and Metallurgical Engineering
Institution Division/Department 2/28/2022

Institutional Approval Signature Date

Section 1. Course Title and Description
If the course contains a lecture and laboratory component, identify both the lecture and laboratory numbers (xxx and xxxL) and credit hours associated with each. Provide the complete description as you wish it to appear in the system course database, including pre-requisites, co-requisites, and registration restrictions.

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MET 300/300L</td>
<td>Applied Glass and Ceramic Engineering</td>
<td>2-1</td>
</tr>
</tbody>
</table>

NOTE: The Enrollment Services Center assigns the short, abbreviated course title that appears on transcripts. The short title is limited to 30 characters (including spaces); meaningful but concise titles are encouraged due to space limitations in the student information system.

Course Description
The lecture component introduces students to practical knowledge of the methods and techniques used in the fabrication, design, processing, and characterization of ceramics and glasses. The fundamentals of ceramic and glass formulation, thermodynamics, color integration, and characterization to correlate composition and properties will be included. The laboratory portion will examine clay-based ceramics and molten glass properties and behaviors including basic forming techniques, molding, casting and mechanical properties.

NOTE: Course descriptions are short, concise summaries that typically do not exceed 75 words. DO: Address the content of the course and write descriptions using active verbs (e.g., explore, learn, develop, etc.). DO NOT: Repeat the title of the course, layout the syllabus, use pronouns such as “we” and “you,” or rely on specialized jargon, vague phrases, or clichés.

Pre-requisites or Co-requisites (add lines as needed)

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Pre-Req/Co-Req?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem 112</td>
<td>General Chemistry I</td>
<td></td>
</tr>
<tr>
<td>MET 232 OR</td>
<td>Properties of Materials OR Properties of Biomaterials</td>
<td>Pre-Req</td>
</tr>
<tr>
<td>BME/MET 233</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Registration Restrictions
Section 2. Review of Course

2.1. Will this be a unique or common course (place an “X” in the appropriate box)?

☒ Unique Course

If the request is for a unique course, institutions must review the common course catalog in the system course database to determine if a comparable common course already exists. List the two closest course matches in the common course catalog and provide a brief narrative explaining why the proposed course differs from those listed. If a search of the common course catalog determines an existing common course exists, complete the Authority to Offer an Existing Course Form. Courses requested without an attempt to find comparable courses will not be reviewed.

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 251</td>
<td>Ceramics I</td>
<td>3-0</td>
</tr>
<tr>
<td>GEOL 201</td>
<td>Physical Geology</td>
<td>3-0</td>
</tr>
</tbody>
</table>

Provide explanation of differences between proposed course and existing system catalog courses below:

ART 251 focuses on the methods of forming, decorating, glazing, and firing pottery. MET 300/300L course students will learn in the lab portion the traditional techniques of forming, glazing, and firing, but they will achieve an understanding of science and engineering concepts associated with these materials. This understanding requires knowledge of the chemistry and physics that lead to structure/property relationships. Students will also utilize phase diagrams and thermodynamics to understand glazing effects such as vitrification and color theory.

Additionally, MET300/300L will also cover glass theory and fabrication processes which is not covered in ART 251.

GEOL 201 studies the earth and its history. In this course students will learn about minerals and igneous, sedimentary, and metamorphic rock. This course would provide background into the clay and minerals we would use for ceramics, but does not cover glasses, nor does it cover the engineering and processing side that will be explored in MET300/300L.

☐ Common Course

Indicate universities that are proposing this common course:

☐ BHSU  ☐ DSU  ☐ NSU  ☐ SDSMT  ☐ SDSU  ☐ USD

Section 3. Other Course Information

3.1. Are there instructional staffing impacts?

☐ No. Replacement of

(course prefix, course number, name of course, credits)

*Attach course deletion form
Effective date of deletion:  

☒  No.  Schedule Management, explain below:
This course will not be a scheduling issue as Katrina Donovan has an open spot on her teaching load in the Spring of odd years to teach this course.

☐  Yes. Specify below:

3.2. Existing program(s) in which course will be offered (i.e., any current or pending majors, minors, certificates, etc.):
Metallurgical Engineering
Ceramic Engineering Minor (pending)

3.3. Proposed instructional method by university (as defined by AAC Guideline 5.4):
If requesting an instructional method that is exempt from the Section Size Guidelines, please provide a brief description of how the course is appropriate for the instructional method, as defined in AAC Guidelines.

Method Code (R)
Lecture: The lecture portion will cover the theory of glass and ceramic materials. In the lecture the students will learn the atomic and molecular differences between the two materials. They will dive into the physics, chemistry, and processing that gives us the wide range of glass and ceramic materials we have.

Method Code (L)
Laboratory: The kinesthetic laboratory component will enhance and reinforce technical concepts of the lecture. Observing and feeling a material move or flow is critical to visualizing what is happening to the material on a fundamental level.

3.4. Proposed delivery method by university (as defined by AAC Guideline 5.5): Method Code:
001 Face-to-Face Term Based Instruction

3.5. Term change will be effective: Fall 2022

3.6. Can students repeat the course for additional credit?
☐  Yes, total credit limit:  
☒  No

3.7. Will grade for this course be limited to S/U (pass/fail)?
☐  Yes  
☒  No

3.8. Will section enrollment be capped?
☒  Yes, max per section: 16  
☐  No

3.9. Will this course equate (i.e., be considered the same course for degree completion) with any other unique or common courses in the common course system database?
☐  Yes  
☒  No
If yes, indicate the course(s) to which the course will equate (add lines as needed):

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
</tr>
</thead>
</table>

3.10. Is this prefix approved for your university?
☒ Yes ☐ No

If no, provide a brief justification below:

Section 4. Department and Course Codes (Completed by University Academic Affairs)


4.2. Banner Department Code: MMET

4.3. Proposed CIP Code: 14.0601

Is this a new CIP code for the university? ☒ Yes ☐ No
South Dakota Board of Regents
Academic Affairs Forms
New Course Request

Use this form to request a new common or unique course. Consult the system course database through for information about existing courses before submitting this form.

SDSM&T
Institution

Materials and Metallurgical Engineering
Division/Department

Institutional Approval Signature
Date

Section 1. Course Title and Description
If the course contains a lecture and laboratory component, identify both the lecture and laboratory numbers (xxx and xxxL) and credit hours associated with each. Provide the complete description as you wish it to appear in the system course database, including pre-requisites, co-requisites, and registration restrictions.

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MET 400/500</td>
<td>Fundamentals of Glass and Ceramic Engineering</td>
<td>3-0</td>
</tr>
</tbody>
</table>

Note: The Enrollment Services Center assigns the short, abbreviated course title that appears on transcripts. The short title is limited to 30 characters (including spaces); meaningful but concise titles are encouraged due to space limitations in the student information system.

Course Description
A course concerned with the principles that underpin the engineering of nonmetallic, inorganic solids. Topics covered in the first portion of the course include crystallography, glass structure, and microstructural defects in ceramics. The second portion of the course explores the mechanical, electrical, optical, magnetic, and thermal properties of glasses and ceramics. Characteristic differences between ceramics and metals are emphasized throughout the course. Connections to the related fields of mineralogy and geology are also developed.

Note: Students enrolled in MET 500 will be held to a higher standard than those enrolled in MET 400.

Note: Course descriptions are short, concise summaries that typically do not exceed 75 words. Do: Address the content of the course and write descriptions using active verbs (e.g., explore, learn, develop, etc.). Do not: Repeat the title of the course, layout the syllabus, use pronouns such as “we” and “you,” or rely on specialized jargon, vague phrases, or clichés.

Pre-requisites or Co-requisites (add lines as needed)

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Pre-Req/Co-Req?</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 112</td>
<td>General Chemistry I</td>
<td>Pre-Req</td>
</tr>
<tr>
<td>MET 232 OR BME/MET 233</td>
<td>Properties of Materials OR Properties of Biomaterials</td>
<td>Pre-Req</td>
</tr>
</tbody>
</table>

Registration Restrictions
Section 2. Review of Course

2.1. Will this be a unique or common course (place an “X” in the appropriate box)?

☒ Unique Course

If the request is for a unique course, institutions must review the common course catalog in the system course database to determine if a comparable common course already exists. List the two closest course matches in the common course catalog and provide a brief narrative explaining why the proposed course differs from those listed. If a search of the common course catalog determines an existing common course exists, complete the Authority to Offer an Existing Course Form. Courses requested without an attempt to find comparable courses will not be reviewed.

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOL 212/212L</td>
<td>Mineralogy and Crystallography/Lab*</td>
<td>2-1</td>
</tr>
<tr>
<td>PHYS 439/539</td>
<td>Condensed Matter Physics*</td>
<td>4-0</td>
</tr>
</tbody>
</table>

Provide explanation of differences between proposed course and existing system catalog courses below:

*No comparable courses could be found in the common course catalog. These courses listed represent those that are most comparable within the South Dakota Mines catalog.

GEOL 212/212L covers the structure and properties of minerals from a geological perspective. In MET 400/500, ceramics and glasses will be studied from a materials science perspective by developing an understanding of the relationships between crystal structure, defects, and properties. Additionally, GEOL 212/212L focuses specifically on rock-forming minerals, ore minerals, industrial minerals, and minerals of environmental importance. The content of MET 400/500 will not be limited to geological minerals but will also cover synthetic ceramics such as semiconductors and engineered glasses. Thus, while connections to mineralogy will be made in MET 400/500, ultimately the scope extends beyond GEOL 212/212L.

PHYS 439/539 covers the basic crystallography and the mechanical, thermal, and electronic properties of solid materials, in general. MET 400/500 builds upon much of the basic science addressed in PHYS 439/539 but focuses specifically on ceramics and glasses. By exploring the uniqueness of ceramics and glasses relative to other solid materials, such as metals, students will develop an understanding of the reasons ceramics and glasses play so many critical roles in both advanced and traditional technologies.

☐ Common Course Indicate universities that are proposing this common course:

☐ BHSU ☐ DSU ☐ NSU ☐ SDSMT ☐ SDSU ☐ USD

Section 3. Other Course Information
3.1. Are there instructional staffing impacts?

☐ No. Replacement of (course prefix, course number, name of course, credits)
*Attach course deletion form

Effective date of deletion: [Click here to enter a date.]

☒ No. Schedule Management, explain below: The teaching and/or research faculty will rotate to teach this course.

☐ Yes. Specify below:

3.2. Existing program(s) in which course will be offered (i.e., any current or pending majors, minors, certificates, etc.):

Metallurgical Engineering
Ceramic Engineering Minor (pending)

3.3. Proposed instructional method by university (as defined by AAC Guideline 5.4):

If requesting an instructional method that is exempt from the Section Size Guidelines, please provide a brief description of how the course is appropriate for the instructional method, as defined in AAC Guidelines.

Method Code: Lecture (R)

3.4. Proposed delivery method by university (as defined by AAC Guideline 5.5):

Method Code: 001 Face-to-face Term Based Instruction

3.5. Term change will be effective:

Fall 2022

3.6. Can students repeat the course for additional credit?

☐ Yes, total credit limit: __________  ☒ No

3.7. Will grade for this course be limited to S/U (pass/fail)?

☐ Yes  ☒ No

3.8. Will section enrollment be capped?

☐ Yes, max per section: __________  ☒ No

3.9. Will this course equate (i.e., be considered the same course for degree completion) with any other unique or common courses in the common course system database?

☐ Yes  ☒ No

If yes, indicate the course(s) to which the course will equate (add lines as needed):
Prefix & No. | Course Title
---|---

3.10. Is this prefix approved for your university?
☒ Yes ☐ No

*If no, provide a brief justification below:*

Section 4. Department and Course Codes (Completed by University Academic Affairs)

4.1. University Department: MET

4.2. Banner Department Code: MMET

4.3. Proposed CIP Code: 14.0601

*Is this a new CIP code for the university?* ☒ Yes ☐ No
Use this form to request a new common or unique course. Consult the system course database through for information about existing courses before submitting this form.

<table>
<thead>
<tr>
<th>Institution</th>
<th>Division/Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDSM&amp;T</td>
<td>MMET</td>
</tr>
</tbody>
</table>

Institutional Approval Signature

Section 1. Course Title and Description
If the course contains a lecture and laboratory component, identify both the lecture and laboratory numbers (xxx and xxxL) and credit hours associated with each. Provide the complete description as you wish it to appear in the system course database, including pre-requisites, co-requisites, and registration restrictions.

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MET 485/585</td>
<td>Powder Metallurgy</td>
<td>(1-0) 1</td>
</tr>
</tbody>
</table>

NOTE: The Enrollment Services Center assigns the short, abbreviated course title that appears on transcripts. The short title is limited to 30 characters (including spaces); meaningful but concise titles are encouraged due to space limitations in the student information system.

Course Description
The fundamental concepts related to metal powder production, characterization of powders, consolidation techniques and applications of various powder metallurgy components will be covered in this course. Topics will include methods of powder production, basic principles of compaction, sintering mechanisms, isostatic pressing techniques, secondary processing, as well as properties and applications.

NOTE: Course descriptions are short, concise summaries that typically do not exceed 75 words. DO: Address the content of the course and write descriptions using active verbs (e.g., explore, learn, develop, etc.). DO NOT: Repeat the title of the course, layout the syllabus, use pronouns such as “we” and “you,” or rely on specialized jargon, vague phrases, or clichés.

Pre-requisites or Co-requisites (add lines as needed)

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Pre-Req/Co-Req?</th>
</tr>
</thead>
<tbody>
<tr>
<td>MET 232</td>
<td>Properties of Materials</td>
<td>Pre-req</td>
</tr>
</tbody>
</table>

Or Graduate Standing

Registration Restrictions
Section 2. Review of Course

2.1. Will this be a unique or common course (place an “X” in the appropriate box)?

☒ Unique Course

*If the request is for a unique course, institutions must review the common course catalog in the system course database to determine if a comparable common course already exists. List the two closest course matches in the common course catalog and provide a brief narrative explaining why the proposed course differs from those listed. If a search of the common course catalog determines an existing common course exists, complete the Authority to Offer an Existing Course Form. Courses requested without an attempt to find comparable courses will not be reviewed.*

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MET 432</td>
<td>Advanced Materials and Processes</td>
<td>3 credits</td>
</tr>
<tr>
<td>MET 330</td>
<td>Physics of Metals</td>
<td>3 credits</td>
</tr>
</tbody>
</table>

Provide explanation of differences between proposed course and existing system catalog courses below:

Met 330 deals with the fundamental principles of physical metallurgy, and mechanisms that control the structure of materials. MET 432 deals with the processing methods and applications of various advanced metallic materials. The proposed new course on Powder Metallurgy deals with the fundamentals of powder production, compaction and sintering mechanisms and also deals with various applications of powder metallurgy components for a wide range of industries. This will be a unique course which will provide a fundamental and detailed understanding of powder materials, and the metallurgical engineering students will greatly benefit by taking this course.

☐ Common Course

Indicate universities that are proposing this common course:

☐ BHSU ☐ DSU ☐ NSU ☐ SDSMT ☐ SDSU ☐ USD

Section 3. Other Course Information

3.1. Are there instructional staffing impacts?

☐ No. Replacement of

(course prefix, course number, name of course, credits)

*Attach course deletion form

Effective date of deletion: Click here to enter a date.

☒ Yes. Schedule Management, explain below:

Course will be added to departmental course rotation, so no staffing impacts are anticipated.

☐ Yes. Specify below:
3.2. Existing program(s) in which course will be offered (i.e., any current or pending majors, minors, certificates, etc.):
The course will be offered to metallurgical engineering undergraduate students, and also to MES graduate students. This course will also be available to other graduate or undergraduate students with permission of instructor.

3.3. Proposed instructional method by university (as defined by AAC Guideline 5.4):
If requesting an instructional method that is exempt from the Section Size Guidelines, please provide a brief description of how the course is appropriate for the instructional method, as defined in AAC Guidelines.
R- Lecture

3.4. Proposed delivery method by university (as defined by AAC Guideline 5.5):
001 Face-to-face Term Based Instruction

3.5. Term change will be effective:
Fall 2022

3.6. Can students repeat the course for additional credit?
☐ Yes, total credit limit: __________
☒ No

3.7. Will grade for this course be limited to S/U (pass/fail)?
☐ Yes
☒ No

3.8. Will section enrollment be capped?
☐ Yes, max per section: __________
☒ No

3.9. Will this course equate (i.e., be considered the same course for degree completion) with any other unique or common courses in the common course system database?
☐ Yes
☒ No
If yes, indicate the course(s) to which the course will equate (add lines as needed):

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3.10. Is this prefix approved for your university?
☒ Yes
☐ No
If no, provide a brief justification below:

Section 4. Department and Course Codes (Completed by University Academic Affairs)

4.1. University Department: MMET

4.2. Banner Department Code: MMET

4.3. Proposed CIP Code: 142001
New Course Request

Use this form to request a new common or unique course. Consult the system database through Colleague or the Course Inventory Report for information about existing courses before submitting this form.

<table>
<thead>
<tr>
<th>SDSM&amp;T Institution</th>
<th>Physics Division/Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Click here to enter a date.</td>
<td></td>
</tr>
</tbody>
</table>

Institutional Approval Signature

Section 1. Course Title and Description

If the course contains a lecture and laboratory component, identify both the lecture and laboratory numbers (xxx and xxxL) and credit hours associated with each. Provide the complete description as you wish it to appear in the system database in Colleague and the Course Inventory Report including pre-requisites, co-requisites, and registration restrictions.

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phys 449/549</td>
<td>Computational Physics</td>
<td>4</td>
</tr>
</tbody>
</table>

NOTE: The Enrollment Services Center assigns the short, abbreviated course title that appears on transcripts. The short title is limited to 30 characters (including spaces); meaningful but concise titles are encouraged due to space limitations in Colleague.

Course Description

The course emphasizes ideas of computational physics and programming languages and skills for solving problems. Areas of application may include quantum mechanics, atomic physics, nuclear and particle physics, astrophysics, condensed matter physics, nonlinear dynamics and chaos, biophysics, materials science, engineering, and chemistry.

Note: Students enrolled in PHYS 549 will be held to a higher standard than those enrolled in PHYS 449.

NOTE: Course descriptions are short, concise summaries that typically do not exceed 75 words. DO: Address the content of the course and write descriptions using active verbs (e.g., explore, learn, develop, etc.). DO NOT: Repeat the title of the course, layout the syllabus, use pronouns such as "we" and "you," or rely on specialized jargon, vague phrases, or clichés.

Pre-requisites or Co-requisites (add lines as needed)

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Pre-Req/Co-Req</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phys 331/431</td>
<td>Introduction to Modern Physics</td>
<td>Pre-req</td>
</tr>
<tr>
<td>CSC 170/170L or CSC 155/155L or CSC 150/150L or INFO 101</td>
<td>Programming for Engineering and Scientists Introduction to Computer Science &amp; Programming Computer Science I Introduction to Informatics</td>
<td>Pre-req</td>
</tr>
</tbody>
</table>
Registration Restrictions

Section 2. Review of Course

2.1. Was the course first offered as an experimental course (place an "X" in the appropriate box)?
   ☐ Yes  ☒ No

2.2. Will this be a unique or common course (place an "X" in the appropriate box)?
   If the request is for a unique course, verify that you have reviewed the common course catalog via Colleague and the system Course Inventory Report to determine if a comparable common course already exists. List the two closest course matches in the common course catalog and provide a brief narrative explaining why the proposed course differs from those listed. If a search of the common course catalog determines an existing common course exists, complete the Authority to Offer an Existing Course Form.

☐ Unique Course

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 373</td>
<td>Introduction to Numerical Analysis</td>
<td>3</td>
</tr>
<tr>
<td>MATH 321</td>
<td>Differential Equations</td>
<td>3</td>
</tr>
</tbody>
</table>

Provide explanation of differences between proposed course and existing system catalog courses below:

Computational Physics course is not offered in SDBOR system. The course emphasizes ideas of computational physics and programming languages and skills for solving problems. Areas of application may include quantum mechanics, atomic physics, nuclear and particle physics, astrophysics, condensed matter physics, nonlinear dynamics and chaos, biophysics, materials science, engineering, and chemistry. Most of the Physics Departments across the country offer a similar course to their majors, the value has been established by research, and hence its offering is strongly endorsed by American Physics Teacher's Associations. The course will bring our undergraduate program in line with similar programs in the country. The course includes a hands-on session on algorithm development and lectures discussing the concepts of computational physics. Grading will be on a standard A-F letter scale.

The course may overlap algorithms with two other courses: Introduction to Numerical Analysis (MATH 373) and Differential Equations (MATH 321). The description for MATH 373 is as follows: "This course is an introduction to numerical methods. Topics include elementary discussion of errors, polynomial interpolation, quadrature, nonlinear equations, and systems of linear equations. The algorithmic approach and efficient use of the computer will be emphasized. Additional topics may include calculation of eigenvalues and eigenvectors, numerical differentiation and integration, numerical solution of differential equations."
Similarly, the description for MATH 321 is as follows: "Selected topics from ordinary differential equations including development and applications of the first order, higher-order linear and systems of linear equations, general solutions and solutions to initial-value problems using matrices. Additional topics may include Laplace transforms and power series solutions. In addition to analytical methods, this course will also provide an introduction to numerical solution techniques."

Both courses emphasize algorithmic solutions to traditional mathematical problems; the prerequisites for MATH 373 include Math 321, CSC 150/150L. The emphasis on the developing solution of the physical problem is their peripheral interest. In contrast, the proposed course focus on solving the problem in different areas of physical sciences, including nuclear and particle physics, astrophysics, and condensed matter physics.

The course is expected to be one semester-long and expected to be offered every year.

☒ Common Course  
Indicate universities that are proposing this common course:

☐ BHSU  ☐ DSU  ☐ NSU  ☒ SDSMT  ☒ SDSU  ☒ USD

Section 3. Other Course Information

3.1. Are there instructional staffing impacts?

☒ No. Replacement of  
(course prefix, course number, name of course, credits)  
*Attach course deletion form

Effective date of deletion:  
Click here to enter a date.

☒ No. Schedule Management, explain below:  
This course will be offered as an elective as needed and will be taught by existing faculty.

☐ Yes. Specify below:

3.2. Existing program(s) in which course will be offered:  
Physics, Engineering, Chemistry

3.3. Proposed instructional method by university:  
R

3.4. Proposed delivery method by university:  
Face-to-face

3.5. Term change will be effective:  
Spring 2023

3.6. Can students repeat the course for additional credit?
☐ Yes, total credit limit: ________ ☒ No

3.7. Will grade for this course be limited to S/U (pass/fail)?
☐ Yes ☒ No

3.8. Will section enrollment be capped?
☒ Yes, max per section: 24 ☐ No

3.9. Will this course equate (i.e., be considered the same course for degree completion) with any other unique or common courses in the common course system database in Colleague and the Course Inventory Report?
☐ Yes ☒ No
If yes, indicate the course(s) to which the course will equate (add lines as needed):

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
</tr>
</thead>
</table>

3.10. Is this prefix approved for your university?
☒ Yes ☐ No
If no, provide a brief justification below:

Section 4. Department and Course Codes (Completed by University Academic Affairs)

4.1. University Department Code: Phys ________________________________

4.2. Banner Department Code: MPHY ________________________________

4.3. Proposed CIP Code: 400801

Is this a new CIP code for the university? ☐ Yes ☐ No
USD endorses this new course request. Yongchen Sun

SDSU endorses this New Course Request.

Doug

From: Paudel, Tula R. <Tula.Paudel@sdsmt.edu>
Sent: Monday, January 17, 2022 10:30 AM
To: Schnee, Richard W. <Richard.Schnee@sdsmt.edu>; Sun, Yongchen <Yongchen.Sun@usd.edu>; Raynie, Douglas <Douglas.Raynie@SDSTATE.EDU>
Cc: Sander, Joel <Joel.Sander@usd.edu>; Sobolev, Vladimir <vladimir.sobolev@sdsmt.edu>; McTaggart, Robert <Robert.Mctaggart@sdsmt.edu>
Subject: Proposed Computational Physics Course

Dear Prof. Schnee, Prof Sun, and Prof. Raynie,

I am writing to seek your approval to submit the proposed Computational Physics course Phys 449/549 for approval as a common elective for Undergraduate Physics majors at the South Dakota School of Mines and Technology, the University of South Dakota, and South Dakota State University.

I have attached the New Course Request form for your reference. Please let me know if you suggest any changes to it. I have also attached my plans for the course syllabus.

Thank you,
Tula

Tula R. Paudel (Tula, He/his/him)  
Assistant Professor  
Physics (PHYS)  
Email: Tula.Paudel@sdsmt.edu  
605-394-2726  
EP 119 (campus map)
SOUTH DAKOTA BOARD OF REGENTS
ACADEMIC AFFAIRS FORMS

Revised Course Request: Unique Course
(Substantive Modification)

Use this form to request a substantive change to an existing unique course. Consult the system course database for information about existing courses. If the course revision is for an approved General Education course, please see the Revision to General Education Requirements Form. Signatures are required on the final form submitted to the Academic Affairs Council (AAC).

<table>
<thead>
<tr>
<th>SDSM&amp;T Institution</th>
<th>Dr. Katrina Donovan</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Form Initiator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SDSM&amp;T Institution</td>
<td>Dr. Michael West</td>
<td></td>
</tr>
<tr>
<td>Division/Department</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dean’s Approval Signature</th>
<th>Date</th>
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</table>

<table>
<thead>
<tr>
<th>Institutional Approval Signature</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Section 1. Existing Course Title and Description

If changing from a course that previously had only a lecture or laboratory component to a composite course, identify both the course and laboratory numbers (xxx and xxxL) and credit hours associated with each. Provide the complete course description as it appears in the system course database including pre-requisites, co-requisites, and registration restrictions.

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MET</td>
<td>110</td>
<td>0-1</td>
</tr>
</tbody>
</table>

**Course Description**

An introductory course for incoming freshmen in metallurgical engineering covering the history of, career opportunities in, and engineering practices of metallurgical engineering. This course will include group projects and presentations, problem solving, engineering ethics, technical reports and field trips.

Section 2. Modification(s) Requested

2.1. This modification will include (place an “X” in the box for all that apply):

- [ ] A change in description/subject matter content (enter revised description below).

*Note: Course descriptions are short, concise summaries that typically do not exceed 75 words. DO: Address the content of the course and write descriptions using active verbs (e.g., explore, learn, develop, etc.). DO NOT: Repeat the title of the course, layout the syllabus, use pronouns such as “we” and “you,” or rely on specialized jargon, vague phrases, or clichés.*
Change in instructional method

☐ Change in instructional method

☐ Lecture to Laboratory

Addition/deletion of a lab/lecture component (explain below)

If the addition of a lab/lecture component requires a change in pre-requisites or co-requisites, indicate below (add lines as needed, make sure to copy and paste formatting)

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Pre-Req/Co-Req?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Choose an item.</td>
</tr>
</tbody>
</table>

Will the grade for this lab/lecture component be limited to S/U (pass/fail)?

☐ Yes

☒ No

Will section enrollment for the lab/lecture component be capped?

☐ Yes, max per section: ________

☒ No

Change to existing unique course:

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTE: Use the Authority to Offer an Existing Course Form to request authorization to offer an existing common or unique course.

Effective term of the change: FA 2022

Explain any additional minor changes proposed at this time below (if needed):

2.2. Add justification for all changes noted above:

The course has multiple learning modules (laboratory assignments, field trips, etc.) that require longer than the allocated 50 minute time slot. This modification will allow the safe completion of laboratory experiments and field trips.
Section 3. Other Course Information

3.1. Will this course equate (i.e., be considered the same course for degree completion) with any other unique or common courses in the common course database?

☐ Yes ☒ No

*If yes, indicate the course(s) to which the course will equate (add lines as needed):*

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Section 4. Department and Course Codes (Completed by University Academic Affairs)

- ☐ Change in University Department Code

<table>
<thead>
<tr>
<th>Current</th>
<th>New</th>
</tr>
</thead>
<tbody>
<tr>
<td>_____________</td>
<td>_____________</td>
</tr>
</tbody>
</table>

- ☐ Change in Banner Department Code

<table>
<thead>
<tr>
<th>Current</th>
<th>New</th>
</tr>
</thead>
<tbody>
<tr>
<td>_____________</td>
<td>_____________</td>
</tr>
</tbody>
</table>

- ☐ Change in CIP Code

<table>
<thead>
<tr>
<th>Current</th>
<th>New</th>
</tr>
</thead>
<tbody>
<tr>
<td>_____________</td>
<td>_____________</td>
</tr>
</tbody>
</table>
Section 1. Existing Course Title and Description
If changing from a course that previously had only a lecture or laboratory component to a composite course, identify both the course and laboratory numbers (xxx and xxxL) and credit hours associated with each. Provide the complete course description as it appears in the system course database including pre-requisites, co-requisites, and registration restrictions.

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSC 413</td>
<td>Introduction Virtual Reality</td>
<td>2</td>
</tr>
</tbody>
</table>

**Course Description**
This course is an introduction into virtual reality and focuses on core requirements of virtual reality. The course includes development needs, movement, and heads up display, and world requirements.

Section 2. Modification(s) Requested
2.1. This modification will include *(place an “X” in the box for all that apply)*:

☒ A change in description/subject matter content (enter revised description below).

This course is an introduction into virtual reality and focuses on core requirements of virtual reality. The course includes development needs, movement, heads up display, and world requirements.

*Note: Course descriptions are short, concise summaries that typically do not exceed 75 words. DO: Address the content of the course and write descriptions using active verbs (e.g., explore, learn, develop, etc.). DO NOT: Repeat the title of the course, layout the syllabus, use pronouns such as “we” and “you,” or rely on specialized jargon, vague phrases, or clichés.*
☐ Change in instructional method

☐ Addition/deletion of a lab/lecture component (explain below)

The addition of a 1 credit, co-req, lab section is needed as the hardware is supplied by the department and may not be taken off campus. Thus, additional access time is needed. This changes the credit count from 2-0 to a 2-1.

If the addition of a lab/lecture component requires a change in pre-requisites or co-requisites, indicate below (add lines as needed, make sure to copy and paste formatting)

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Pre-Req/Co-Req?</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSC 413L</td>
<td>Introduction Virtual Reality</td>
<td>Co-req to CSC 413</td>
</tr>
</tbody>
</table>

Will the grade for this lab/lecture component be limited to S/U (pass/fail)?

☐ Yes ☒ No

Will section enrollment for the lab/lecture component be capped?

☒ Yes, max per section: 25 ☐ No

☐ Change to existing unique course:

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
</table>

NOTE: Use the Authority to Offer an Existing Course Form to request authorization to offer an existing common or unique course.

Effective term of the change: Fall 2022

☒ Explain any additional minor changes proposed at this time below (if needed):

CSC 413L will be a co-req to CSC 413 and CSC 413 will be a co-req to CSC 413L

2.2. Add justification for all changes noted above:

Section 3. Other Course Information
3.1. Will this course equate (i.e., be considered the same course for degree completion) with any other unique or common courses in the common course database?

☐ Yes  ☒ No

*If yes, indicate the course(s) to which the course will equate (add lines as needed):*

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
</tr>
</thead>
</table>

Section 4. Department and Course Codes (Completed by University Academic Affairs)

☐ Change in University Department Code  

Current: ___________  to  New: ___________

☐ Change in Banner Department Code  

Current: ___________  to  New: ___________

☐ Change in CIP Code  

Current: ___________  to  New: ___________
Revised Course Request: Common Course
(Substantive Modifications)

Use this form to request a substantive change to an existing common course. Representatives from all institutions offering the common course must participate in developing the proposed revisions to a common course. Signatures from all institutions offering the common course must be included on the final form submitted to the Academic Affairs Council (AAC). Consult the system database for information about existing courses. If the course revision is for an approved General Education course, please see the Revision to General Education Requirements Form.

SDSM&T  Travis Kowalski  1/17/2022
Institution  Form Initiator  Date

Mathematics
Institution  Division/Department

SDSM&T  1/17/2022
Institution  Institutional Approval Signature  Date

Indicate universities that currently offer the common course:

☒ BHSU  ☒ DSU  ☒ NSU  ☒ SDSMT  ☒ SDSU  ☒ USD

Section 1. Existing Course Title and Description
If changing from a course that previously had only a lecture or laboratory component to a composite course, identify both the course and laboratory numbers (xxx and xxxL) and credit hours associated with each. Provide the complete description as it appears in the system database, including prerequisites, co-requisites, and registration restrictions.

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 123</td>
<td>Calculus I</td>
<td>4</td>
</tr>
</tbody>
</table>

Course Description
The study of limits, continuity, derivatives, applications of the derivative, antiderivatives, the definite and indefinite integral, and the fundamental theorem of calculus.

Section 2. Modification(s) Requested
Check all revisions that apply and provide detailed information in the Current and New fields below. If changing a course that previously had only a lecture or laboratory component to a composite course, identify both the course and laboratory numbers (xxx and xxxL) and credit hours associated with each.
2.1. This modification will include (place an “X” in the box for all that apply):

☐ Prefix change from __________________________ to __________________________

Indicate any university for which this must be added as new prefix:

☐ BHSU  ☐ DSU  ☐ NSU  ☐ SDSMT  ☐ SDSU  ☐ USD

☐ Change in instructional method

☐ Course Title change from __________________________ to __________________________

☐ Credit Hours change from __________________________ to __________________________

☒ Pre-Requisites

[MATH 115 ≥ D]  □ OR [MATH 116 ≥ D]
[MATH 120 ≥ D]  □ OR [MATH 120 ≥ D]
[Math Index ≥ 1300]  □ OR [Math Index ≥ 1300]
AND ACCU Calculus Readiness ≥ 19]  □ OR ACCU Calculus Readiness ≥ 19]
AND [Challenge Index ≥ 1300]  □ OR [Challenge Index ≥ 1300]
AND ACCU Calculus Readiness ≥ 19]  □ OR ACCU Calculus Readiness ≥ 19]

Note: University specific pre-requisites are inconsistent with the system common course guidelines and receive approval only in rare circumstances.

☐ Co-Requisites

☐ Registration Restriction

☐ Addition/deletion of a lab/lecture component

If the addition of a lab/lecture component requires a change in pre-requisites or co-requisites, indicate below (add lines as needed, make sure to copy and paste format)

<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
<th>Pre-Req/Co-Req?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Choose an item.</td>
</tr>
</tbody>
</table>

Will the grade for this lab/lecture component be limited to S/U (pass/fail)?

☐ Yes  ☐ No
Will section enrollment for the lab/lecture component be capped?
☐ Yes, max per section: _________  ☐ No

☐ Course Content/Description change (write proposed new content/description below)

Note: Course descriptions are short, concise summaries that typically do not exceed 75 words. DO: Address the content of the course and write descriptions using active verbs (e.g., explore, learn, develop, etc.). DO NOT: Repeat the title of the course, layout the syllabus, use pronouns such as “we” and “you,” or rely on specialized jargon, vague phrases, or clichés.

☐ Course Deletion

Indicate the universities deleting the course:
☐ BHSU  ☐ DSU  ☐ NSU  ☐ SDSMT  ☐ SDSU  ☐ USD

Effective term of the change:  Fall 2022

2.2. Add justification for all changes noted above:

As part of its strategic enrollment program, in Fall 2021 South Dakota Mines launched MATH 116 Engineering Precalculus, a (4+1)-credit “mathematical bootcamp” course designed to make students who place into College Algebra (MATH 114) calculus-ready in a single semester by teaching core precalculus concepts and active study skills. As this course is explicitly geared towards students on the Calculus Math Pathway – and more specifically, to calculus for engineers and scientists at Mines – it would make enrollment easier for students who successfully pass MATH 116 to be able to directly enroll in MATH 123, without being immediately rejected by the Banner system.

We have written the other Mathematics Departments in the system, and they have expressed support for this change (documentation added After Section 4 below).

Section 3. Other Course Information

Will this course equate (i.e., be considered the same course for degree completion) with any other unique or common courses in the common course database (Course Inventory Report)?
☐ Yes  ☐ No

If yes, indicate the course(s) to which the course will equate (add lines as needed):
<table>
<thead>
<tr>
<th>Prefix &amp; No.</th>
<th>Course Title</th>
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(AAC Form 1.6 – Revised Course Request: Common Course (Substantive Modifications) (Last Revised 09/2020))
**Section 4. Department and Course Codes (Completed by University Academic Affairs)**

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☐ Change in University Department Code

☐ Change in Banner Department Code

☐ Change in [CIP Code]

☐ [CIP Code] to [CIP Code]

☐ [CIP Code] to [CIP Code]
Request for informal approval from other Mathematics Departments in the system

From: Kowalski, R. T. <travis.kowalski@sdsmt.edu>
Sent: Tuesday, September 28, 2021 1:44 PM
To: Siewert, Daluss <daluss.siewert@bhsu.edu>; Avery, Rich <rich.avery@dsu.edu>; Brownlee, Erin A <erin.brownlee@northern.edu>; Cogswell, Kurt <kurt.cogswell@sdstate.edu>; Van Peursem, Dan <Dan.VanPeursem@usd.edu>

Subject: MATH 123 prerequisite adjustment

Math colleagues,

As part of its Strategic Enrollment Plan, this semester (after a one-year delay due to COVID) South Dakota Mines offered a new “mathematical bootcamp” course called MATH 116: Engineering Precalculus designed to get students placed into College Algebra the math skills and the study skills needed to succeed in the Calculus sequence in a single semester (rather than the usual two-semester MATH 114+120 route). It covers essential topics and techniques from College Algebra and Trigonometry needed for Calculus I and II, and is linked with mandatory “study hall” times to help students with time management, active study, and (of course) further math practice.

One (obvious, in hindsight) hiccup of this plan is that MATH 123, being a common-numbered MATH course, has common, system-wide prerequisites. I would like to amend the current prerequisites for MATH 123 to be

MATH 115 or MATH 116 or MATH 120 or ( MathIndex 1300 + ACCU Calc Readiness 19) or
... (other currently listed placement routes)

Is this a request that your department/curriculum group/university would be willing to support?

I am happy to provide more information as requested.

Thank you for your consideration,
--Travis

University of South Dakota

From: Van Peursem, Dan <Dan.VanPeursem@usd.edu>
Sent: Tuesday, September 28, 2021 1:09 PM
To: Kowalski, R. T. <travis.kowalski@sdsmt.edu>; Siewert, Daluss <daluss.siewert@bhsu.edu>; Avery, Rich <rich.avery@dsu.edu>; Brownlee, Erin A <erin.brownlee@northern.edu>; Cogswell, Kurt <kurt.cogswell@sdstate.edu>

Subject: [EXT] RE: MATH 123 prerequisite adjustment

I have no objections.
Thanks
Dan
From: Cogswell, Kurt <Kurt.Cogswell@SDSTATE.EDU>
Sent: Tuesday, September 28, 2021 1:18 PM
To: Van Peursem, Dan <dan.vanpearesem@usd.edu>; Kowalski, R. T. <travis.kowalski@sdsmt.edu>; Siewert, Daluss <daluss.siewert@bhsu.edu>; Avery, Rich <rich.avery@dsu.edu>; Brownlee, Erin A <erin.brownlee@northern.edu>

Subject: [EXT] Re: MATH 123 prerequisite adjustment

Nor do I.
Kurt

Black Hills State University

From: Siewert, Daluss <Daluss.Siewert@bhsu.edu>
Sent: Tuesday, September 28, 2021 1:26 PM
To: Cogswell, Kurt <kurt.cogswell@sdstate.edu>; Van Peursem, Dan <dan.vanpearesem@usd.edu>; Kowalski, R. T. <travis.kowalski@sdsmt.edu>; Avery, Rich <rich.avery@dsu.edu>; Brownlee, Erin A <erin.brownlee@northern.edu>

Subject: RE: [EXT] Re: MATH 123 prerequisite adjustment

No objections here.
Daluss

Dakota State University

From: Avery, Rich <Rich.Avery@dsu.edu>
Sent: Tuesday, September 28, 2021 3:42 PM
To: Kowalski, R. T. <travis.kowalski@sdsmt.edu>; Siewert, Daluss <daluss.siewert@bhsu.edu>; Brownlee, Erin A <erin.brownlee@northern.edu>; Cogswell, Kurt <kurt.cogswell@sdstate.edu>; Van Peursem, Dan <dan.vanpearesem@usd.edu>

Subject: [EXT] RE: MATH 123 prerequisite adjustment

There shouldn’t be any issues with this, but I”ll confirm.

Rich Avery

From: Avery, Rich <Rich.Avery@dsu.edu>
Sent: Tuesday, September 28, 2021 4:45 PM
To: Palmer, Jeff <Jeff.Palmer@dsu.edu>; Wicklein, Richard <Richard.Wicklein@dsu.edu>

Subject: FW: MATH 123 prerequisite adjustment

I don’t see any reason to object – do you get to make these decisions or do we still go to the Provost? Hope all is well,

Rich
From: Palmer, Jeff <Jeff.Palmer@dsu.edu>
Sent: Wednesday, September 29, 2021 11:31 AM
To: Kowalski, R. T. <travis.kowalski@sdsmt.edu>
Cc: Siewert, Daluss <daluss.siewert@bhsu.edu>; Brownlee, Erin A <erin.brownlee@northern.edu>; Cogswell, Kurt <kurt.cogswell@sdstate.edu>; Van Peursem, Dan <dan.vanpeursem@usd.edu>; Avery, Rich <Rich.Avery@dsu.edu>

Subject: [EXT] FW: MATH 123 prerequisite adjustment

Hi Travis,

A couple of questions that some here have asked are 1) has this course already been approved as a new (General Education) course or was it just offered as an experimental course and 2) how is it different from Math 115?

Jeffrey S. Palmer

From: Kowalski, R. T.
Sent: Wednesday, September 29, 2021 11:57 AM
To: Palmer, Jeff <Jeff.Palmer@dsu.edu>

Subject: RE: [EXT] FW: MATH 123 prerequisite adjustment

Hi Jeff,

The answers to your questions are:

1) MATH 116 has been approved by AAC & BOR as a unique Mines course... however, the curriculum request treated it as a new course, rather than as a new General Education course. This is mostly because it didn’t occur to me to try and approve it as a system-wide GenEd course. We are currently running two sections of it this semester.

2) The overlap is large, but the three biggest differences are that (a) MATH 116 does not presume any College Algebra experience and instead develops this as part of the class, (b) MATH 116 covers fewer topics than 115, focusing particularly on simplification, solving, and graphing techniques for algebraic functions, trigonometric functions, and logarithms and exponentials that are critical to Calculus I and II, and (c) MATH 116 features an integrated lab that focuses on developing general collegiate study skills (time management, Cornell notes, active study methods, etc.).

Does that help?
--Travis

From: Palmer, Jeff <Jeff.Palmer@dsu.edu>
Sent: Thursday, September 30, 2021 12:05 PM
To: Kowalski, R. T. <travis.kowalski@sdsmt.edu>

Subject: RE: [EXT] FW: MATH 123 prerequisite adjustment

Thanks Travis – it all sounds good to me and I will pass the information along to those who had asked the questions.

Jeffrey S. Palmer
From: Palmer, Jeff <Jeff.Palmer@dsu.edu>
Sent: Tuesday, October 5, 2021 8:10 AM
To: Kowalski, R. T. <travis.kowalski@sdsmt.edu>
Cc: Kenley, David <David.Kenley@dsu.edu>; Hanson, Richard <Richard.Hanson@dsu.edu>; Avery, Rich
<Rich.Avery@dsu.edu>; Spanier, Mark <Mark.Spanier@dsu.edu>; Wicklein, Richard
<Richard.Wicklein@dsu.edu>; Jones, Kim <Kim.Jones@dsu.edu>; Altmann, Hannah
<Hannah.Altmann@dsu.edu>; Murphy, Kyle <Kyle.Murphy@dsu.edu>

Subject: [EXT] FW: MATH 123 prerequisite adjustment

Travis,

The mathematics faculty at DSU have discussed this proposed pre-requisite change (see below) and we have no objections.

Jeffrey S. Palmer

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Northern State University

From: Brownlee, Erin A <Erin.Brownlee@northern.edu>
Sent: Wednesday, September 29, 2021 7:35 AM

Subject: [EXT] Re: MATH 123 prerequisite adjustment

Northern has no objection to this change.

Erin