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| For Academic Affairs and Research Use Only | |
| Proposal Number | ECS23 |
| CIP Code: |  |
| Degree Code: |  |

**New or Modified Course Proposal Form**

**[X] Undergraduate Curriculum Council**

**[ ] Graduate Council**

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| --- |
| **[X]New Course, [ ]Experimental Course (1-time offering), or [ ]Modified Course (Check one box)** |

Signed paper copies of proposals submitted for consideration are no longer required. Please type approver name and enter date of approval.

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| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date… **Department Curriculum Committee Chair** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **COPE Chair (if applicable)** |
| Alexandr M. Sokolov 9/9/2021 **Department Chair** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **Head of Unit (if applicable)** |
| Jason Stewart 10/29/2021  **College Curriculum Committee Chair** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **Undergraduate Curriculum Council Chair** |
| Mary Elizabeth Spence 9/22/2021 **Office of Assessment (new courses only)** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **Graduate Curriculum Committee Chair** |
| Dr. Abhijit Bhattacharyya 10/29/2021 **College Dean** | Alan Utter 11/16/2021  **Vice Chancellor for Academic Affairs** |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **General Education Committee Chair (if applicable)** |  |

1. **Contact Person (Name, Email Address, Phone Number)**

Alexandr M. Sokolov

[asokolov@astate.edu](mailto:asokolov@astate.edu)

870-972-3635

1. **Proposed starting term and Bulletin year for new course or modification to take effect**

FALL 2022

**Instructions:**

*Please complete all sections unless otherwise noted. For course modifications, sections with a “Modification requested?” prompt need not be completed if the answer is “No.”*

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|  | **Current (Course Modifications Only)** | **Proposed (New or Modified)**  *(Indicate “N/A” if no modification)* |
| **Prefix** |  | **CM** |
| **Number\*** |  | **3003** |
| **Title** |  | **Construction Physics** |
| **Description\*\*** |  | **An introduction to the fundamental principles underlying classical physics and modern physics and the applications of those principles in construction and engineering.** |

***\**** (Confirm with the Registrar’s Office that number chosen has not been used before and is available for use. For variable credit courses, indicate variable range. *Proposed number for experimental course is 9*. )

\*\*Forty words or fewer as it should appear in the Bulletin.

1. **Proposed prerequisites and major restrictions** **[Modification requested? Yes/No]**

(Indicate all prerequisites. If this course is restricted to a specific major, which major. If a student does not have the prerequisites or does not have the appropriate major, the student will not be allowed to register).

1. YES Are there any prerequisites?
   1. If yes, which ones?

C or better in MATH 2143, Business Calculus or MATH 2204, Calculus I.

* 1. Why or why not?

This is an introduction course to Construction physics that requires calculus concepts to be successful.

1. No Is this course restricted to a specific major?
   1. If yes, which major? Enter text...
2. **Proposed course frequency [Modification requested? Yes/No]**

(e.g. Fall, Spring, Summer; if irregularly offered, please indicate, “irregular.”) *Not applicable to Graduate courses.*

Spring

1. **Proposed course type [Modification requested? Yes/No]**

Will this course be lecture only, lab only, lecture and lab, activity (e.g., physical education), dissertation/thesis, capstone, independent study, internship/practicum, seminar, special topics, or studio? Please choose one.

Lecture Only

1. **Proposed grade type [Modification requested? Yes/No]**

What is the grade type (i.e. standard letter, credit/no credit, pass/fail, no grade, developmental, or other [please elaborate])

Standard Letter

1. No Is this course dual-listed (undergraduate/graduate)?
2. No Is this course cross-listed?

*(If it is, all course entries must be identical including course descriptions. Submit appropriate documentation for requested changes. It is important to check the course description of an existing course when adding a new cross-listed course.)*

**a.** – If yes, please list the prefix and course number of the cross-listed course.

Enter text...

**b.** – **Yes / No** Can the cross-listed course be used to satisfy the prerequisite or degree requirements this course satisfies?

Enter text...

1. Yes Is this course in support of a new program?

a. If yes, what program?

Bachelor of Science in Construction Management

1. No Will this course be a one-to-one equivalent to a deleted course or previous version of this course (please check with the Registrar if unsure)?

a. If yes, which course?

Enter text...

**Course Details**

1. **Proposed outline** **[Modification requested?]**

(The course outline should be topical by weeks and should be sufficient in detail to allow for judgment of the content of the course.)

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| Week | Topic |
| 1 | Classical Mechanics |
| 2 | Electromagnetism |
| 3 | Vibrations and Momentum/ Conservation of Energy |
| 4 | Applied Thermodynamics |
| 5 | Structural & Materials Mechanics |
| 6 | Planar Motion |
| 7 | Construction Topics |

1. **Proposed special features** **[Modification requested? ]**

(e.g. labs, exhibits, site visitations, etc.)

No

1. **Department staffing and classroom/lab resources**

Engineering Management

1. Will this require additional faculty, supplies, etc.?

Yes, 1 additional faculty. Credit line already approved.

1. No Does this course require course fees?

*If yes: please attach the New Program Tuition and Fees form, which is available from the UCC website.*

**Justification**

**Modification Justification (Course Modifications Only)**

1. Justification for Modification(s)

Enter text...

**New Course Justification (New Courses Only)**

1. Justification for course. Must include:

a. Academic rationale and goals for the course (skills or level of knowledge students can be expected to attain)

Construction management professionals need Construction Physics to understand the concepts of physics and how materials will interact with each other. This can also be helpful when selecting the proper materials to use on job sites. Understanding how physics can affect different aspects of construction and materials is critical to ensure construction managers build buildings correctly and safely for people to use. By understanding how physics of motion or mechanics create stress to structures, engineers can build safer and stronger systems that will be sustainable. Students who do not properly understand how physics is used in construction will lead to unsafe and unreliable construction management practices that could cost a lot of money, time, and safety.

b. How does the course fit with the mission of the department? If course is mandated by an accrediting or certifying agency, include the directive.

This is important because the construction field is always changing as new materials are being invented and introduced. By understanding how physics impacts building construction practices, students are better able to positively impact construction practices and increase the safety and efficiency of building processes. These factors positively impact and support the mission of A-State, the College of Engineering and Computer Science, and the department.

c. Student population served.

Targeted for students in the BSCM and available for other majors

d. Rationale for the level of the course (lower, upper, or graduate).

This course builds on the general elective requirements and calculus concepts to ensure students have all the aptitude to be successful.

**Assessment**

**Assessment Plan Modifications (Course Modifications Only)**

1. **Yes / No** Do the proposed modifications result in a change to the assessment plan?

*If yes, please complete the Assessment section of the proposal*

**Relationship with Current Program-Level Assessment Process (Course modifications skip this section unless the answer to #18 is “Yes”)**

1. What is/are the intended program-level learning outcome/s for students enrolled in this course? Where will this course fit into an already existing program assessment process?

3. An ability to develop and conduct experiments or test hypotheses, analyze and interpret data and use scientific judgment to draw conclusions.

1. Considering the indicated program-level learning outcome/s (from question #19), please fill out the following table to show how and where this course fits into the program’s continuous improvement assessment process.

*For further assistance, please see the ‘Expanded Instructions’ document available on the UCC - Forms website for guidance, or contact the Office of Assessment at 870-972-2989.*

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| **Outcome 3** | An ability to develop and conduct experiments or test hypotheses, analyze and interpret data and use scientific judgment to draw conclusions. |
| Assessment Measure | Direct: Project/tests will be assessed with a Rubric; Indirect: Exit Survey |
| Which courses are responsible for this outcome? | CM 3023 Strategic Bidding and Estimating |
| Assessment  Timetable | Collect data whenever course is offered. But assess every 3 years as the College of Engineering and Computer Science Assessment schedule. |
| Who is responsible for assessing and reporting on the results? | The course instructor, Program coordinator, and the Program Director |

*(Repeat if this new course will support additional program-level outcomes)*

**Course-Level Outcomes**

1. What are the course-level outcomes for students enrolled in this course and the associated assessment measures?

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| **Outcome 1** | Use knowledge of physics gained in the course to understand and emphasize why certain materials and methods are used in the field. |
| Which learning activities are responsible for this outcome? | Students will need to present their newly gained knowledge through use of projects or exams to showcase an understanding of high-level construction physics that will show they will be responsible construction managers when they graduate. |
| Assessment Measure | Project/exam grade with scoring rubric |

*(Repeat if needed for additional outcomes)*

**Bulletin Changes**

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| **Instructions** |
| **Please visit** [**http://www.astate.edu/a/registrar/students/bulletins/index.dot**](http://www.astate.edu/a/registrar/students/bulletins/index.dot) **and select the most recent version of the bulletin. Copy and paste all bulletin pages this proposal affects below. Please include a before (with changed areas highlighted) and after of all affected sections.**  **\*Please note: Courses are often listed in multiple sections of the bulletin. To ensure that all affected sections have been located, please search the bulletin (ctrl+F) for the appropriate courses before submission of this form.** |

Course Descriptions to be added at page 480 in the 2021-2022 Undergraduate Bulletin.

**Construction Management (CM)**

**CM 3003, Construction Physics** An introduction to the fundamental principles underlying classical physics and modern physics and the applications of those principles in construction and engineering. Prerequisite, C or better in MATH 2143, or MATH 2204. SPRING.

**CM 3013, Green Construction** Overview of design and construction delivery systems for high performance green buildings; relevant criteria and established guidelines; green standards; high performance green buildings and sustainability; vocabulary associated with sustainability and green buildings; physical limitations of materials. FALL.

**CM 3023, Strategic Bidding and Estimating** Theory and practice of construction project bidding and estimating. Review of all bid-preparation activities from a contractor’s organization from the initial decisions on project selection and receipt of drawings and specifications, through the estimating process and necessary follow-up actions. SPRING.

**CM 3033, Architectural CAD** Introduction to principles of graphic tools and CAD systems in architecture and construction fields. Application of CAD in creation of floor plans, foundation plans, roof design, section details, and elevation drawings. FALL.

**CM 3043, Structural Blueprints** Basic principles of print reading. Topics include line types, orthographic projections, dimensioning methods, and notes. Upon completion, students should be able to interpret basic prints and visualize the features of a part or system. Prerequisite, C or better in CM 3033. SPRING.

**CM 3053, Building Information Modeling (BIM)** Utilizing basic functions of Building Information Modeling (BIM) for residential and commercial construction. During the course, students will examine geometry, spatial relationships, geographic information, quantities, and properties of building components. Prerequisite, C or better in CM 3033. SPRING.

**CM 4003, Construction Management Design I** Multidisciplinary group work on a design problem from conceptualization through selection of best alternative. A project proposal is required. Prerequisite, C or better in MATH 2143, Business Calculus or MATH 2204, Calculus I. FALL.

**CM 4013, Construction Management Design II** Group work to complete final design and testing aspects of a senior design project. A public oral presentation is required. Prerequisite, C or better in CM 4003. SPRING.

**CM 4023, Materials and Methods for Construction** Introduction to specifications, standards, codes, quality control, and quantity survey as they pertain to the execution of selected construction materials. Topics include site work, concrete, masonry, steel, rough and finish carpentry, thermal and moisture protection, doors, windows, finishes, and specialties. Prerequisite, C or better in CM 3003. FALL.

**CM 4063, Construction Management Internship** Practical experience in construction management. Evaluation and reports required. Prerequisite, Program Director approval. FALL & SPRING.