

**South Dakota School of Mines and Technology**  
**Department of Materials and Metallurgical Engineering**

**MET 352: PRINCIPLES OF METALLURGICAL DESIGN**  
**COURSE SYLLABUS**  
**Spring 2019**

**Instructor**

Dr. Stanley M. Howard  
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Office Hours: Weekdays 1:00-5:00 pm or by appointment.

**Course Description**

MET 352 – Principles of Metallurgical Design; (2-0) Credits  
Prerequisites: MET 320, MET 232, MET 220

Introduction to the principles of engineering design as applied in the field of Metallurgical Engineering. The main focus will be Systems Engineering principles, teamwork, project management, technical communications, and materials and process selection as they relate to Metallurgical Engineering.

**Class Schedule**

MET 352 classes will meet Wednesday and Friday 3:00-3:50 am in MI 222.

**Course Website**

<http://www.hpcnet.org/MET352spring2018>

**Textbook**

ENGINEERING DESIGN, George E. Dieter, Linda Schmidt, McGraw-Hill Company, Fifth Edition, 2012.  
(optional)

**Required/Elective**

Met 352 is required for all B.S. Metallurgical Engineering students.

**Course Outcomes**

The objectives of this course are to introduce students to the engineering design process and provide hands on practical experience on Metallurgical Engineering Design. Students will complete modest design projects while working in a team environment under the supervision of one or more faculty mentors. During the semester students will demonstrate the ability to

- Define an engineering problem and establish project requirements and constraints.
- Gather information and establish the state of the art on the design science and technology.
- Conceptualize multiple solutions to a design problem.
- Use decision matrices for the selection of a candidate solution.
- Establish a candidate design and the tasks needed to achieve this design.
- Establish a project schedule.
- Work effectively in a team environment.
- Write progress and final design reports.
- Make effective oral presentations.
- Integrate knowledge and apply common analytical tools from metallurgical engineering courses.
- Manage the project effectively using a project schedule and other management tools.
- Develop and implement appropriate and detailed manufacturing plans.
- Write progress and final design reports, incorporating ethical, environmental, and societal issues pertinent to the project.
- Test and evaluate prototype performance.

## MET 352: PRINCIPLES OF METALLURGICAL DESIGN

<b>Grading</b>	<b>Approximate Points</b>
Assignments, presentations	120
Participation	80
Daily short response	40
Final Report(s)	<u>100</u>
	300

The final grade is based directly on the total points achieved. There is no additional weighting. On rare occasions a student's grade may be raised (but never lowered) for subjective considerations such as an excellent homework file. The final grade section average is normally between 2.75 and 3.25.

### **Attendance Policy**

Attendance for this course is required. Excused absences: If students must miss class for a school sponsored event or other valid reason they should inform the instructor, their group advisor and their teammates in advance. Unexcused absences: Students with three or more unexcused absences will lose 10% from their final course grade and an additional 10% for each additional three absences (e.g. six absences will result in a loss of 20% from the course grade).

### **Late Policy**

Any assignment not received by the due date will receive zero credit. Students should proactively notify the instructor of any issues that arise during the semester that may result in a missed deadline. The student must take the initiative to meet with the instructor to arrange for bona-fide-absence makeup work. Failure to make arrangements at the soonest possible available time will terminate the opportunity to submitted makeup work.

**Final Exam:** TBD

### **Student Integrity and Professionalism**

Copying, plagiarism, or other academic dishonesty will not be tolerated. Students should also consult the policies for academic misconduct located in the SD Mines Student Handbook under Community Standards. Students are expected to conduct themselves professionally.

### **Electronic Devices Policy**

Please turn off your cell phone before class starts. No text messaging in class. No headphones. If you wish to use a laptop in this class for purposes of note taking, you may, but use of laptop is restricted to note taking and as such the laptop must be in the screen facing up note taking position. No other use of any other electronic/computer media is allowed during class time, unless required by the instructor during class.

### **Special Needs**

Students with special needs or requiring special accommodations should contact at their earliest opportunity either, or both

- 1) Instructor, Dr. Stanley M. Howard, at MI 114, [Stanley.Howard@sdsmt.edu](mailto:Stanley.Howard@sdsmt.edu), or 394-1282
- 2) Title IX and Disability Coordinator, Ms. Nancy Sprynczynatyk, [Nancy.Sprynczynatyk@sdsmt.edu](mailto:Nancy.Sprynczynatyk@sdsmt.edu) or 394-2533.

### **Archiving Assignments and Examinations**

Some students may be asked to submit copies of their assignments and examinations for the departmental archival system for ABET evaluations. All submitted information is confidential.

### **Freedom in Learning**

Under Board of Regents and University policy student academic performance may be evaluated solely on an academic basis, not on opinions or conduct in matters unrelated to academic standards. Students should be free to take reasoned exception to the data or views offered in any course of study and to reserve judgment about matters of opinion, but they are responsible for learning the content of any course of study for which they are enrolled.

## **MET 352: PRINCIPLES OF METALLURGICAL DESIGN**

Students who believe that an academic evaluation reflects prejudiced or capricious consideration of student opinions or conduct unrelated to academic standards should contact the Provost and Vice President for Academic Affairs to initiate a review of the evaluation.

### **Communications with the Instructor**

Students are welcome to call the professor at 394-1282 to discuss course matters or to confirm same-day face-to-face meeting times. All digital communications should be via email to [Stanley.howard@sdsmt.edu](mailto:Stanley.howard@sdsmt.edu) unless otherwise directed. Students should assume that the instructor will neither see nor respond to social media communications.

### **Policies**

- Students who are ill should not attend class or enter the MI Building. Use email and the telephone.
- All exam and assignment sheets provided by the instructor MUST be turned in on top of each exam/assignment.
- All homework must be kept in a bound notebook available for inspection.
- Students who wish to be excused should email the instructor or leave a message at 394-1282 before the absence. Excuses are allowed for sickness, emergencies, special events, etc. Students who were unable to call before the absence occurred should discuss the absence with Dr. Howard if they want to be considered for an excused absence.
- Excused absences from daily quizzes/responses will result in the assignment of an estimated grade for the missed quiz/response. Unexcused absences will result in a zero. No scores are thrown out.
- Students who return from an excused absence may elect to write a one-paragraph summary on the missed day's classroom activity in lieu of taking the short quiz/response the day of their return to class. This is to be submitted the class day after their return to class.
- Short quizzes/response will usually cover material from the previous class room exercise or lecture.
- Students who miss an exam for an excused reason will be given a make-up exam, but it will probably be more difficult and longer than the missed exam. Students are expected to take makeup exams within three days after their return from an excused absence.
- Dr. Howard has an open-door policy. His schedule is posted on the door to MI114. Students are welcome to call Dr. Howard at 394-1282 or email him at [stanley.howard@sdsmt.edu](mailto:stanley.howard@sdsmt.edu). Appointments are discouraged unless there is a significant reason to make one. The 30-minute period before an exam is generally not a good time to ask questions since it is reserved for exam writing and printing.

### **Laboratory**

None, but elements of design work require some lab-like time commitments with the design team. These most often take the form of effort spent in the departmental laboratories working to complete elements of a design project.

### **Contribution of course to meeting the professional component**

- This course prepares students in the basics of capstone design experience..
- Ethical and professional conducts are emphasized throughout the.

### **Expectations**

College Calculus, Chemistry, Physics

### **Computer Usage**

Microsoft Word®, Excel®, Visio®, and Project®