Classroom:	C-303
Day/Time of course:	MWF 12:00-12:50 p.m.
Instructor:	Dr. Jason Hower
E-mail:	Jason.Hower@sdsmt.edu
Phone:	394-2627
Office:	EEP-119
Office Hours:	MWF 2pm – 3pm I have an open door policy and will often be able to see you at other times. For appointments outside of office hours please email me or contact me in my office.
Prerequisite:	Math 321, senior standing.
Required Textbook:	Principles and Practice of Automatic Process Control, by C. A. Smith and A. B. Corripio, John Wiley & Sons, New York, (2006).
Catalog Description:	(3-0) 3 credits. Prerequisite: MATH 321 and senior standing. Analysis and design of process control systems for industrial processes, including controller tuning and design of multivariable control schemes. This course is cross-listed with MET 433.
Course Objectives:	The objective of this course is to provide students with a working knowledge required to understand and solve practical problems which require: 1. Process dynamic analysis; 2. Basic process-control theory.
Instructional Methods:	This course utilizes lectures, reading assignments, class exercises, homework problems, quizzes, and examinations as methods of instruction and assessment.

Student Learning Outcomes:

After completion of this course the average student is expected to be able to:

1. Model the dynamic behavior of physical processes and automatic control systems using algebraic and differential equations, and by using block diagrams representing the Laplace transforms of those equations.
2. Tune feedback controllers to produce a desired mode of response.
3. Identify and sketch graphs illustrating overdamped, critically damped, underdamped, undamped and unstable systems, and predict which response will occur based on the transfer functions describing a system.
4. Model complex process behavior using empirical first-order-plus-dead-time models, and tune automatic controllers based on those process models.
5. Illustrate control techniques and response modes using simulation software.
6. Explain advanced control techniques of feed-forward and cascade control using block diagrams, process and instrumentation diagrams, and time-domain graphs.
7. Explain and use concepts of statistical process control, including statistics of central tendency and variability, control charts, and hypothesis testing.

Evaluation:
Assignments and exams will be graded for technical correctness, as well as for professional quality. Final letter grades will be based directly on the total points earned in the course. The total score will be based on the points earned in each course activity and weighted as follows:

Quizzes, approx. fortnightly	60%
Homework, approx. weekly	10%
Final Exam, cumulative	30%

Final Letter grades will be assigned based on each student's percentage of the total points earned in the course as follows:

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

I reserve the right to shift the grade ranges as I see fit to reflect the difficulty level of the course.

Homework and quizzes: Homework problems will be assigned and collected, but may or not may not be graded. Please have your homework ready to turn in at the beginning of class. Homework should be completed on one-side of engineering-style paper. All submitted work must be clean, readable, logically sound and prepared as if any CBE professional could grade even without the problem or text. All assumptions must be clearly stated. When appropriate, the solution should include a sketch and a clearly presented solution method. More credit will be given to the correct solution path/plan/method than the final numerical answer.

You will be allowed to drop your lowest homework and quiz score. Therefore, no late homework will be accepted and no make-up quizzes will be given. Unless assignments are specified as being team assignments, individual work is expected. This is not meant to preclude students helping each other, but no copying. Quizzes are always to be completed individually.

Absences:

a) Students who miss a class should arrange to get notes from one of their classmates.
b) If you know you are going to be absent, contact the instructor as early as possible to arrange for makeup work.

Topics: (Below is a list of tentative topics to be covered from the book. This list may change as the course progresses.)

- Feedback control
- Control algorithms
- P & IDs
- Laplace transforms
- 1st order processes
- 2nd order processes
- Block diagrams
- P, PI, PID control
- Tuning controllers
- Dead-time
- Tuning formulas
- Advanced control (feedforward, cascade)
- Statistical process control

Students with special needs or requiring special accommodations should contact the instructor at 394-1235 and/or the campus ADA coordinator, Ms. Jolie McCoy, at 394-1924 at the earliest opportunity.

Students are responsible for learning the content of any course of study in which they are enrolled. Under Board of Regents and University policy, student academic performance shall be evaluated solely on an academic basis and students should be free to take reasoned exception to the data or views offered in any course of study. Students who believe that an academic evaluation is unrelated to academic standards but is related instead to judgment of their personal opinion or conduct should contact the dean of the college which offers the class to initiate a review of the evaluation.

Academic Dishonesty

In accordance with the Board of Regents and University policy, academic dishonesty will not be tolerated. Please read Policy Governing Academic Integrity (pg 60-61) in the 2000-2010 Undergraduate and Graduate Catalog. Cheating is a serious offense and completely unacceptable in our department and professional field. As practicing chemical engineers, you will be responsible for choices, designs, and calculations that directly impact human safety and well being. Therefore, YOU must demonstrate not only the technical ability to perform such work, but also the ethical quality that suggests you are deserving of such responsibility. Unless assignments are specified as being team assignments, individual work is expected. This is not meant to preclude students helping each other, but outright copying is not allowed and will be penalized. Quizzes or exams are always to be completed individually.

In this class academic dishonesty will include, but is not limited to, the following:

- Presenting another person's work or ideas as your own
- Copying another person's work or ideas
- Inappropriate use of outside resources without express permission of the instructor
- Unethical behaviors such as lying, cheating, and plagiarism

If you are caught breaking the ethical code of this class, or violating the academic dishonesty policy you will at the very least receive no credit for the assignment in question. Should the behavior continue, or the single event is severe enough, you will be removed from this course, this department, and even this university. I take cheating very seriously and will not hesitate to use all resources available to me to prevent and punish this inexcusable behavior. Should you find yourself in a position where cheating appears to be your only option, come see me; I am sure we can find a much better solution to the problem.