B.2 Evaluation of the Candidate’s Teaching and Advising

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B.2.1 Teaching Statement

A few years back, the University of St. Thomas had a clever aphorism on billboards advertising their school:

The professors at St. Thomas know something that those at UMN don’t . . . your name.

Indeed, with large class sizes and faculty consumed by research, why should the best and brightest students from the state enroll at UMN instead of a teaching institution like St. Thomas? And conversely, why should preeminent scholars at a research institution like UMN be distracted by the task of teaching unappreciative undergrads?

The simple answer is that the research activities at a top-tier university like UMN shape its teaching in critical ways. Its mission to teach gives it permanent footing in society, ensuring that its research activities continue to serve the greater good. This is the American model of higher learning and research, and it is the envy of the world.

It is true that with undergraduate class sizes of up to 80 students, I cannot claim that I have known all (or even most) of the names. However, in every class that I have taught at UMN, I have found there to be motivated and exceptional students – indeed, research-caliber students. My level of engagement with such students has gone far beyond teaching and grading: I have recruited 18 students from my undergraduate classes into UROP, Senior Honors, and Directed Study projects. With these students, I have published eight conference and journal papers, all in competitive venues. Six of the students that I have mentored have enrolled in Ph.D. programs at UMN and at other top schools.

Even students who do not get engaged in research activities benefit. When teaching at any level, from introductory courses on digital circuit design to interdisciplinary graduate-level courses, I bring a research perspective to the material. Certainly, I strive to cover the latest, leading-edge concepts and design techniques. However, I feel that it is also important to point out what is not known – for instance, the open problems and the ongoing research in the field. Otherwise, students may get the impression that they are learning by rote subjects that are complex, but about which everything is known. Such mistaken impressions are easily formed when it comes to digital circuits.

Everyone marvels at integrated circuit technology. Semiconductor manufacturing produces transistors that are only a few nanometers in size that switch at a rate of many billion times a second. But the true marvel of the technology is not in the manufacturing; rather it is the scale
of the design effort that should astonish us. A microprocessor consists of billions of transistors, shuffling around hundreds of millions of “zeros” and “ones” to compute truly complex functions. Verifying the behavior of such a circuit, let alone designing it, would seem like an intractable problem. Circuit designers have succeeded in this endeavor through progress in design automation tools: software that optimizes and synthesizes the circuitry automatically.

The reality is that the best way of arranging logic gates to compute even simple functions is unknown. As a lab project, I give students some simple circuits to feed as inputs to computer-aided design packages. Comparing the outputs to circuits that have been designed by experts, they can quickly judge how far from optimal the results are. There is ample scope for radical new ideas in how to design circuits at the logic level. When manufacturing hits inevitable physical limits, this is where progress will come from, I believe.

In addition to trying to get the students to think outside the box when it comes to conventional electronic circuitry, I also try to get them to think about novel types of circuitry. Largely through evening “pizza seminars” and 15-minute, end-of-lecture “one more thing” segments in classes, I try to expose the students to exciting research in biological circuit design and in molecular computing. Just as electronic systems implement computation in terms of voltage (energy per unit charge), molecular systems compute in terms of molecular concentrations (molecules per unit volume). For electronics, we have design methodologies that involve abstractions, modularity, and optimization. The same requirements exist in synthetic biology: designers need to build models, analyze and optimize them, and synthesize them into substrates such as E. coli or yeast. I teach the students techniques for implementing a variety of computational constructs with molecular reactions such as logic, memory, arithmetic, and signal processing.

At the graduate level, I have developed a new course EE 5393 “Circuits, Computation, and Biology.” Offered for the third time in Spring 2011, the course is very popular: the enrollment was over 80 students in Spring 2011, a record for this sort of graduate-level class. It explores connections between engineering concepts – circuit theory, digital computation, and distributed computing in particular – and biological systems. It is aimed at a wide audience: graduate students and upper-level undergraduates from engineering, computer science, mathematics, biology, and the life sciences. No prior knowledge of engineering or biology is assumed. While the course investigates a variety of topics from disparate fields, it does not attempt to survey the research exhaustively. Rather, it strives for depth and mathematical rigor in select areas.

The course also touches upon broader and less technical topics. I attempt a cursory survey of the landscape of interdisciplinary research as it might be seen through the wide lens of public interest in science. I discuss the ethical and security concerns swirling around research in synthetic biology; the social climate of research in biology vs. engineering vs. mathematics; and the study of circuit design practices as a window into the potential achievements and limitations of human cognition.

B.2.2 Postdoctoral Mentoring

   Project: “Data-Driven Modeling and Synthesis of Biological Networks”

   Vishwesh applied for a Postdoctoral position in my group. Given his previous position as an Assistant Professor at the Indian Institute of Technology, Bombay, he has been given the title “Visiting Research Professor” in Electrical and Computer Engineer at the University of Minnesota. I am funding Vishwesh through my NSF CAREER Award.

   Vishwesh’s project entails research in nonlinear stability analysis of metabolic networks and
construction of synthetic biological networks. He is also working on combinatorial library design optimization problems. He has applied developed novel synthetic oscillators in gene networks, and he has applied constrained optimization to the problem of maximizing the growth in populations of yeast cells. Since he has joined the University of Minnesota, Vishwesh and I have authored three papers together. He presented our work at the Allerton Conference on Communication, Control, and Computing in September.

B.2.3 Ph.D. Students Advised

1. **Weikang Qian**, Ph.D., July 2011

   Dissertation title: “Synthesizing Logical Computation on Stochastic Bit Streams”

   Weikang was my first Ph.D. student. I recruited him directly from Tsinghua University in 2006. He completed his Ph.D. degree this year. I have funded him through a grant from the Functional Engineered Nano-Architectonics (FENA) program and from my NSF CAREER Award. In the spring, Weikang interviewed for faculty positions at a number of schools, including a tenure-track position at the University of Southern California. He accepted a tenure-track position as an Assistant Professor at the new University of Michigan – Shanghai Jiao Tong University Joint Institute (SJTU), starting in September, 2011. SJTU is one of the top universities in China.

   Among the various honors, Weikang received a Doctoral Dissertation Award, a university-wide fellowship at the University of Minnesota. His paper “The Synthesis of Combinational Logic to Generate Probabilities” was nominated for the IEEE/ACM William J. McCalla Best Paper Award at the International Conference on Computer-Aided Design (ICCAD). His paper “The Synthesis of Robust Polynomial Arithmetic with Stochastic Logic” was nominated as a Research Highlight by Communications of the ACM.

   In his dissertation work, Weikang has forged a new paradigm for digital computation based on stochastic bit streams. The computation has a pseudo analog character, reminiscent of computations performed by physical systems such as electronics on continuously variable signals such as voltage. However, the variable signal is the probability of obtaining a one in a stochastic yet digital bit stream. Indeed, the system is built from ordinary, cheap digital electronics such as CMOS. It is truly creative work, with potentially important practical applications.

   Weikang’s best work is still to come. As a faculty member at the University of Michigan/SJTU, he will quickly assume his position as the top researcher in the field of stochastic circuit design.

2. **Mustafa Altun**, Ph.D. expected in 2012

   Dissertation title: “Synthesizing Logical Computation in Nanoscale Switching Lattices”

   I recruited Mustafa in 2008. He was a top student at the Technical University of Istanbul. I have funded him through a grant from the Functional Engineered Nano-Architectonics (FENA) program and from my NSF CAREER Award. For his dissertation, Mustafa is developing a novel synthesis technique for implementing robust digital computation in nanoscale lattices with random interconnects: percolation theory on random graphs. The technique exploits the non-linearity that occurs through percolation to produce Boolean functionality. He has two papers at the Design Automation Conference (DAC), the most prestigious venue for research in electronic circuit design automation. He has published his work in the IEEE Transactions on Computers.
3. **Hua Jiang**, Ph.D. expected in 2012  
Dissertation Title: “Digital Logic with DNA”  
I have been supervising Hua since 2009, jointly with Keshab Parhi. For his dissertation, he has been developing a strategy for implementing digital logic with molecular reactions. Based on a bistable mechanism for representing bits, he implements a constituent set of logical components, including combinational components such as AND, OR, and XOR gates, as well as sequential components such as D latches and D flip-flops. Using these components, he builds full-fledged digital circuits such as binary counters and linear feedback shift registers. Also, under Keshab’s tutelage, Hua has been developing a strategy for implementing signal processing with molecular reactions, including operations such as filtering. He has demonstrated robust designs for both Finite-Impulse Response (FIR) and Infinite-Impulse Response (IIR) filters.

Hua has papers at the Design Automation Conference (DAC) and at the International Conference on Computer-Aided Design (ICCAD), the two top conferences in computer-aided design. He presented his work at the IEEE International Workshop on Signal Processing Systems (SiPS) and at the International Conference on DNA Computing. He will present his work at the Asilomar Conference on Signals, Systems, and Computers in November.

His work formed the basis of a $400,000 grant that Keshab and I have been awarded from the NSF BIO Computing Program, for a project titled “Digital Signal Processing with Biomolecular Reactions.”

4. **John Backes**, Ph.D. expected in 2013  
Dissertation title: “Logic Synthesis Algorithms Based on Boolean Satisfiability”  
I met John in his sophomore year at the University of Minnesota, while teaching EE 2301 “Introduction to Digital Design” in 2006. I recruited him to do a UROP project; then funded him to do research for the summer; and then supervised his Senior Honors Project.

By the time he graduated from the B.S. program in 2008, John had already authored three papers, including a paper at the International Conference on Computer-Aided Design (ICCAD). When he formally enrolled in the Ph.D. program in 2008 he was already a full-fledged member of my research group (an “honorary Ph.D. student,” as it were).

John’s dissertation research is on novel algorithms and data structures for logic synthesis based on heuristics for Boolean Satisfiability and Craig Interpolation. I have been funding him through a grant from the Functional Engineered Nano-Architectonics (FENA) program and from my NSF CAREER Award.

**B.2.4 Master’s Theses Directed**

I have advised the following students for their thesis-based Master’s degrees:

- **Brian Fett** (2006–2008)  
  Thesis title: “Synthesizing Stochasticity with Biochemical Reactions”

  Thesis title: “Stochastic Transient Analysis of Biochemical Systems”
B.2.5 Undergraduate Mentoring

I have mentored the following students in projects through the Undergraduate Research Opportunities Program (UROP):

- Nick Gunderson (2011)
- Jing Xiong (2010)
- Aleksandra Kharam (2010)
- Joshua Krist (2010)
- Phillip Senum (2010)
- Phil Greenberg (2009)
- Dan Hudrlik (2009)
- Kathleen Thurmes (2009)
- John Backes (2008)
- Adam Shea (2008)

I have directed Senior Honors projects for:

- Theerachai Chanyaswad (2011–2012)
- Phil Greenberg (2010–2011)
- Caitlin Race (2010–2011)
- Tim Pankratz (2006–2007)
- Jason Heebl (2006–2007)

Four of these students have published peer-reviewed conference and/or journal papers as undergraduates:

2. Aleksandra Kharam: papers at ICCAD (2010), and at PSB (2011)
3. Adam Shea: papers at IWLS (2009), at ICCAD (2009) and at PSB (2010)
B.2.6 Courses Taught

My teaching evaluations for both undergraduate and graduate-level courses have been uniformly excellent. Across all the courses that I have taught, the average response to the summary questions has been:

a. “Would you recommend this instructor to other students?”  Yes, 95.1%
b. “Would you recommend this course to other students?”  Yes, 95.3%

(Arithmetic mean, with the average response for each course taught weighted equally.)

Lecture-Based Courses

I have taught freshman (1000-level), sophomore (2000-level), and graduate (5000- and 8000-level) courses. The average responses to the summary questions in the evaluations are as follows.

- EE 5393 “Circuits, Computation, and Biology,” Spring 2011 (81 students):
  a. “Would you recommend this instructor to other students?”  Yes, 97%
b. “Would you recommend this course to other students?”  Yes, 89%

- EE 5393 “Circuits, Computation, and Biology,” Fall 2008 (10 students):
  a. “Would you recommend this instructor to other students?”  Yes, 100%
b. “Would you recommend this course to other students?”  Yes, 100%

- EE 5393 “Circuits, Computation, and Biology,” Spring 2008 (15 students):
  a. “Would you recommend this instructor to other students?”  Yes, 100%
b. “Would you recommend this course to other students?”  Yes, 100%

- EE 1301 “Introduction to Computing Systems,” Fall 2010 (65 students):
  a. “Would you recommend this instructor to other students?”  Yes, 91%
b. “Would you recommend this course to other students?”  Yes, 88%

- EE 1301 “Introduction to Computing Systems,” Spring 2010 (54 students):
  a. “Would you recommend this instructor to other students?”  Yes, 86%
b. “Would you recommend this course to other students?”  Yes, 94%

- EE 1301 “Introduction to Computing Systems,” Fall 2009 (60 students):
  a. “Would you recommend this instructor to other students?”  Yes, 100%
b. “Would you recommend this course to other students?”  Yes, 96%

- EE 2301 “Introduction to Digital System Design,” Spring 2009 (35 students):
  a. “Would you recommend this instructor to other students?”  Yes, 96%
b. “Would you recommend this course to other students?”  Yes, 100%

- EE 2301 “Introduction to Digital System Design,” Spring 2008 (73 students):
  a. “Would you recommend this instructor to other students?”  Yes, 91%
b. “Would you recommend this course to other students?”  Yes, 96%
Prior to 2008, evaluations were in a different format; these summary questions were not asked.

- EE 2301 “Introduction to Digital System Design,” Spring 2007 (55 Students)
- EE 5950 “Special Topics in EE,” Fall 2006 (13 Students)

**Discussion Sections**

- EE 2301 “Introduction to Digital System Design,” Fall 2006, Fall 2007, Fall 2008, Fall 2009, and Fall 2010
- EE 2361 “Introduction to Microcontrollers,” Fall 2011

**Project-Based Courses**

- IT 1311 “Freshman Design,” Fall 2006
B.2.7 Sampling of Student Evaluations

The full set of student course evaluations are included in the dossier. (In total, there are over 500 evaluation forms for the courses that I have taught since 2006.) What follows is a sampling of the written comments, spanning all the courses.

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**University of Minnesota Student Rating of Teaching**

INSTRUCTOR: **MARC RIEDEL**

TERM: **SPRING 2011**

DEPARTMENT: **ECE**

COURSE #: **5293 (EE)**

Section:

Carefully read each statement and select a response based on the following: 6-Strongly Agree 5-Agree 4-Somewhat Agree 3-Somewhat Disagree 2-Disagree 1-Strongly Disagree

1. The instructor was well prepared for class.
2. The instructor presented the subject matter clearly.
3. The instructor provided feedback intended to improve my course performance.
4. The instructor treated me with respect.
5. I have a deeper understanding of the subject matter as a result of this course.
6. My interest in the subject matter was stimulated by this course.

---

**Written Comments**

1. What did the instructor do that most helped your learning?
   
   *PRESENTED THE MATTER VERY CLEARLY STEADILY*

2. What could you have done to be a better learner?
   
   *DONE MORE WORK BEFORE EVERY LECTURE*

---

(Please use other side for additional comments.)

To preserve anonymity in small classes, the demographic section below will be cut off before the forms are returned to the instructor. Additionally, summary reports will not be sent to the instructor for any category containing fewer than five students.

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8
**University of Minnesota Student Rating of Teaching**

Your responses to this questionnaire are important because they will be used in tenure, promotion, and salary decisions for your instructor. Your thoughtful written comments are especially requested, and may help your instructor improve future course offerings. The results of this evaluation (including the evaluation forms) will not be returned to the instructor until after the final grades are submitted for this course. In addition to a No. 2 pencil, you may use a blue or black pen to complete this form. Completely fill in the oval of your choice. If you erase, erase completely. Multiple marks will result in the answer being omitted from the results.

**INSTRUCTOR:** Marc Riedel  
**TERM:** Fall  
**CURRENT YEAR:** 2019  
**DEPARTMENT:** EE  
**COURSE #:** 1301  
**SECTION:**

**Carefully read each statement and select a response based on the following:**  
6-Strongly Agree 5-Agree 4-Somewhat Agree 3-Somewhat Disagree 2-Disagree 1-Strongly Disagree

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Somewhat Agree</th>
<th>Somewhat Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The instructor was well prepared for class.</td>
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<tr>
<td>2. The instructor presented the subject matter clearly.</td>
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<tr>
<td>3. The instructor provided feedback intended to improve my course performance.</td>
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<tr>
<td>4. The instructor treated me with respect.</td>
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<tr>
<td>5. I have a deeper understanding of the subject matter as a result of this course.</td>
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<tr>
<td>6. My interest in the subject matter was stimulated by this course.</td>
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</table>

**Written Comments**

1. What did the instructor do that most helped your learning?
   
   He had prep sessions that would go over what was exactly going to be on the quiz.

2. What could you have done to be a better learner?
   
   Studied more? I thought I did pretty well.

(Please use other side for additional comments.)
### Written Comments

3. Additional Comments

Marc is a great professor. He went through everything slowly so you would actually understand it.

### Student Release Questions:

These questions were selected by the Student Senate to provide future students with information about the course.

1. Approximately how many hours per week do you spend working on homework, reading, and projects for this course?
   - 0-2 hours per week
   - 3-5 hours per week
   - 6-9 hours per week
   - 10-14 hours per week
   - 15 hours per week or more

2. Compared to other courses at this level, the amount I have learned in this course is:
   - Less
   - About the same
   - More
   - I have not taken other courses at this level

3. Compared to other courses at this level, the difficulty of this course is:
   - Less
   - About the same
   - More
   - I have not taken other courses at this level

4. I would recommend this course to other students.
   - Yes
   - No

5. I would recommend this instructor to other students.
   - Yes
   - No

Rate your instructor in terms of the following characteristics:

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Agree</th>
<th>Somewhat Agree</th>
<th>Somewhat Disagree</th>
<th>Disagree</th>
<th>Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Is approachable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Makes effective use of course readings</td>
<td></td>
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<td></td>
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<tr>
<td>8. Creates worthwhile assignments</td>
<td></td>
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<td></td>
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<tr>
<td>9. Has a reasonable grading system</td>
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</tbody>
</table>

### Course Environment

1. How would you rate the physical environment in which you take this class, especially the classroom facilities, including your ability to see, hear,
University of Minnesota Student Rating of Teaching

INSTRUCTOR: Marc Riedel  TERM: Spring  CURRENT YEAR: 2010
DEPARTMENT: EE  COURSE #: 1381  SECTION: 001

Carefully read each statement and select a response based on the following: 6-Strongly Agree 5-Agree 4-Somewhat Agree 3-Somewhat Disagree 2-Disagree 1-Strongly Disagree

1. The instructor was well prepared for class.
2. The instructor presented the subject matter clearly.
3. The instructor provided feedback intended to improve my course performance.
4. The instructor treated me with respect.
5. I have a deeper understanding of the subject matter as a result of this course.
6. My interest in the subject matter was stimulated by this course.

Written Comments

1. What did the instructor do that most helped your learning?

   He explained everything clearly and took the time to explain more difficult concepts thoroughly to ensure they were understood.

2. What could you have done to be a better learner?

   I could have done more reading outside of the class to better prepare myself to understand each lecture.

(Please use other side for additional comments.)

To preserve anonymity in small classes, the demographic section below will be cut off before the forms are returned to the instructor. Additionally, summary reports will not be sent to the instructor for any category containing fewer than five students.
**Written Comments**

3. Additional Comments

Marc knows the subject matter very well and does an excellent job teaching it as well as made it interesting.

---

**Student Release Questions:** These questions were selected by the Student Senate to provide future students with information about the course.

<table>
<thead>
<tr>
<th>Question</th>
<th>Response Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Approximately how many hours per week do you spend working on homework, reading, and projects for this course?</td>
<td>- 0-2 hours per week  - 3-5 hours per week  - 6-9 hours per week  - 10-14 hours per week  - 15 hours per week or more</td>
</tr>
<tr>
<td>2. Compared to other courses at this level, the amount I have learned in this course is:</td>
<td>- Less  - About the same  - More  - I have not taken other courses at this level</td>
</tr>
<tr>
<td>3. Compared to other courses at this level, the difficulty of this course is:</td>
<td>- Less  - About the same  - More  - I have not taken other courses at this level</td>
</tr>
<tr>
<td>4. I would recommend this course to other students.</td>
<td>- Yes  - No</td>
</tr>
<tr>
<td>5. I would recommend this instructor to other students.</td>
<td>- Yes  - No</td>
</tr>
<tr>
<td>6. Is approachable</td>
<td>- Agree  - Somewhat Agree  - Somewhat Disagree  - Disagree  - Not applicable</td>
</tr>
<tr>
<td>7. Makes effective use of course readings</td>
<td>-</td>
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<td>8. Creates worthwhile assignments</td>
<td>-</td>
</tr>
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<td>9. Has a reasonable grading system</td>
<td>-</td>
</tr>
</tbody>
</table>

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**Course Environment**

1. How would you rate the physical environment in which you take this class, especially the classroom facilities, including your ability to see, hear, concentrate and participate?  

Exceptional  
Satisfactory  
Very Poor
University of Minnesota Student Rating of Teaching

INSTRUCTOR: Marc Riedel
TERM: Spring
CURRENT YEAR: 2010
DEPARTMENT: EE
COURSE #: 1301
SECTION: 

Carefully read each statement and select a response based on the following: 6-Strongly Agree 5-Agree 4-Somewhat Agree 3-Somewhat Disagree 2-Disagree 1-Strongly Disagree

1. The instructor was well prepared for class.
2. The instructor presented the subject matter clearly.
3. The instructor provided feedback intended to improve my course performance.
4. The instructor treated me with respect.
5. I have a deeper understanding of the subject matter as a result of this course.
6. My interest in the subject matter was stimulated by this course.

Written Comments

1. What did the instructor do that most helped your learning?

    Clear and interesting. Explained material very well. I have a deeper understanding of the concepts.

2. What could you have done to be a better learner?

(Please use other side for additional comments.)

To preserve anonymity in small classes, the demographic section below will be cut off before the forms are returned to the instructor. Additionally, summary reports will not be sent to the instructor for any category containing fewer than five students.
Written Comments
3. Additional Comments

Excellent instructors makes coming to class enjoyable.

Student Release Questions: These questions were selected by the Student Senate to provide future students with information about the course.

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   - Less
   - About the same
   - More
   - I have not taken other courses at this level

4. I would recommend this course to other students.
   - Yes
   - No

5. I would recommend this instructor to other students.
   - Yes
   - No

Rate your instructor in terms of the following characteristics:

6. Is approachable
7. Makes effective use of course readings
8. Creates worthwhile assignments
9. Has a reasonable grading system

Course Environment
1. How would you rate the physical environment in which you take this class, especially the classroom facilities, including your ability to see, hear, concentrate and participate?

   Exceptional  Satisfactory  Very Poor
   o  o  o  o  o  o  o  o
University of Minnesota Student Rating of Teaching

INSTRUCTOR: Marc Kiedel  TERM: SPRING  CURRENT YEAR: 2010

DEPARTMENT: EE  COURSE #: 1301  SECTION: 

Carefully read each statement and select a response based on the following: 6-Strongly Agree 5-Agree 4-Somewhat Agree 3-Somewhat Disagree 2-Disagree 1-Strongly Disagree

<table>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. My interest in the subject matter was stimulated by this course.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Written Comments

1. What did the instructor do that most helped your learning?
   - Explained Everything thoroughly
   - Held prep sessions before tests w/pizza

2. What could you have done to be a better learner?
   - Come to class more often

(Please use other side for additional comments.)

To preserve anonymity in small classes, the demographic section below will be cut off before the forms are returned to the instructor. Additionally, summary reports will not be sent to the instructor for any category containing fewer than five students.
Written Comments
3. Additional Comments
- You have been one of the best professors I've had so far.
- One thing you can work on is limiting how many questions you answer fully in class. There is a point where it is the student's responsibility to learn material on their own or reach out to you after class. It does show, however, that you really care about your students.

Student Release Questions: These questions were selected by the Student Senate to provide future students with information about the course.

1. Approximately how many hours per week do you spend working on homework, reading, and projects for this course?
   - 0-2 hours per week
   - 3-5 hours per week
   - 6-9 hours per week
   - 10-14 hours per week
   - 15 hours per week or more

2. Compared to other courses at this level, the amount I have learned in this course is:
   - Less
   - About the same
   - More
   - I have not taken other courses at this level

3. Compared to other courses at this level, the difficulty of this course is:
   - Less
   - About the same
   - More
   - I have not taken other courses at this level

4. I would recommend this course to other students.
   - Yes
   - No

5. I would recommend this instructor to other students.
   - Yes
   - No

Rate your instructor in terms of the following characteristics:

6. Is approachable
7. Makes effective use of course readings
8. Creates worthwhile assignments
9. Has a reasonable grading system

Course Environment
1. How would you rate the physical environment in which you take this class, especially the classroom facilities, including your ability to see, hear, concentrate and participate?

   Exceptional  Satisfactory  Very Poor
   [ ] [ ] [ ]
University of Minnesota
Student Evaluation of Teaching (SET) - Form D - SR (Student Release)

Your responses to this questionnaire are important because they will be used in tenure, promotion, and salary decisions for your instructor. The first five questions are required by the 1991 Senate Policy. The ten student release questions appear on the back of this form. Your thoughtful written comments are especially requested, and may help your instructor improve future course offerings. The results of this evaluation (including the evaluation forms) will be returned to the instructor after the final grades are submitted for this course. Please use only a No. 2 pencil - not pen. Completely blacken the circle of your choice. If you erase, erase completely.

INSTRUCTOR: Move Reidel
DEPARTMENT: EE
TERM: Spring
CURRENT YEAR: 2007
COURSE NO: 2361
SECTION: 

1. How would you rate the instructor's overall teaching ability?
2. How would you rate the instructor's knowledge of the subject matter?
3. How would you rate the instructor's respect and concern for students?
4. How would you rate the physical environment in which you take this class, especially the classroom facilities, including your ability to see, hear, concentrate, and participate?
5. How much would you say you learned in this course?

The following will be used for course improvement purposes.

6. Instructor's clarity in presenting or discussing course material.
7. Instructor's rapport with you as a student.
8. Instructor's use of technology to enhance your learning experience in the course.
9. Instructor's success in getting you to think.
10. Instructor's attention to what helps you learn.
11. Instructor's respect for students' individual differences.
12. Overall quality of test(s) and handouts.
13. Helpfulness of feedback given you about your performance.
14. Degree to which exams and quizzes (or other evaluation procedures) measured your knowledge and understanding.
15. Instructor's encouragement of students to express their views.

Your instructor may add questions to those above. If so, please mark your responses in the appropriate spaces below.

16. 1 2 3 4 5 6 7
17. 1 2 3 4 5 6 7
18. 1 2 3 4 5 6 7
19. 1 2 3 4 5 6 7
20. 1 2 3 4 5 6 7
21. 1 2 3 4 5 6 7

To preserve anonymity in small classes, the demographic section below will be cut off before the forms are returned to the instructor. Additionally, summary reports will not be sent to the instructor for any category containing fewer than five students.
Please read through the following list. Mark any areas which were either a weakness or a strength for the instructor of this course.

<table>
<thead>
<tr>
<th>Instructor:</th>
<th>Weakness</th>
<th>Strength</th>
<th>Instructor:</th>
<th>Weakness</th>
<th>Strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is accessible to students outside of class.</td>
<td></td>
<td></td>
<td>Paces assignments and tests appropriately throughout the course.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effectively manages the classroom environment.</td>
<td></td>
<td></td>
<td>Defines academic dishonesty (cheating).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arrives and begins the class on time.</td>
<td></td>
<td></td>
<td>Explains and clarifies grading policies.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ends the class within the time scheduled.</td>
<td></td>
<td></td>
<td>Makes supplemental readings, technological support and/or reserve materials available to students.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effectively facilitates classroom discussions.</td>
<td></td>
<td></td>
<td>Effectively uses technology and multimedia throughout the course.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Integrates topics and activities effectively throughout the course.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selects course content appropriate to course length.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Please comment on this course and the quality of instruction you received:

One of the best 4 this.  
University of Minnesota
Student Evaluation of Teaching (SET) - Form D - SR (Student Release)

Your responses to this questionnaire are important because they will be used in tenure, promotion, and salary decisions for your instructor. The first five questions are required by the 1991 Senate Policy. The ten student release questions appear on the back of this form. Your thoughtful written comments are especially requested, and may help your instructor improve future course offerings. The results of this evaluation (including the evaluation forms) will be returned to the instructor after the final grades are submitted for this course. Please use only a No. 2 pencil - not pen. Completely blacken the circle of your choice. If you erase, erase completely.

INSTRUCTOR: Marc Riedel  TERM: Spring  CURRENT YEAR: 07
DEPARTMENT: EE  COURSE NO.: 2301  SECTION: 

1. How would you rate the instructor's overall teaching ability?
2. How would you rate the instructor's knowledge of the subject matter?
3. How would you rate the instructor's respect and concern for students?
4. How would you rate the physical environment in which you take this class, especially the classroom facilities, including your ability to see, hear, concentrate, and participate?

5. How much would you say you learned in this course?

The following will be used for course improvement purposes.

6. Instructor's clarity in presenting or discussing course material.
7. Instructor's rapport with you as a student.
8. Instructor's use of technology to enhance your learning experience in the course.
9. Instructor's success in getting you to think.
10. Instructor's attention to what helps you learn.
11. Instructor's respect for students' individual differences.
12. Overall quality of text(s) and handouts.
13. Helpfulness of feedback given you about your performance.
14. Degree to which exams and quizzes (or other evaluation procedures) measured your knowledge and understanding.
15. Instructor's encouragement of students to express their views.

Your instructor may add questions to those above. If so, please mark your responses in the appropriate spaces below.

16. 
17. 
18. 
19. 
20. 
21. 

To preserve anonymity in small classes, the demographic section below will be cut off before the forms are returned to the instructor. Additionally, summary reports will not be sent to the instructor for any category containing fewer than five students.
Please read through the following list. Mark any areas which were either a weakness or a strength for the instructor of this course.

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<td></td>
</tr>
<tr>
<td>Selects course content appropriate to course length.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Please comment on this course and the quality of instruction you received.

Most fun class in EE so far.

I loved this course.
### University of Minnesota Student Rating of Teaching

**INSTRUCTOR:** Marc Riedel  
**TERM:** Spring  
**CURRENT YEAR:** 2008

**DEPARTMENT:** EE  
**COURSE #:** 2301  
**SECTION:**

Carefully read each statement and select a response based on the following: 6-Strongly Agree 5-Agree 4-Somewhat Agree 3-Somewhat Disagree 2-Disagree 1-Strongly Disagree

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Somewhat Agree</th>
<th>Somewhat Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The instructor was well prepared for class.</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2. The instructor presented the subject matter clearly.</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>3. The instructor provided feedback intended to improve my course performance.</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>4. The instructor treated me with respect.</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>5. I have a deeper understanding of the subject matter as a result of this course.</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>6. My interest in the subject matter was stimulated by this course.</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

**Written Comments**

1. What did the instructor do that most helped your learning?
   
   **Clear, concise descriptions & explanations.**
   
   **Very friendly, smart, & approachable.**

2. What could you have done to be a better learner?
   
   **Ask more questions.**

(Please use other side for additional comments.)

---

To preserve anonymity in small classes, the demographic section below will be cut off before the forms are returned to the instructor. Additionally, summary reports will not be sent to the instructor for any category containing fewer than five students.
### Written Comments

3. Additional Comments

Marc Rietel is one of the best professors I've had in EE so far.

### Student Release Questions: These questions were selected by the Student Senate to provide future students with information about the course.

1. Approximately how many hours per week do you spend working on homework, reading, and projects for this course?
   - [ ] 0-2 hours per week
   - [ ] 3-5 hours per week
   - [ ] 6-9 hours per week
   - [ ] 10-14 hours per week
   - [ ] 15 hours per week or more

2. Compared to other courses at this level, the amount I have learned in this course is:
   - [ ] Less
   - [ ] About the same
   - [ ] More
   - [ ] I have not taken other courses at this level

3. Compared to other courses at this level, the difficulty of this course is:
   - [ ] Less
   - [ ] About the same
   - [ ] More
   - [ ] I have not taken other courses at this level

4. I would recommend this course to other students.
   - [ ] Yes
   - [ ] No

5. I would recommend this instructor to other students.
   - [ ] Yes
   - [ ] No

Rate your instructor in terms of the following characteristics:

<table>
<thead>
<tr>
<th>Agree</th>
<th>Somewhat Agree</th>
<th>Somewhat Disagree</th>
<th>Disagree</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

6. Is approachable

7. Makes effective use of course readings

8. Creates worthwhile assignments

9. Has a reasonable grading system

### Course Environment

1. How would you rate the physical environment in which you take this class, especially the classroom facilities, including your ability to see, hear, concentrate and participate?

   Exceptional: ☐  Satisfactory: ☐  Very Poor: ☐

   Cut Here
University of Minnesota Student Rating of Teaching

INSTRUCTOR: Marc Kidel
TERM: Spring
CURRENT YEAR: 2009

DEPARTMENT: EE
COURSE #: 2301
SECTION: 

Carefully read each statement and select a response based on the following: 6-Strongly Agree 5-Agree 4-Somewhat Agree 3-Somewhat Disagree 2-Disagree 1-Strongly Disagree

1. The instructor was well prepared for class.
2. The instructor presented the subject matter clearly.
3. The instructor provided feedback intended to improve my course performance.
4. The instructor treated me with respect.
5. I have a deeper understanding of the subject matter as a result of this course.
6. My interest in the subject matter was stimulated by this course.

Written Comments

1. What did the instructor do that most helped your learning?
   He did not teach straight out of book.

2. What could you have done to be a better learner?
   I could have read more.

(Please use other side for additional comments.)

To preserve anonymity in small classes, the demographic section below will be cut off before the forms are returned to the instructor. Additionally, summary reports will not be sent to the instructor for any category containing fewer than five students.
Written Comments
3. Additional Comments

He is a wonderful teacher.
I love his enthusiasm.

Student Release Questions: These questions were selected by the Student Senate to provide future students with information about the course.

1. Approximately how many hours per week do you spend working on homework, reading, and projects for this course?
   - 0-2 hours per week
   - 3-5 hours per week
   - 6-9 hours per week
   - 10-14 hours per week
   - 15 hours per week or more

2. Compared to other courses at this level, the amount I have learned in this course is:
   - Less
   - About the same
   - More
   - I have not taken other courses at this level

3. Compared to other courses at this level, the difficulty of this course is:
   - Less
   - About the same
   - More
   - I have not taken other courses at this level

4. I would recommend this course to other students.
   - Yes
   - No

5. I would recommend this instructor to other students.
   - Yes
   - No

Rate your instructor in terms of the following characteristics:

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Agree</th>
<th>Somewhat Agree</th>
<th>Somewhat Disagree</th>
<th>Disagree</th>
<th>Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Is approachable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Makes effective use of course readings</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Creates worthwhile assignments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Has a reasonable grading system</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Course Environment

1. How would you rate the physical environment in which you take this class, especially the classroom facilities, including your ability to see, hear, concentrate and participate?

   Exceptional Satisfactory Very Poor
   ( )    ( )    ( )
University of Minnesota Student Rating of Teaching

INSTRUCTOR: Marc Rodel  TERM: Spring  CURRENT YEAR: 2009
DEPARTMENT: EE  COURSE #: 2301
SECTION: 

Carefully read each statement and select a response based on the following:  6-Strongly Agree  5-Agree  4-Somewhat Agree  3-Somewhat Disagree  2-Disagree  1-Strongly Disagree

1. The instructor was well prepared for class.
   
2. The instructor presented the subject matter clearly.
   
3. The instructor provided feedback intended to improve my course performance.
   
4. The instructor treated me with respect.
   
5. I have a deeper understanding of the subject matter as a result of this course.
   
6. My interest in the subject matter was stimulated by this course.

Written Comments

1. What did the instructor do that most helped your learning?
   
   Examples and class involvement recovered topics that weren't clear

2. What could you have done to be a better learner?

(Please use other side for additional comments.)

To preserve anonymity in small classes, the demographic section below will be cut off before the forms are returned to the instructor. Additionally, summary reports will not be sent to the instructor for any category containing fewer than five students.
3. Additional Comments

Great teacher. Sometimes spent too much time writing for the class to give feedback. Did a thorough job of covering the material.

Student Release Questions: These questions were selected by the Student Senate to provide future students with information about the course.

1. Approximately how many hours per week do you spend working on homework, reading, and projects for this course?
   - 0-2 hours per week
   - 3-5 hours per week
   - 6-9 hours per week
   - 10-14 hours per week
   - 15 hours per week or more

2. Compared to other courses at this level, the amount I have learned in this course is:
   - Less
   - About the same
   - More
   - I have not taken other courses at this level

3. Compared to other courses at this level, the difficulty of this course is:
   - Less
   - About the same
   - More
   - I have not taken other courses at this level

4. I would recommend this course to other students.
   - Yes
   - No

5. I would recommend this instructor to other students.
   - Yes
   - No

Rate your instructor in terms of the following characteristics:

6. Is approachable

7. Makes effective use of course readings

8. Creates worthwhile assignments

9. Has a reasonable grading system

Course Environment

1. How would you rate the physical environment in which you take this class, especially the classroom facilities, including your ability to see, hear, concentrate and participate?

   Exceptional  Satisfactory  Very Poor
   ☐  ☐  ☐  ☐  ☐  ☐  ☐  ☐
University of Minnesota Student Rating of Teaching

INSTRUCTOR: MARC RIEDEL  TERM: SPRING  CURRENT YEAR: 2009
DEPARTMENT: EE  COURSE #: 2301  SECTION: 

Carefully read each statement and select a response based on the following: 6-Strongly Agree 5-Agree 4-Somewhat Agree 3-Somewhat Disagree 2-Disagree 1-Strongly Disagree

1. The instructor was well prepared for class.
2. The instructor presented the subject matter clearly.
3. The instructor provided feedback intended to improve my course performance.
4. The instructor treated me with respect.
5. I have a deeper understanding of the subject matter as a result of this course.
6. My interest in the subject matter was stimulated by this course.

Written Comments
1. What did the instructor do that most helped your learning?
   HIS REVIEW SESSIONS WERE PHENOMINAL

2. What could you have done to be a better learner?
   STUDIED MORE

(Please use other side for additional comments.)

To preserve anonymity in small classes, the demographic section below will be cut off before the forms are returned to the instructor. Additionally, summary reports will not be sent to the instructor for any category containing fewer than five students.
Written Comments

3. Additional Comments

Marc is probably the best professor I’ve ever had in my educational career. I feel that the university is truly blessed to have a professor of Marc’s caliber. He is incredibly sincere and compassionate toward students, he is a very gifted individual.

I hope Marc continues to teach for many years.

Student Release Questions: These questions were selected by the Student Senate to provide future students with information about the course.

1. Approximately how many hours per week do you spend working on homework, reading, and projects for this course?
   - 0-2 hours per week
   - 3-5 hours per week
   - 6-9 hours per week
   - 10-14 hours per week
   - 15 hours per week or more

2. Compared to other courses at this level, the amount I have learned in this course is:
   - Less
   - About the same
   - More
   - I have not taken other courses at this level

3. Compared to other courses at this level, the difficulty of this course is:
   - Less
   - About the same
   - More
   - I have not taken other courses at this level

4. I would recommend this course to other students.
   - Yes
   - No

5. I would recommend this instructor to other students.
   - Yes
   - No

Rate your instructor in terms of the following characteristics:

6. Is approachable
7. Makes effective use of course readings
8. Creates worthwhile assignments
9. Has a reasonable grading system

Course Environment

1. How would you rate the physical environment in which you take this class, especially the classroom facilities, including your ability to see, hear, concentrate and participate?
   - Exceptional
   - Satisfactory
   - Very Poor

Cut Here
University of Minnesota Student Rating of Teaching

INSTRUCTOR: Marc Riedl  
DEPARTMENT: EE  
TERM: Spring  
CURRENT YEAR: 2009  
COURSE #: 2301  
SECTION: 1

Carefully read each statement and select a response based on the following: 6-Strongly Agree 5-Agree 4-Somewhat Agree 3-Somewhat Disagree 2-Disagree 1-Strongly Disagree

1. The instructor was well prepared for class.  
2. The instructor presented the subject matter clearly.  
3. The instructor provided feedback intended to improve my course performance.  
4. The instructor treated me with respect.  
5. I have a deeper understanding of the subject matter as a result of this course.  
6. My interest in the subject matter was stimulated by this course.

Written Comments

1. What did the instructor do that most helped your learning?  
   Enthusiastic + understanding

2. What could you have done to be a better learner?  
   devote more time to homework

(Please use other side for additional comments.)

To preserve anonymity in small classes, the demographic section below will be cut off before the forms are returned to the instructor. Additionally, summary reports will not be sent to the instructor for any category containing fewer than five students.
Student Release Questions: These questions were selected by the Student Senate to provide future students with information about the course.

1. Approximately how many hours per week do you spend working on homework, reading, and projects for this course?
   - 0-2 hours per week
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2. Compared to other courses at this level, the amount I have learned in this course is:
   - Less
   - About the same
   - More
   - I have not taken other courses at this level

3. Compared to other courses at this level, the difficulty of this course is:
   - Less
   - About the same
   - More
   - I have not taken other courses at this level

4. I would recommend this course to other students.
   - Yes
   - No

5. I would recommend this instructor to other students.
   - Yes
   - No

6. Is approachable
7. Makes effective use of course readings
8. Creates worthwhile assignments
9. Has a reasonable grading system

Rate your instructor in terms of the following characteristics

Course Environment

1. How would you rate the physical environment in which you take this class, especially the classroom facilities, including your ability to see, hear, concentrate and participate?

   Exceptional  Satisfactory  Very Poor
   7  6  5  4  3  2  1
University of Minnesota Student Rating of Teaching

INSTRUCTOR:  
TERM:  
CURRENT YEAR:  

DEPARTMENT:  
COURSE #:  
SECTION:  

Carefully read each statement and select a response based on the following: 6-Strongly Agree 5-Agree 4-Somewhat Agree 3-Somewhat Disagree 2-Disagree 1-Strongly Disagree

1. The instructor was well prepared for class.
2. The instructor presented the subject matter clearly.
3. The instructor provided feedback intended to improve my course performance.
4. The instructor treated me with respect.
5. I have a deeper understanding of the subject matter as a result of this course.
6. My interest in the subject matter was stimulated by this course.

Written Comments
1. What did the instructor do that most helped your learning?

   Greatest instructor of all time!!

2. What could you have done to be a better learner?

   be more prepared

(Please use other side for additional comments.)

To preserve anonymity in small classes, the demographic section below will be cut off before the forms are returned to the instructor. Additionally, summary reports will not be sent to the instructor for any category containing fewer than five students.
### Written Comments
3. Additional Comments

Great Professor!

---

### Student Release Questions:

These questions were selected by the Student Senate to provide future students with information about the course.

1. Approximately how many hours per week do you spend working on homework, reading, and projects for this course?
   - 0-2 hours per week
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3. Compared to other courses at this level, the difficulty of this course is:
   - Less
   - About the same
   - More
   - I have not taken other courses at this level

4. I would recommend this course to other students.
   - Yes
   - No

5. I would recommend this instructor to other students.
   - Yes
   - No

Rate your instructor in terms of the following characteristics

<table>
<thead>
<tr>
<th>Agree</th>
<th>Somewhat Agree</th>
<th>Somewhat Disagree</th>
<th>Disagree</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. Is approachable
7. Makes effective use of course readings
8. Creates worthwhile assignments
9. Has a reasonable grading system

---

### Course Environment

1. How would you rate the physical environment in which you take this class, especially the classroom facilities, including your ability to see, hear, concentrate and participate?

   - Exceptional
   - Satisfactory
   - Very Poor

   ![Rating Scale]
University of Minnesota Student Rating of Teaching

INSTRUCTOR: MARC RIEDEL        TERM: SPRING        CURRENT YEAR: 2009
DEPARTMENT: ELECTRICAL ENGINEERING        COURSE #: 2301        SECTION: 

Carefully read each statement and select a response based on the following: 6-Strongly Agree 5-Agree 4-Somewhat Agree 3-Somewhat Disagree 2-Disagree 1-Strongly Disagree

1. The instructor was well prepared for class.
2. The instructor presented the subject matter clearly.
3. The instructor provided feedback intended to improve my course performance.
4. The instructor treated me with respect.
5. I have a deeper understanding of the subject matter as a result of this course.
6. My interest in the subject matter was stimulated by this course.

Written Comments
1. What did the instructor do that most helped your learning?

   MARC IS THE MOST HELPFUL PROFESSOR I'VE HAD YET AT THE U OF MN. HIS LECTURES WERE WELL ORGANIZED, HIS HOMEWORK WAS CHALLENGING BUT USEFUL TO HELP ME LEARN THE SUBJECT MATTER.

2. What could you have done to be a better learner?

(Please use other side for additional comments.)

To preserve anonymity in small classes, the demographic section below will be cut off before the forms are returned to the instructor. Additionally, summary reports will not be sent to the instructor for any category containing fewer than five students.
Written Comments
3. Additional Comments

Student Release Questions: These questions were selected by the Student Senate to provide future students with information about the course.

1. Approximately how many hours per week do you spend working on homework, reading, and projects for this course?
   - 0-2 hours per week
   - 3-5 hours per week
   - 6-9 hours per week
   - 10-14 hours per week
   - 15 hours per week or more

2. Compared to other courses at this level, the amount I have learned in this course is:
   - Less
   - About the same
   - More
   - I have not taken other courses at this level

3. Compared to other courses at this level, the difficulty of this course is:
   - Less
   - About the same
   - More
   - I have not taken other courses at this level

4. I would recommend this course to other students.
   - Yes
   - No

5. I would recommend this instructor to other students.
   - Yes
   - No

Rate your instructor in terms of the following characteristics

6. Is approachable
   - Agree
   - Somewhat Agree
   - Disagree
   - Not applicable

7. Makes effective use of course readings
   - Agree
   - Somewhat Agree
   - Disagree
   - Not applicable

8. Creates worthwhile assignments
   - Agree
   - Somewhat Agree
   - Disagree
   - Not applicable

9. Has a reasonable grading system
   - Agree
   - Somewhat Agree
   - Disagree
   - Not applicable

Course Environment
1. How would you rate the physical environment in which you take this class, especially the classroom facilities, including your ability to see, hear, concentrate and participate?

<table>
<thead>
<tr>
<th>Exceptional</th>
<th>Satisfactory</th>
<th>Very Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>6</td>
<td>1</td>
</tr>
</tbody>
</table>
University of Minnesota
Student Evaluation of Teaching (SET) - Form D - SR (Student Release)

Your responses to this questionnaire are important because they will be used in tenure, promotion, and salary decisions for your instructor. The first five questions are required by the 1991 Senate Policy. The ten student release questions appear on the back of this form. Your thoughtful written comments are especially requested, and may help your instructor improve future course offerings. The results of this evaluation (including the evaluation forms) will be returned to the instructor after the final grades are submitted for this course. Please use only a No. 2 pencil - not pen. Completely blacken the circle of your choice. If you erase, erase completely.

INSTRUCTOR: Reidle
DEPARTMENT: EE
TERM: Spring
CURRENT YEAR: 07
COURSE NO.: 3201
SECTION:

<table>
<thead>
<tr>
<th></th>
<th>Very poor</th>
<th>Satisfactory</th>
<th>Exceptional</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>How would you rate the instructor's overall teaching ability?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>How would you rate the instructor's knowledge of the subject matter?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>How would you rate the instructor's respect and concern for students?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>How would you rate the physical environment in which you take this class, especially the classroom facilities, including your ability to see, hear, concentrate, and participate?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>How much would you say you learned in this course?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Instructor's clarity in presenting or discussing course material.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Instructor's rapport with you as a student.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Instructor's use of technology to enhance your learning experience in the course.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Instructor's success in getting you to think.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Instructor's attention to what helps you learn.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Instructor's respect for students' individual differences.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Overall quality of text(s) and handouts.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Helpfulness of feedback given you about your performance.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Degree to which exams and quizzes (or other evaluation procedures) measured your knowledge and understanding.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Instructor's encouragement of students to express their views.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The following will be used for course improvement purposes.

Your instructor may add questions to those above. If so, please mark your responses in the appropriate spaces below.

16. [ ] [ ] [ ] [ ] [ ] [ ] [ ]
17. [ ] [ ] [ ] [ ] [ ] [ ] [ ]
18. [ ] [ ] [ ] [ ] [ ] [ ] [ ]
19. [ ] [ ] [ ] [ ] [ ] [ ] [ ]
20. [ ] [ ] [ ] [ ] [ ] [ ] [ ]
21. [ ] [ ] [ ] [ ] [ ] [ ] [ ]

To preserve anonymity in small classes, the demographic section below will be cut off before the forms are returned to the instructor. Additionally, summary reports will not be sent to the instructor for any category containing fewer than five students.
Please read through the following list. Mark any areas which were either a weakness or a strength for the instructor of this course.

<table>
<thead>
<tr>
<th>Instructor:</th>
<th>Weakness</th>
<th>Strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is accessible to students outside of class.</td>
<td>o</td>
<td>☐</td>
</tr>
<tr>
<td>Effectively manages the classroom environment.</td>
<td>o</td>
<td>☐</td>
</tr>
<tr>
<td>Arrives and begins the class on time.</td>
<td>o</td>
<td>☐</td>
</tr>
<tr>
<td>Ends the class within the time scheduled.</td>
<td>o</td>
<td>☐</td>
</tr>
<tr>
<td>Effectively facilitates classroom discussions.</td>
<td>o</td>
<td>☐</td>
</tr>
<tr>
<td>Integrates topics and activities effectively throughout the course.</td>
<td>o</td>
<td>☐</td>
</tr>
<tr>
<td>Selects course content appropriate to course length.</td>
<td>o</td>
<td>☐</td>
</tr>
</tbody>
</table>

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<tr>
<th>Instructor:</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Paces assignments and tests appropriately throughout the course.</td>
<td>o</td>
<td>☐</td>
</tr>
<tr>
<td>Defines academic dishonesty (cheating).</td>
<td>o</td>
<td>☐</td>
</tr>
<tr>
<td>Explains and clarifies grading policies.</td>
<td>o</td>
<td>☐</td>
</tr>
<tr>
<td>Makes supplemental readings, technological support and/or reserve materials available to students.</td>
<td>o</td>
<td>☐</td>
</tr>
<tr>
<td>Effectively uses technology and multimedia throughout the course.</td>
<td>o</td>
<td>☐</td>
</tr>
</tbody>
</table>

Please comment on this course and the quality of instruction you received.

**Excellent Teacher.**

Cut Here
University of Minnesota
Student Evaluation of Teaching (SET) - Form D - SR (Student Release)

Your responses to this questionnaire are important because they will be used in tenure, promotion, and salary decisions for your instructor. The first five questions are required by the 1991 Senate Policy. The ten student release questions appear on the back of this form. Your thoughtful written comments are especially requested, and may help your instructor improve future course offerings. The results of this evaluation (including the evaluation forms) will be returned to the instructor after the final grades are submitted for this course. Please use only a No. 2 pencil - not pen. Completely blacken the circle of your choice. If you erase, erase completely.

INSTRUCTOR: Manc Nieder
TERM: Spring
CURRENT YEAR:

DEPARTMENT: 
COURSE NO.: 64361
SECTION: 

1. How would you rate the instructor's overall teaching ability? 
2. How would you rate the instructor's knowledge of the subject matter? 
3. How would you rate the instructor's respect and concern for students? 
4. How would you rate the physical environment in which you take this class, especially the classroom facilities, including your ability to see, hear, concentrate, and participate? 
5. How much would you say you learned in this course? 

The following will be used for course improvement purposes.

6. Instructor's clarity in presenting or discussing course material. 
7. Instructor's rapport with you as a student. 
8. Instructor's use of technology to enhance your learning experience in the course. 
9. Instructor's success in getting you to think. 
10. Instructor's attention to what helps you learn. 
11. Instructor's respect for students' individual differences. 
12. Overall quality of text(s) and handouts. 
13. Helpfulness of feedback given you about your performance. 
14. Degree to which exams and quizzes (or other evaluation procedures) measured your knowledge and understanding. 
15. Instructor's encouragement of students to express their views. 

Your instructor may add questions to those above. If so, please mark your responses in the appropriate spaces below.

16. 
17. 

18. 
19. 

20. 
21. 

To preserve anonymity in small classes, the demographic section below will be cut off before the forms are returned to the instructor. Additionally, summary reports will not be sent to the instructor for any category containing fewer than five students.
Please read through the following list. Mark any areas which were either a weakness or a strength for the instructor of this course.

<table>
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<tr>
<th>Instructor</th>
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<th>Strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is accessible to students outside of class.</td>
<td>〇</td>
<td>☑</td>
</tr>
<tr>
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<td>☑</td>
</tr>
<tr>
<td>Effectively uses technology and multimedia throughout the course.</td>
<td>〇</td>
<td>☑</td>
</tr>
</tbody>
</table>

Please comment on this course and the quality of instruction you received.

One of the best instructors.
University of Minnesota
Student Evaluation of Teaching (SET) - Form D - SR (Student Release)

Your responses to this questionnaire are important because they will be used in tenure, promotion, and salary decisions for your instructor. The first five questions are required by the 1991 Senate Policy. The ten student release questions appear on the back of this form. Your thoughtful written comments are especially requested, and may help your instructor improve future course offerings. The results of this evaluation (including the evaluation forms) will be returned to the instructor after the final grades are submitted for this course. Please use only a No. 2 pencil - not pen. Completely blacken the circle of your choice. If you erase, erase completely.

INSTRUCTOR: Marc Riedel  TERM: Spring  CURRENT YEAR: 2007
DEPARTMENT: Electrical Engineering  COURSE NO.: 4301  SECTION: __________

1. How would you rate the instructor's overall teaching ability?
2. How would you rate the instructor's knowledge of the subject matter?
3. How would you rate the instructor's respect and concern for students?
4. How would you rate the physical environment in which you take this class, especially the classroom facilities, including your ability to see, hear, concentrate, and participate?

5. How much would you say you learned in this course?

The following will be used for course improvement purposes.

6. Instructor's clarity in presenting or discussing course material.
7. Instructor's rapport with you as a student.
8. Instructor's use of technology to enhance your learning experience in the course.
9. Instructor's success in getting you to think.
10. Instructor's attention to what helps you learn.
11. Instructor's respect for students' individual differences.
12. Overall quality of text(s) and handouts.
13. Helpfulness of feedback given you about your performance.
14. Degree to which exams and quizzes (or other evaluation procedures) measured your knowledge and understanding.
15. Instructor's encouragement of students to express their views.

Your instructor may add questions to those above. If so, please mark your responses in the appropriate spaces below.

16. ____________  18. ____________  20. ____________
17. ____________  19. ____________  21. ____________

To preserve anonymity in small classes, the demographic section below will be cut off before the forms are returned to the instructor. Additionally, summary reports will not be sent to the instructor for any category containing fewer than five students.

Cut Here...
Please read through the following list. Mark any areas which were either a weakness or a strength for the instructor of this course.

<table>
<thead>
<tr>
<th>Instructor:</th>
<th>Weakness</th>
<th>Strength</th>
<th>Instructor:</th>
<th>Weakness</th>
<th>Strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is accessible to students outside of class.</td>
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<td>Paces assignments and tests appropriately throughout the course.</td>
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<td></td>
</tr>
<tr>
<td>Effectively manages the classroom environment.</td>
<td></td>
<td></td>
<td>Defines academic dishonesty (cheating).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arrives and begins the class on time.</td>
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<td></td>
<td>Explains and clarifies grading policies.</td>
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<td>Effectively facilitates classroom discussions.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Selects course content appropriate to course length.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Please comment on this course and the quality of instruction you received.

Amazing instructor; made learning more than just a means to a grade, but a path to discovery, knowledge, & research.
University of Minnesota
Student Evaluation of Teaching (SET) - Form D - SR (Student Release)

Your responses to this questionnaire are important because they will be used in tenure, promotion, and salary decisions for your instructor. The first five questions are required by the 1991 Senate Policy. The ten student release questions appear on the back of this form. Your thoughtful written comments are especially requested, and may help your instructor improve future course offerings. The results of this evaluation (including the evaluation forms) will be returned to the instructor after the final grades are submitted for this course. Please use only a No. 2 pencil - not pen. Completely blacken the circle of your choice. If you erase, erase completely.

INSTRUCTOR: Prof. Marc Briedel

DEPARTMENT: EE

TERM: Fall 06

CURRENT YEAR: 06-07

COURSE NO.: 2301

SECTION: 3

1. How would you rate the instructor's overall teaching ability?

2. How would you rate the instructor's knowledge of the subject matter?

3. How would you rate the instructor's respect and concern for students?

4. How would you rate the physical environment in which you take this class, especially the classroom facilities, including your ability to see, hear, concentrate, and participate?

5. How much would you say you learned in this course?

The following will be used for course improvement purposes.

6. Instructor's clarity in presenting or discussing course material.

7. Instructor's rapport with you as a student.

8. Instructor's use of technology to enhance your learning experience in the course.

9. Instructor's success in getting you to think.

10. Instructor's attention to what helps you learn.

11. Instructor's respect for students' individual differences.

12. Overall quality of text(s) and handouts.

13. Helpfulness of feedback given you about your performance.

14. Degree to which exams and quizzes (or other evaluation procedures) measured your knowledge and understanding.

15. Instructor's encouragement of students to express their views.

Your instructor may add questions to those above. If so, please mark your responses in the appropriate spaces below.

16. 

17. 

18. 

19. 

20. 

21. 

To preserve anonymity in small classes, the demographic section below will be cut off before the forms are returned to the instructor. Additionally, summary reports will not be sent to the instructor for any category containing fewer than five students.
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<tbody>
<tr>
<td>Is accessible to students outside of class.</td>
<td>○</td>
<td>●</td>
</tr>
<tr>
<td>Effectively manages the classroom environment.</td>
<td>○</td>
<td>●</td>
</tr>
<tr>
<td>Arrives and begins the class on time.</td>
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<td>●</td>
</tr>
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<tr>
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<td>○</td>
<td>●</td>
</tr>
<tr>
<td>Instructor</td>
<td>Weakness</td>
<td>Strength</td>
</tr>
<tr>
<td>Paces assignments and tests appropriately throughout the course.</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Defines academic dishonesty (cheating).</td>
<td>○</td>
<td>○</td>
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<tr>
<td>Explains and clarifies grading policies.</td>
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<tr>
<td>Makes supplemental readings, technological support and/or reserve materials available to students.</td>
<td>○</td>
<td>●</td>
</tr>
<tr>
<td>Effectively uses technology and multimedia throughout the course.</td>
<td>○</td>
<td>●</td>
</tr>
</tbody>
</table>

Please comment on this course and the quality of instruction you received.

I was [underwhelmed] overall by the instructor's expertise in the subject.

Cut Here
University of Minnesota Student Rating of Teaching

Your responses to this questionnaire are important because they will be used in tenure, promotion, and salary decisions for your instructor. Your thoughtful written comments are especially requested, and may help your instructor improve future course offerings. The results of this evaluation (including the evaluation forms) will not be returned to the instructor until after the final grades are submitted for this course. In addition to a No. 2 pencil, you may use a blue or black pen to complete this form. Completely fill in the oval of your choice. If you erase, erase completely. Multiple marks will result in the answer being omitted from the results.

INSTRUCTOR: Marc Riedel TERM: fall CURRENT YEAR: 2009
DEPARTMENT: E. E. COURSE #: 2301 SECTION: Section 5

Carefully read each statement and select a response based on the following:
6-Strongly Agree 5-Agree 4-Somewhat Agree 3-Somewhat Disagree 2-Disagree 1-Strongly Disagree

1. The instructor was well prepared for class.
2. The instructor presented the subject matter clearly.
3. The instructor provided feedback intended to improve my course performance.
4. The instructor treated me with respect.
5. I have a deeper understanding of the subject matter as a result of this course.
6. My interest in the subject matter was stimulated by this course.

Written Comments

1. What did the instructor do that most helped your learning?

I would say that in general Mr. Riedel has been my best experience at the U in EE. He is easily, well prepared, accommodating, etc. He does a phenomenal job.

2. What could you have done to be a better learner?

Come to class more often, manage time better.

(Please use other side for additional comments.)

To preserve anonymity in small classes, the demographic section below will be cut off before the forms are returned to the instructor.
Student Release Questions: These questions were selected by the Student Senate to provide future students with information about the course.

1. Approximately how many hours per week do you spend working on homework, reading, and projects for this course?
   - 0-2 hours per week
   - 3-5 hours per week
   - 6-9 hours per week
   - 10-14 hours per week
   - 15 hours per week or more

2. Compared to other courses at this level, the amount I have learned in this course is:
   - Less
   - About the same
   - More
   - I have not taken other courses at this level

3. Compared to other courses at this level, the difficulty of this course is:
   - Less
   - About the same
   - More
   - I have not taken other courses at this level

4. I would recommend this course to other students.
   - Yes
   - No

5. I would recommend this instructor to other students.
   - Yes
   - No

Rate your instructor in terms of the following characteristics:

6. Is approachable
7. Makes effective use of course readings
8. Creates worthwhile assignments
9. Has a reasonable grading system

Course Environment

1. How would you rate the physical environment in which you take this class, especially the classroom facilities, including your ability to see, hear, concentrate and participate?

   Exceptional  Satisfactory  Very Poor

   - - - - - -
University of Minnesota Student Rating of Teaching

Your responses to this questionnaire are important because they will be used in tenure, promotion, and salary decisions for your instructor. Your thoughtful written comments are especially requested, and may help your instructor improve future course offerings. The results of this evaluation (including the evaluation forms) will not be returned to the instructor until after the final grades are submitted for this course. In addition to a No. 2 pencil, you may use a blue or black pen to complete this form. Completely fill in the oval of your choice. If you erase, erase completely. Multiple marks will result in the answer being omitted from the results.

INSTRUCTOR: Marc Riedel                         TERM: Fall 2009                         CURRENT YEAR: 2009
DEPARTMENT: Electrical Engineering              COURSE #: EE 301                         SECTION: 5

Carefully read each statement and select a response based on the following:
6-Strongly Agree 5-Agree 4-Somewhat Agree 3-Somewhat Disagree 2-Disagree 1-Strongly Disagree

1. The instructor was well prepared for class.
2. The instructor presented the subject matter clearly.
3. The instructor provided feedback intended to improve my course performance.
4. The instructor treated me with respect.
5. I have a deeper understanding of the subject matter as a result of this course.
6. My interest in the subject matter was stimulated by this course.

Written Comments
1. What did the instructor do that most helped your learning?
   "Presented the subject matter clearly and made sure everyone understood it."

2. What could you have done to be a better learner?
   "I could have gone to the extra prep sessions."

(Please use other side for additional comments.)

To preserve anonymity in small classes, the demographic section below will be cut off before the forms are returned to the instructor.

Cut Here
Written Comments

3. Additional Comments

Honesty, he was 100 times better than the lecture professor. Made the subject matter understandable. EE2301

Student Release Questions: These questions were selected by the Student Senate to provide future students with information about the course.

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Approximately how many hours per week do you spend working on homework, reading, and projects for this course?</td>
<td>○ 0-2 hours per week&lt;br&gt;○ 3-5 hours per week&lt;br&gt;○ 6-9 hours per week&lt;br&gt;○ 10-14 hours per week&lt;br&gt;○ 15 hours per week or more</td>
</tr>
<tr>
<td>2. Compared to other courses at this level, the amount I have learned in this course is:</td>
<td>○ Less&lt;br&gt;○ About the same&lt;br&gt;○ More&lt;br&gt;○ I have not taken other courses at this level</td>
</tr>
<tr>
<td>3. Compared to other courses at this level, the difficulty of this course is:</td>
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</tr>
<tr>
<td>4. I would recommend this course to other students.</td>
<td>○ Yes&lt;br&gt;○ No</td>
</tr>
<tr>
<td>5. I would recommend this instructor to other students.</td>
<td>○ Yes&lt;br&gt;○ No</td>
</tr>
<tr>
<td>6. Is approachable</td>
<td>Agree&lt;br&gt;Somewhat Agree&lt;br&gt;Somewhat Disagree&lt;br&gt;Disagree&lt;br&gt;Not Applicable</td>
</tr>
<tr>
<td>7. Makes effective use of course readings</td>
<td>Agree&lt;br&gt;Somewhat Agree&lt;br&gt;Somewhat Disagree&lt;br&gt;Disagree&lt;br&gt;Not Applicable</td>
</tr>
<tr>
<td>8. Creates worthwhile assignments</td>
<td>Agree&lt;br&gt;Somewhat Agree&lt;br&gt;Somewhat Disagree&lt;br&gt;Disagree&lt;br&gt;Not Applicable</td>
</tr>
<tr>
<td>9. Has a reasonable grading system</td>
<td>Agree&lt;br&gt;Somewhat Agree&lt;br&gt;Somewhat Disagree&lt;br&gt;Disagree&lt;br&gt;Not Applicable</td>
</tr>
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</table>

Course Environment

1. How would you rate the physical environment in which you take this class, especially the classroom facilities, including your ability to see, hear, concentrate and participate? Exceptional Satisfactory Very Poor 7 6 5 4 3 2 1
University of Minnesota Student Rating of Teaching

Your responses to this questionnaire are important because they will be used in tenure, promotion, and salary decisions for your instructor. Your thoughtful written comments are especially requested, and may help your instructor improve future course offerings. The results of this evaluation (including the evaluation forms) will not be returned to the instructor until after the final grades are submitted for this course. In addition to a No. 2 pencil, you may use a blue or black pen to complete this form. Completely fill in the oval of your choice. If you erase, erase completely. Multiple marks will result in the answer being omitted from the results.

INSTRUCTOR: Marc Rieckel  TERM: fall  CURRENT YEAR: 2009
DEPARTMENT: Electrical Engineering  COURSE #: EE 301  SECTION: 5

Carefully read each statement and select a response based on the following:
6-Strongly Agree  5-Agree  4-Somewhat Agree  3-Somewhat Disagree  2-Disagree  1-Strongly Disagree

1. The instructor was well prepared for class.
2. The instructor presented the subject matter clearly.
3. The instructor provided feedback intended to improve my course performance.
4. The instructor treated me with respect.
5. I have a deeper understanding of the subject matter as a result of this course.
6. My interest in the subject matter was stimulated by this course.

Written Comments

1. What did the instructor do that most helped your learning?

He thoroughly explained the topics that were mentioned in class and went more in-depth than the professor.

2. What could you have done to be a better learner?

I could have read the book and tried to understand the material before coming to class.

(Please use other side for additional comments.)

To preserve anonymity in small classes, the demographic section below will be cut off before the forms are returned to the instructor.
Written Comments
3. Additional Comments

Great professor! If he taught the class I probably would have done better.

Student Release Questions: These questions were selected by the Student Senate to provide future students with information about the course.

1. Approximately how many hours per week do you spend working on homework, reading, and projects for this course?
   - ○ 0-2 hours per week
   - ○ 3-5 hours per week
   - ○ 6-9 hours per week
   - ○ 10-14 hours per week
   - ○ 15 hours per week or more

2. Compared to other courses at this level, the amount I have learned in this course is:
   - ○ Less
   - ○ About the same
   - ○ More
   - ○ I have not taken other courses at this level

3. Compared to other courses at this level, the difficulty of this course is:
   - ○ Less
   - ○ About the same
   - ○ More
   - ○ I have not taken other courses at this level

4. I would recommend this course to other students.
   - ○ Yes
   - ○ No

5. I would recommend this instructor to other students.
   - ○ Yes
   - ○ No

Rate your instructor in terms of the following characteristics

6. Is approachable
   - ○ Agree
   - ○ Somewhat Agree
   - ○ Somewhat Disagree
   - ○ Disagree
   - ○ No applicable

7. Makes effective use of course readings
   - ○ Agree
   - ○ Somewhat Agree
   - ○ Somewhat Disagree
   - ○ Disagree
   - ○ No applicable

8. Creates worthwhile assignments
   - ○ Agree
   - ○ Somewhat Agree
   - ○ Somewhat Disagree
   - ○ Disagree
   - ○ No applicable

9. Has a reasonable grading system
   - ○ Agree
   - ○ Somewhat Agree
   - ○ Somewhat Disagree
   - ○ Disagree
   - ○ No applicable

Course Environment

1. How would you rate the physical environment in which you take this class, especially the classroom facilities, including your ability to see, hear, concentrate and participate?

   Exceptional   Satisfactory   Very Poor
   7  6  5  4  3  2  1

Cut Here
University of Minnesota Student Rating of Teaching

Your responses to this questionnaire are important because they will be used in tenure, promotion, and salary decisions for your instructor. Your thoughtful written comments are especially requested, and may help your instructor improve future course offerings.

The results of this evaluation (including the evaluation forms) will not be returned to the instructor until after the final grades are submitted for this course. In addition to a No. 2 pencil, you may use a blue or black pen to complete this form. Completely fill in the oval of your choice. If you erase, erase completely. Multiple marks will result in the answer being omitted from the results.

INSTRUCTOR: Marc Riedel
DEPARTMENT: EE
TERM: Fall 2009
COURSE #: 2301
SECTION: #005
CURRENT YEAR: 

Carefully read each statement and select a response based on the following:
6-Strongly Agree 5-Agree 4-Somewhat Agree 3-Somewhat Disagree 2-Disagree 1-Strongly Disagree

1. The instructor was well prepared for class.
2. The instructor presented the subject matter clearly.
3. The instructor provided feedback intended to improve my course performance.
4. The instructor treated me with respect.
5. I have a deeper understanding of the subject matter as a result of this course.
6. My interest in the subject matter was stimulated by this course.

Written Comments
1. What did the instructor do that most helped your learning?

   Explained everything very clearly.
   Went over lots of examples in detail

2. What could you have done to be a better learner?

(Please use other side for additional comments.)

To preserve anonymity in small classes, the demographic section below will be cut off before the forms are returned to the instructor.
Marc does an excellent job at explaining the material in EE 2301.
University of Minnesota Student Rating of Teaching

Your responses to this questionnaire are important because they will be used in tenure, promotion, and salary decisions for your instructor. Your thoughtful written comments are especially requested, and may help your instructor improve future course offerings. The results of this evaluation (including the evaluation forms) will not be returned to the instructor until after the final grades are submitted for this course. In addition to a No. 2 pencil, you may use a blue or black pen to complete this form. Completely fill in the oval of your choice. If you erase, erase completely. Multiple marks will result in the answer being omitted from the results.

INSTRUCTOR:  Marc Riedel  TERM:  Fall  CURRENT YEAR:  2009
DEPARTMENT:  IT  COURSE #:  2301  SECTION:  001

Carefully read each statement and select a response based on the following:
6-Strongly Agree  5-Agree  4-Somewhat Agree  3-Somewhat Disagree  2-Disagree
1-Strongly Disagree

1. The instructor was well prepared for class.
2. The instructor presented the subject matter clearly.
3. The instructor provided feedback intended to improve my course performance.
4. The instructor treated me with respect.
5. I have a deeper understanding of the subject matter as a result of this course.
6. My interest in the subject matter was stimulated by this course.

Written Comments
1. What did the instructor do that most helped your learning?

   Explained things very well and in terms anyone could understand! A+

2. What could you have done to be a better learner?

(Please use other side for additional comments.)

To preserve anonymity in small classes, the demographic section below will be cut off before the forms are returned to the instructor.
Written Comments

3. Additional Comments

Student Release Questions: These questions were selected by the Student Senate to provide future students with information about the course.

1. Approximately how many hours per week do you spend working on homework, reading, and projects for this course?
   - 0-2 hours per week
   - 3-5 hours per week
   - 6-9 hours per week
   - 10-14 hours per week
   - 15 hours per week or more

2. Compared to other courses at this level, the amount I have learned in this course is:
   - Less
   - About the same
   - More
   - I have not taken other courses at this level

3. Compared to other courses at this level, the difficulty of this course is:
   - Less
   - About the same
   - More
   - I have not taken other courses at this level

4. I would recommend this course to other students.
   - Yes
   - No

5. I would recommend this instructor to other students.
   - Yes
   - No

Rate your instructor in terms of the following characteristics:

- Agree
- Somewhat Agree
- Somewhat Disagree
- Disagree
- Not applicable

6. Is approachable
7. Makes effective use of course readings
8. Creates worthwhile assignments
9. Has a reasonable grading system

Course Environment

1. How would you rate the physical environment in which you take this class, especially the classroom facilities, including your ability to see, hear, concentrate and participate?
   - Exceptional
   - Satisfactory
   - Very Poor
   - 7 6 5 4 3 2 1

Cut Here
University of Minnesota Student Rating of Teaching

Your responses to this questionnaire are important because they will be used in tenure, promotion, and salary decisions for your instructor. Your thoughtful written comments are especially requested, and may help your instructor improve future course offerings. The results of this evaluation (including the evaluation forms) will not be returned to the instructor until after the final grades are submitted for this course. In addition to a No. 2 pencil, you may use a blue or black pen to complete this form. Completely fill in the oval of your choice. If you erase, erase completely. Multiple marks will result in the answer being omitted from the results.

INSTRUCTOR: Mark Riedel
TERM: Fall
CURRENT YEAR: 2009
DEPARTMENT: EE Electrical Engineering
COURSE #: 2301
SECTION: 1

Carefully read each statement and select a response based on the following:
6-Strongly Agree 5-Agree 4-Somewhat Agree 3-Somewhat Disagree 2-Disagree 1-Strongly Disagree

1. The instructor was well prepared for class.

2. The instructor presented the subject matter clearly.

3. The instructor provided feedback intended to improve my course performance.

4. The instructor treated me with respect.

5. I have a deeper understanding of the subject matter as a result of this course.

6. My interest in the subject matter was stimulated by this course.

Written Comments
1. What did the instructor do that most helped your learning?

He explained the theory really well that you would understand it right off the bat.

2. What could you have done to be a better learner?

Study some more.

(Please use other side for additional comments.)

To preserve anonymity in small classes, the demographic section below will be cut off before the forms are returned to the instructor.

Cut Here
Written Comments
3. Additional Comments

Excellent Instructor.

Student Release Questions: These questions were selected by the Student Senate to provide future students with information about the course.

1. Approximately how many hours per week do you spend working on homework, reading, and projects for this course?
   - 0-2 hours per week
   - 3-5 hours per week
   - 6-9 hours per week
   - 10-14 hours per week
   - 15 hours per week or more

2. Compared to other courses at this level, the amount I have learned in this course is:
   - Less
   - About the same
   - More
   - I have not taken other courses at this level

3. Compared to other courses at this level, the difficulty of this course is:
   - Less
   - About the same
   - More
   - I have not taken other courses at this level

4. I would recommend this course to other students.
   - Yes
   - No

5. I would recommend this instructor to other students.
   - Yes
   - No

Rate your instructor in terms of the following characteristics

6. Is approachable
7. Makes effective use of course readings
8. Creates worthwhile assignments
9. Has a reasonable grading system

Course Environment

1. How would you rate the physical environment in which you take this class, especially the classroom facilities, including your ability to see, hear, concentrate and participate?

   Exceptional   Satisfactory   Very Poor
   ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
University of Minnesota Student Rating of Teaching

Your responses to this questionnaire are important because they will be used in tenure, promotion, and salary decisions for your instructor. Your thoughtful written comments are especially requested, and may help your instructor improve future course offerings. The results of this evaluation (including the evaluation forms) will not be returned to the instructor until after the final grades are submitted for this course. In addition to a No. 2 pencil, you may use a blue or black pen to complete this form. Completely fill in the oval of your choice. If you erase, erase completely. Multiple marks will result in the answer being omitted from the results.

INSTRUCTOR: Marc Biede
DEPARTMENT: ECE
TERM: Fall
COURSE #: ECE 301
SECTION: 4
CURRENT YEAR: 2007

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Somewhat Agree</th>
<th>Somewhat Disagree</th>
<th>Disagree</th>
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</tr>
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<tbody>
<tr>
<td>1. The instructor was well prepared for class.</td>
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<td>2. The instructor presented the subject matter clearly.</td>
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<td>performance.</td>
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<td>4. The instructor treated me with respect.</td>
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<td>5. I have a deeper understanding of the subject matter as a result of</td>
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<td>this course.</td>
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</tbody>
</table>

Written Comments

1. What did the instructor do that most helped your learning?
   He gave good examples and some really good tips.

2. What could you have done to be a better learner?
   Studied more, give more time to this class.

(Please use other side for additional comments.)

To preserve anonymity in small classes, the demographic section below will be cut off before the forms are returned to the instructor.
Written Comments

3. Additional Comments

He's an great instructor. He really knows the material.

Student Release Questions: These questions were selected by the Student Senate to provide future students with information about the course.

1. Approximately how many hours per week do you spend working on homework, reading, and projects for this course?
   - 0-2 hours per week
   - 3-5 hours per week
   - 6-9 hours per week
   - 10-14 hours per week
   - 15 hours per week or more

2. Compared to other courses at this level, the amount I have learned in this course is:
   - Less
   - About the same
   - More
   - I have not taken other courses at this level

3. Compared to other courses at this level, the difficulty of this course is:
   - Less
   - About the same
   - More
   - I have not taken other courses at this level

4. I would recommend this course to other students.
   - Yes
   - No

5. I would recommend this instructor to other students.
   - Yes
   - No

Rate your instructor in terms of the following characteristics:

6. Is approachable
   - Agree
   - Somewhat Agree
   - Somewhat Disagree
   - Disagree
   - Not applicable

7. Makes effective use of course readings
   - Agree
   - Somewhat Agree
   - Somewhat Disagree
   - Disagree
   - Not applicable

8. Creates worthwhile assignments
   - Agree
   - Somewhat Agree
   - Somewhat Disagree
   - Disagree
   - Not applicable

9. Has a reasonable grading system
   - Agree
   - Somewhat Agree
   - Somewhat Disagree
   - Disagree
   - Not applicable

Course Environment

1. How would you rate the physical environment in which you take this class, especially the classroom facilities, including your ability to see, hear, concentrate and participate?
   - Exceptional
   - Satisfactory
   - Very Poor

Cut Here
University of Minnesota Student Rating of Teaching

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INSTRUCTOR: **RIEDEL**
TERM: **F11**
CURRENT YEAR: **2009**
DEPARTMENT: **ECE**
COURSE #: **EE301**
SECTION: **0041**

Carefully read each statement and select a response based on the following:
6-Strongly Agree 5-Agree 4-Somewhat Agree 3-Somewhat Disagree 2-Disagree 1-Strongly Disagree

1. The instructor was well prepared for class.
   - Strongly Agree
   - Somewhat Agree
   - Disagree
   - Strongly Disagree

2. The instructor presented the subject matter clearly.
   - Strongly Agree
   - Somewhat Agree
   - Disagree
   - Strongly Disagree

3. The instructor provided feedback intended to improve my course performance.
   - Strongly Agree
   - Somewhat Agree
   - Disagree
   - Strongly Disagree

4. The instructor treated me with respect.
   - Strongly Agree
   - Somewhat Agree
   - Disagree
   - Strongly Disagree

5. I have a deeper understanding of the subject matter as a result of this course.
   - Strongly Agree
   - Somewhat Agree
   - Disagree
   - Strongly Disagree

6. My interest in the subject matter was stimulated by this course.
   - Strongly Agree
   - Somewhat Agree
   - Disagree
   - Strongly Disagree

Written Comments

1. What did the instructor do that most helped your learning?
   - Instructor showed great enthusiasm for the material helping students to get excited and involved as well.

2. What could you have done to be a better learner?
   - Take more time for examples beyond simpler cases.

(Please use other side for additional comments.)

To preserve anonymity in small classes, the demographic section below will be cut off before the forms are returned to the instructor.
Written Comments
3. Additional Comments
Great Instructor

Student Release Questions: These questions were selected by the Student Senate to provide future students with information about the course.

1. Approximately how many hours per week do you spend working on homework, reading, and projects for this course?
   - 0-2 hours per week
   - 3-5 hours per week
   - 6-9 hours per week
   - 10-14 hours per week
   - 15 hours per week or more

2. Compared to other courses at this level, the amount I have learned in this course is:
   - Less
   - About the same
   - More
   - I have not taken other courses at this level

3. Compared to other courses at this level, the difficulty of this course is:
   - Less
   - About the same
   - More
   - I have not taken other courses at this level

4. I would recommend this course to other students.
   - Yes
   - No

5. I would recommend this instructor to other students.
   - Yes
   - No

Rate your instructor in terms of the following characteristics:

6. Is approachable
7. Makes effective use of course readings
8. Creates worthwhile assignments
9. Has a reasonable grading system

Course Environment

1. How would you rate the physical environment in which you take this class, especially the classroom facilities, including your ability to see, hear, concentrate and participate?

   Exceptional Satisfactory Very Poor
   ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
University of Minnesota Student Rating of Teaching

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INSTRUCTOR: Marc Rold
TERM: Fall
CURRENT YEAR: 2010
DEPARTMENT: EE
COURSE #: 2361
SECTION: 23

Carefully read each statement and select a response based on the following:
6-Strongly Agree 5-Agree 4-Somewhat Agree 3-Somewhat Disagree 2-Disagree
1-Strongly Disagree

1. The instructor was well prepared for class.
2. The instructor presented the subject matter clearly.
3. The instructor provided feedback intended to improve my course performance.
4. The instructor treated me with respect.
5. I have a deeper understanding of the subject matter as a result of this course.
6. My interest in the subject matter was stimulated by this course.

Written Comments

1. What did the instructor do that most helped your learning?
   Always very clearly explained concepts in an easy to understand manner.

2. What could you have done to be a better learner?
   Uhh... Study.

(Please use other side for additional comments.)
### Written Comments

3. Additional Comments

Great instructor!!! A+  

### Student Release Questions: These questions were selected by the Student Senate to provide future students with information about the course.

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<td>2. Compared to other courses at this level, the amount I have learned in this course is:</td>
<td>Less, About the same, More, I have not taken other courses at this level</td>
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<td>3. Compared to other courses at this level, the difficulty of this course is:</td>
<td>Less, About the same, More, I have not taken other courses at this level</td>
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<tr>
<td>4. I would recommend this course to other students.</td>
<td>Yes, No</td>
</tr>
<tr>
<td>5. I would recommend this instructor to other students.</td>
<td>Yes, No</td>
</tr>
<tr>
<td>Rate your instructor in terms of the following characteristics</td>
<td>Agree, Somewhat Agree, Somewhat Disagree, Disagree, Not applicable</td>
</tr>
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<td>6. Is approachable</td>
<td></td>
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<td>7. Makes effective use of course readings</td>
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<td>8. Creates worthwhile assignments</td>
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<td>9. Has a reasonable grading system</td>
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### Course Environment

1. How would you rate the physical environment in which you take this class, especially the classroom facilities, including your ability to see, hear, 

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<th>Very Poor</th>
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University of Minnesota Student Rating of Teaching

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INSTRUCTOR: Marc Riedel
TERM: Fall
CURRENT YEAR: 2010
DEPARTMENT: EE
COURSE #: 2301
SECTION: 23

Carefully read each statement and select a response based on the following:
6-Strongly Agree 5-Agree 4-Somewhat Agree 3-Somewhat Disagree 2-Disagree
1-Strongly Disagree

1. The instructor was well prepared for class.
   - Strongly Agree
   - Agree
   - Somewhat Agree
   - Somewhat Disagree
   - Strongly Disagree

2. The instructor presented the subject matter clearly.
   - Strongly Agree
   - Agree
   - Somewhat Agree
   - Somewhat Disagree
   - Strongly Disagree

3. The instructor provided feedback intended to improve my course performance.
   - Strongly Agree
   - Agree
   - Somewhat Agree
   - Somewhat Disagree
   - Strongly Disagree

4. The instructor treated me with respect.
   - Strongly Agree
   - Agree
   - Somewhat Agree
   - Somewhat Disagree
   - Strongly Disagree

5. I have a deeper understanding of the subject matter as a result of this course.
   - Strongly Agree
   - Agree
   - Somewhat Agree
   - Somewhat Disagree
   - Strongly Disagree

6. My interest in the subject matter was stimulated by this course.
   - Strongly Agree
   - Agree
   - Somewhat Agree
   - Somewhat Disagree
   - Strongly Disagree

Written Comments

1. What did the instructor do that most helped your learning?
   - Tailored lectures to needs of the student

2. What could you have done to be a better learner?
   - Adoral

(Please use other side for additional comments.)
### Written Comments

3. Additional Comments

- Awesome professor! Appreciated the enthusiasm and obvious enjoyment of teaching and helping students learn along with providing them with ideas for interesting topics to consider.

### Student Release Questions:

These questions were selected by the Student Senate to provide future students with information about the course.

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
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<td>1. Approximately how many hours per week do you spend working on homework, reading, and projects for this course?</td>
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<td>2. Compared to other courses at this level, the amount I have learned in this course is:</td>
<td>- Less&lt;br&gt;- About the same&lt;br&gt;- More&lt;br&gt;- I have not taken other courses at this level</td>
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<td>Rate your instructor in terms of the following characteristics</td>
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<td>7. Makes effective use of course readings</td>
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<tr>
<td>9. Has a reasonable grading system</td>
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### Course Environment

1. How would you rate the physical environment in which you take this class, especially the classroom facilities, including your ability to see, hear,
University of Minnesota Student Rating of Teaching

Your responses to this questionnaire are important because they will be used in tenure, promotion, and salary decisions for your instructor. Your thoughtful written comments are especially requested, and may help your instructor improve future course offerings. The results of this evaluation (including the evaluation forms) will not be returned to the instructor until after the final grades are submitted for this course. In addition to a No. 2 pencil, you may use a blue or black pen to complete this form. Completely fill in the oval of your choice. If you erase, erase completely. Multiple marks will result in the answer being omitted from the results.

INSTRUCTOR: Mark Riedel  TERM: Fall  COURSE #: 2301  SECTION: 

DEPARTMENT: EE  CURRENT YEAR: 2010

Carefully read each statement and select a response based on the following:

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Somewhat Agree</th>
<th>Somewhat Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
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<tr>
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1. The instructor was well prepared for class.
2. The instructor presented the subject matter clearly.
3. The instructor provided feedback intended to improve my course performance.
4. The instructor treated me with respect.
5. I have a deeper understanding of the subject matter as a result of this course.
6. My interest in the subject matter was stimulated by this course.

Written Comments

1. What did the instructor do that most helped your learning?

2. What could you have done to be a better learner?

(Please use other side for additional comments.)
### Written Comments

3. Additional Comments

Mark is the best teacher I've had so far at the U of M.

---

### Student Release Questions: These questions were selected by the Student Senate to provide future students with information about the course.

1. Approximately how many hours per week do you spend working on homework, reading, and projects for this course?
   - [ ] 0-2 hours per week
   - [ ] 3-5 hours per week
   - [ ] 6-9 hours per week
   - [ ] 10-14 hours per week
   - [ ] 15 hours per week or more

2. Compared to other courses at this level, the amount I have learned in this course is:
   - [ ] Less
   - [ ] About the same
   - [ ] More
   - [ ] I have not taken other courses at this level

3. Compared to other courses at this level, the difficulty of this course is:
   - [ ] Less
   - [ ] About the same
   - [ ] More
   - [ ] I have not taken other courses at this level

4. I would recommend this course to other students.
   - [ ] Yes
   - [ ] No

5. I would recommend this instructor to other students.
   - [ ] Yes
   - [ ] No

6. Is approachable
   - Agree
   - Slightly Agree
   - Somewhat Agree
   - Disagree
   - Not Applicable

7. Makes effective use of course readings
   - Agree
   - Slightly Agree
   - Somewhat Agree
   - Disagree
   - Not Applicable

8. Creates worthwhile assignments
   - Agree
   - Slightly Agree
   - Somewhat Agree
   - Disagree
   - Not Applicable

9. Has a reasonable grading system
   - Agree
   - Slightly Agree
   - Somewhat Agree
   - Disagree
   - Not Applicable

---

### Course Environment

1. How would you rate the physical environment in which you take this class, especially the classroom facilities, including your ability to see, hear, Exceptional    Satisfactory    Very Poor
University of Minnesota Student Rating of Teaching

INSTRUCTOR:  Marc Riebel  TERM:  Spring  CURRENT YEAR:  2008
DEPARTMENT:  EE  COURSE #:  37940  SECTION:  

Carefully read each statement and select a response based on the following: 6-Strongly Agree 5-Agree 4-Somewhat Agree 3-Somewhat Disagree 2-Disagree 1-Strongly Disagree

1. The instructor was well prepared for class.
2. The instructor presented the subject matter clearly.
3. The instructor provided feedback intended to improve my course performance.
4. The instructor treated me with respect.
5. I have a deeper understanding of the subject matter as a result of this course.
6. My interest in the subject matter was stimulated by this course.

Written Comments
1. What did the instructor do that most helped your learning?
   Gave excellent analogies, which was very essential because of inherently abstract topic.

2. What could you have done to be a better learner?
   Put in more hours in research kind of study than simply HW’s & assignments.

(Please use other side for additional comments.)

To preserve anonymity in small classes, the demographic section below will be cut off before the forms are returned to the instructor. Additionally, summary reports will not be sent to the instructor for any category containing fewer than five students.
Written Comments
3. Additional Comments

excellent & fun course.

Student Release Questions: These questions were selected by the Student Senate to provide future students with information about the course.

1. Approximately how many hours per week do you spend working on homework, reading, and projects for this course?
   - 0-2 hours per week
   - 3-5 hours per week
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   - 15 hours per week or more

2. Compared to other courses at this level, the amount I have learned in this course is:
   - Less
   - About the same
   - More
   - I have not taken other courses at this level

3. Compared to other courses at this level, the difficulty of this course is:
   - Less
   - About the same
   - More
   - I have not taken other courses at this level

4. I would recommend this course to other students.
   - Yes
   - No

5. I would recommend this instructor to other students.
   - Yes
   - No

Rate your instructor in terms of the following characteristics:

6. Is approachable
7. Makes effective use of course readings
8. Creates worthwhile assignments
9. Has a reasonable grading system

Course Environment
1. How would you rate the physical environment in which you take this class, especially the classroom facilities, including your ability to see, hear, concentrate and participate?

   Exceptional    Satisfactory    Very Poor
   O  O  O  O  O  O  O  O
University of Minnesota Student Rating of Teaching

Your responses to this questionnaire are important because they will be used in tenure, promotion, and salary decisions for your instructor. Your thoughtful written comments are especially requested, and may help your instructor improve future course offerings. The results of this evaluation (including the evaluation forms) will not be returned to the instructor until after the final grades are submitted for this course. In addition to a No. 2 pencil, you may use a blue or black pen to complete this form. Completely fill in the oval of your choice. If you erase, erase completely. Multiple marks will result in the answer being omitted from the results.

INSTRUCTOR: Marc Riedl
TERM: Spring
CURRENT YEAR: 2011

DEPARTMENT: EE - CSE
COURSE #: 8593
SECTION: 001

Carefully read each statement and select a response based on the following:
6-Strongly Agree 5-Agree 4-Somewhat Agree 3-Somewhat Disagree 2-Disagree 1-Strongly Disagree

1. The instructor was well prepared for class.
2. The instructor presented the subject matter clearly.
3. The instructor provided feedback intended to improve my course performance.
4. The instructor treated me with respect.
5. I have a deeper understanding of the subject matter as a result of this course.
6. My interest in the subject matter was stimulated by this course.

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Written Comments

1. What did the instructor do that most helped your learning?

I really like Marc's teaching style, and he is always open to answering questions. I liked the online videos a lot!!

2. What could you have done to be a better learner?

Spent more time trying to do the hw in programming.

(Please use other side for additional comments.)

To preserve anonymity in small classes, the demographic section below will be cut off before the forms are returned to the instructor.
3. Additional Comments

Thanks so much for a wonderful semester, I enjoyed hanging out! Your teaching is great, keep up your research!

---

**Written Comments**

**Student Release Questions:** These questions were selected by the Student Senate to provide future students with information about the course.

1. Approximately how many hours per week do you spend working on homework, reading, and projects for this course?
   - [ ] 0-2 hours per week
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2. Compared to other courses at this level, the amount I have learned in this course is:
   - [ ] Less
   - [ ] About the same
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3. Compared to other courses at this level, the difficulty of this course is:
   - [ ] Less
   - [ ] About the same
   - [ ] More
   - [ ] I have not taken other courses at this level

4. I would recommend this course to other students.
   - [ ] Yes
   - [ ] No

5. I would recommend this instructor to other students.
   - [ ] Yes
   - [ ] No

6. Is approachable

7. Makes effective use of course readings

8. Creates worthwhile assignments

9. Has a reasonable grading system

---

**Course Environment**

1. How would you rate the physical environment in which you take this class, especially the classroom facilities, including your ability to see, hear, concentrate and participate?
   - [ ] Exceptional
   - [ ] Satisfactory
   - [ ] Very Poor

   ![Rating Scale](rating_scale.png)
University of Minnesota Student Rating of Teaching

INSTRUCTOR: Marc Riedel
TERM: Spring
CURRENT YEAR: 2011
DEPARTMENT: EE
COURSE #: 5393
SECTION:

Carefully read each statement and select a response based on the following: 6-Strongly Agree 5-Agree 4-Somewhat Agree 3-Somewhat Disagree 2-Disagree 1-Strongly Disagree

<table>
<thead>
<tr>
<th>Statement</th>
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Written Comments

1. What did the instructor do that most helped your learning?
   - Homework's and quizzes
   - Ask questions to students about class

2. What could you have done to be a better learner?
   - Spend more time in homeworks

(Please use other side for additional comments.)

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Written Comments
3. Additional Comments

Great professor!

Student Release Questions: These questions were selected by the Student Senate to provide future students with information about the course.

1. Approximately how many hours per week do you spend working on homework, reading, and projects for this course?
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3. Compared to other courses at this level, the difficulty of this course is:
   - Less
   - About the same
   - More
   - I have not taken other courses at this level

4. I would recommend this course to other students.
   - Yes
   - No

5. I would recommend this instructor to other students.
   - Yes
   - No

Rate your instructor in terms of the following characteristics:

6. Is approachable
7. Makes effective use of course readings
8. Creates worthwhile assignments
9. Has a reasonable grading system

Course Environment

1. How would you rate the physical environment in which you take this class, especially the classroom facilities, including your ability to see, hear, concentrate and participate?

   Exceptional  Satisfactory  Very Poor
   7  6  5  4  3  2  1

Cut Here
University of Minnesota Student Rating of Teaching

INSTRUCTOR: Prof. Marc Riedel  TERM: SPRING 2011  CURRENT YEAR: 2011
DEPARTMENT: Electrical Engineering  COURSE #: COMP 521  SECTION: E BIOL

Carefully read each statement and select a response based on the following: 6-Straightly Agree 5-Agree 4-Somewhat Agree 3-Somewhat Disagree 2-Disagree 1-Strongly Disagree

<table>
<thead>
<tr>
<th>Statement</th>
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<th>Agree</th>
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</table>

Written Comments
1. What did the instructor do that most helped your learning?
   - Good slides
   - Instructor well prepared for the class
   - Interactive lectures
   - Instructors very approachable

2. What could you have done to be a better learner?
   Prepare myself before the class. Read extra more papers.

(Please use other side for additional comments.)

To preserve anonymity in small classes, the demographic section below will be cut off before the forms are returned to the instructor. Additionally, summary reports will not be sent to the instructor for any category containing fewer than five students.
Written Comments
3. Additional Comments

This course should be offered every semester.

Student Release Questions: These questions were selected by the Student Senate to provide future students with information about the course.

1. Approximately how many hours per week do you spend working on homework, reading, and projects for this course?
   - 0-2 hours per week
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2. Compared to other courses at this level, the amount I have learned in this course is:
   - Less
   - About the same
   - More
   - I have not taken other courses at this level

3. Compared to other courses at this level, the difficulty of this course is:
   - Less
   - About the same
   - More
   - I have not taken other courses at this level

4. I would recommend this course to other students.
   - Yes
   - No

5. I would recommend this instructor to other students.
   - Yes
   - No

Rate your instructor in terms of the following characteristics:

6. Is approachable
7. Makes effective use of course readings
8. Creates worthwhile assignments
9. Has a reasonable grading system

Course Environment

1. How would you rate the physical environment in which you take this class, especially the classroom facilities, including your ability to see, hear, concentrate and participate?

   Exceptional       Satisfactory       Very Poor
   ☐ ☐ ☐ ☐ ☐
University of Minnesota Student Rating of Teaching

INSTRUCTOR: Marc Riedel
DEPARTMENT: EE
TERM: Spring
COURSE #: 5393
SECTION: 
CURRENT YEAR: 2011

Carefully read each statement and select a response based on the following: 6-Strongly Agree 5-Agree 4-Somewhat Agree 3-Somewhat Disagree 2-Disagree 1-Strongly Disagree

1. The instructor was well prepared for class.
2. The instructor presented the subject matter clearly.
3. The instructor provided feedback intended to improve my course performance.
4. The instructor treated me with respect.
5. I have a deeper understanding of the subject matter as a result of this course.
6. My interest in the subject matter was stimulated by this course.

Written Comments

1. What did the instructor do that most helped your learning?

   Everything.

2. What could you have done to be a better learner?

   Try to think about more.

(Please use other side for additional comments.)

To preserve anonymity in small classes, the demographic section below will be cut off before the forms are returned to the instructor. Additionally, summary reports will not be sent to the instructor for any category containing fewer than five students.
### Written Comments

3. Additional Comments

Very good course.

### Student Release Questions:

These questions were selected by the Student Senate to provide future students with information about the course.

1. Approximately how many hours per week do you spend working on homework, reading, and projects for this course?
   - [ ] 0-2 hours per week
   - [ ] 3-5 hours per week
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2. Compared to other courses at this level, the amount I have learned in this course is:
   - [ ] Less
   - [ ] About the same
   - [ ] More
   - [ ] I have not taken other courses at this level

3. Compared to other courses at this level, the difficulty of this course is:
   - [ ] Less
   - [ ] About the same
   - [ ] More
   - [ ] I have not taken other courses at this level

4. I would recommend this course to other students.
   - [ ] Yes
   - [ ] No

5. I would recommend this instructor to other students.
   - [ ] Yes
   - [ ] No

Rate your instructor in terms of the following characteristics:

- [ ] Agree
- [ ] Somewhat Agree
- [ ] Somewhat Disagree
- [ ] Disagree
- [ ] Not applicable

6. Is approachable
7. Makes effective use of course readings
8. Creates worthwhile assignments
9. Has a reasonable grading system

### Course Environment

1. How would you rate the physical environment in which you take this class, especially the classroom facilities, including your ability to see, hear, concentrate and participate?

   - [ ] Exceptional
   - [ ] Satisfactory
   - [ ] Very Poor
**University of Minnesota Student Rating of Teaching**

**INSTRUCTOR:** MARC RIEDEL  
**TERM:** SPRING 2011  
**CURRENT YEAR:**  
**DEPARTMENT:** ECE  
**COURSE #:** ECE 5293  
**SECTION:**  

Carefully read each statement and select a response based on the following: 6-Strongly Agree 5-Agree 4-Somewhat Agree 3-Somewhat Disagree 2-Disagree 1-Strongly Disagree

<table>
<thead>
<tr>
<th></th>
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<td>1. The instructor was well prepared for class.</td>
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<td>2. The instructor presented the subject matter clearly.</td>
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<td>![Score]</td>
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</table>

**Written Comments**

1. What did the instructor do that most helped your learning?

   Presented the matter very clearly and lucidly

2. What could you have done to be a better learner?

   Done more HW before every lecture

(Please use other side for additional comments.)

To preserve anonymity in small classes, the demographic section below will be cut off before the forms are returned to the instructor. Additionally, summary reports will not be sent to the instructor for any category containing fewer than five students.
Written Comments
3. Additional Comments

The best professor ever!
I wish he takes more ... courses.

Student Release Questions: These questions were selected by the Student Senate to provide future students with information about the course.

1. Approximately how many hours per week do you spend working on homework, reading, and projects for this course? 
   - 0-2 hours per week
   - 3-5 hours per week
   - 6-9 hours per week
   - 10-14 hours per week
   - 15 hours per week or more

2. Compared to other courses at this level, the amount I have learned in this course is:
   - Less
   - About the same
   - More
   - I have not taken other courses at this level

3. Compared to other courses at this level, the difficulty of this course is:
   - Less
   - About the same
   - More
   - I have not taken other courses at this level

4. I would recommend this course to other students.
   - Yes
   - No

5. I would recommend this instructor to other students.
   - Yes (Most definitely)
   - No

Rate your instructor in terms of the following characteristics:

6. Is approachable
7. Makes effective use of course readings
8. Creates worthwhile assignments
9. Has a reasonable grading system

Course Environment
1. How would you rate the physical environment in which you take this class, especially the classroom facilities, including your ability to see, hear, concentrate and participate?

   - Exceptional
   - Satisfactory
   - Very Poor
B.2.8 Syllabus: EE 1301 Introduction to Computing Systems

Instructor

<table>
<thead>
<tr>
<th>Instructor</th>
<th>Email</th>
<th>Tel.</th>
<th>Office</th>
<th>Office Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prof. Marc Riedel</td>
<td><a href="mailto:mriedel@umn.edu">mriedel@umn.edu</a></td>
<td>612-625-6086</td>
<td>EE/CSci 4-167</td>
<td>Mon. 4:00–6:00pm (or stop by my office anytime)</td>
</tr>
</tbody>
</table>

Teaching Assistants

<table>
<thead>
<tr>
<th>T.A.</th>
<th>Email</th>
<th>Tel.</th>
<th>Office</th>
<th>Office Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jing Wang (lab)</td>
<td><a href="mailto:wang0935@umn.edu">wang0935@umn.edu</a></td>
<td>None</td>
<td>by email</td>
<td>None</td>
</tr>
<tr>
<td>Micah Hakala (grading)</td>
<td><a href="mailto:hakal035@umn.edu">hakal035@umn.edu</a></td>
<td>None</td>
<td>EE/CSci 2-127</td>
<td>Wed. 12:15–2:15pm</td>
</tr>
</tbody>
</table>

Course Information

**Lecture:** 2:30pm – 3:45pm, Tuesdays and Thursdays, Fall 2011, in Keller Hall 3-111

**Final Exam:** 8:00am – 10:00am Monday, Dec. 19, 2011, in Keller Hall 3-111 (regular classroom)

**Prerequisites:** None

Motivation

Most introductory computer courses focus on high-level language programming. They typically take an “information hiding” approach that abstracts away all of the interesting details of the underlying computer system. While this type of abstraction can be a very useful technique for enhancing productivity, it is most helpful after you understand the fundamental concepts of a computing system, such as data representation, the operation of memory, and so forth. Without this fundamental knowledge, the information hiding approach actually inhibits understanding. You are too often left wondering how everything fits together, which leads to rote memorization instead of real comprehension. In contrast to this highly abstract, top-down approach, this course presents a bottom-up view that addresses a broad foundation of topics in computing systems. This more concrete view helps remove the mystery about how a computer actually works by anchoring every new concept to a continually developing foundation. As a result, nothing in the computer system appears to happen as if by magic.

Objectives

This course will introduce the fundamental concepts of computing systems, from the machine level to high-level language programming, including transistors and logic circuits, memory and pointer addressing, binary arithmetic and data representation, data types and structures, and assembly language and C programming. It is intended to be taken by first-year students in computer engineering, electrical engineering, and computer science, although students from other disciplines may find it interesting as well.
**Required texts**


- Kathy Buchheit, “Guide to Using the LC-3 Simulator.” Available online.

**Recommended text**

- Brian Kernighan and Dennis Ritchie, “The C Programming Language.”

**Class E-mail List**

All registered students should be on the list. If you haven’t been receiving class emails, please send an email to listserv@lists.umn.edu with a single line of text:

```
SUBSCRIBE ee1301-list Joe Blow
```

(where “Joe Blow” is your name). Leave the subject line blank.

**Computer Accounts**

You will have access to the IT workstation labs for use in this class. If you don’t already have an account, see [http://www.itlabs.umn.edu](http://www.itlabs.umn.edu) for information about initiating your account.

**Software**


- You can get a copy of the LC-3 Simulator (for free) at [http://highered.mcgraw-hill.com/sites/0072467509/student_view0/lc-3_simulator.html](http://highered.mcgraw-hill.com/sites/0072467509/student_view0/lc-3_simulator.html).

**Grading**

The course grade will be assigned according to the following weighting:

- Labs: **30%**
- Quizzes: **40%**
- Final Exam: **30%**

Your lowest quiz score will be thrown out when computing final grades. Furthermore, the 100% mark will be reduced to be the average of the total weighted score obtained by the top 5% of the class. Letter grades will be assigned according to the following scale:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>≥ 94%</td>
</tr>
<tr>
<td>A-</td>
<td>≥ 88%</td>
</tr>
<tr>
<td>B+</td>
<td>≥ 82%</td>
</tr>
<tr>
<td>B</td>
<td>≥ 76%</td>
</tr>
<tr>
<td>B-</td>
<td>≥ 70%</td>
</tr>
<tr>
<td>C+</td>
<td>≥ 64%</td>
</tr>
<tr>
<td>C</td>
<td>≥ 58%</td>
</tr>
<tr>
<td>C-</td>
<td>≥ 52%</td>
</tr>
<tr>
<td>D+</td>
<td>≥ 46%</td>
</tr>
<tr>
<td>D</td>
<td>≥ 40%</td>
</tr>
<tr>
<td>F</td>
<td>&lt; 40%</td>
</tr>
</tbody>
</table>
Even though the grading is quantitative and objective, we’re required to state the university grading standards. According to University policy, grades are assigned with the following meaning:

- **A** – Achievement that is outstanding relative to the level necessary to meet course requirements.
- **B** – Achievement that is significantly above the level necessary to meet course requirements.
- **C** – Achievement that meets the course requirements in every respect.
- **D** – Achievement that is worthy of credit even though it fails to meet fully the course requirements.
- **S** – Achievement that is satisfactory (equivalent to a C or better).
- **F (or N)** – Represents failure (or no credit) and signifies that the work was either completed, but at a level of achievement that is not worthy of credit, or was not completed and there was no agreement between the instructor and the student that the student would be awarded an incomplete.
- **I** (Incomplete) – Assigned at the discretion of the instructor when, due to extraordinary circumstances, a student is prevented from completing the work of the course on time. Assignment of an “I” grade requires a written agreement between the instructor and the student. “Extraordinary circumstances” are such things as hospitalization, serious car accidents, and major illnesses. They do not include excuses such as “working too much,” “took too many credits,” and so forth. Furthermore, an “I” can be assigned only when a small portion of the course remains to be completed.

**Credits and Workload Expectations**

For undergraduate courses, one credit is defined as equivalent to an average of three hours of learning effort per week (over a full semester) necessary for an average student to achieve an average grade in the course. For example, an average student expecting to get an average grade in a three-credit course that meets for three hours a week should expect to spend an additional six hours a week on course-work outside the classroom. If you want to earn a better-than-average grade, you most likely are going to need to spend even more time working on the course outside of the classroom or the lab.

**Course Policies**

- You are responsible for all assigned readings and all information presented in class, including any changes in due dates, assignments, and exams.
- You are expected to attend all of the class meetings and to attend the lab/discussion section for which you are registered.
- You are not permitted to submit extra work in an attempt to raise your grade.
- Students with disabilities that affect their ability to participate fully in class or to meet all course requirements are encouraged to bring this to the attention of the instructor so that appropriate accommodations can be arranged. Further information is available from the Disability Services office.
Homework and Lab Policies

- All homework and lab assignments will be posted on the class webpage. No paper copies will be distributed in class.

- All assignments are due at the time indicated in the assignment description. *Late assignments will receive a reduction of 15% of the maximum possible score for each 24-hour period that they are late*, except for documented illnesses and family emergencies.

- Any questions about the grading of homework, projects, or exams must be brought to the attention of your TA or the instructor within one week after the item in question is returned. Your request must include a short written summary describing your concern.

- You will be evaluated individually to determine your final course grade, and all quizzes and exams are to be taken individually. However, we encourage you to discuss lab assignments with your fellow students.

Academic Dishonesty

Academic dishonesty is broadly defined as: “Any act that violates the rights of another student in academic work or that involves misrepresentation of your own work. Scholastic dishonesty includes, but is not necessarily limited to: cheating on assignments or exams; plagiarizing, which means misrepresenting as your own work any part of work done by another; submitting the same paper, or substantially similar papers, to meet the requirements of more than one course without the approval and consent of all instructors concerned; depriving another student of necessary course materials; or interfering with another student’s work.” Academic dishonesty in any portion of the academic work for a course shall be grounds for awarding a grade of F (or N) for the entire course.

Course Topics

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sept. 6</td>
<td>Number systems, Boolean Algebra, Logic Gates</td>
<td>1</td>
</tr>
<tr>
<td>Sept. 8</td>
<td>Probability, Graph Theory, Combinatorics</td>
<td>None</td>
</tr>
<tr>
<td>Sept. 13</td>
<td>Course Logistics, Intro to C Programming – Part I</td>
<td>2.1, 2.4, 11</td>
</tr>
<tr>
<td>Sept. 15</td>
<td>Intro to C Programming – Part II</td>
<td>12.1 – 12.3</td>
</tr>
<tr>
<td>Sept. 20</td>
<td>From Transistors to Gates to Logic Functions; Bit-level operations in C</td>
<td>3.1 – 3.3, 12.3.5</td>
</tr>
<tr>
<td>Sept. 22</td>
<td>Combinational and Sequential Circuits</td>
<td>3.3, 3.6</td>
</tr>
<tr>
<td>Sept. 27</td>
<td>von Neumann model</td>
<td>4.1</td>
</tr>
<tr>
<td>Sept. 29</td>
<td><strong>Quiz 1</strong>; also LC-3 processor</td>
<td>5</td>
</tr>
<tr>
<td>Oct. 4</td>
<td>LC-3 processor</td>
<td>5</td>
</tr>
<tr>
<td>Date</td>
<td>Topic</td>
<td>Reading</td>
</tr>
<tr>
<td>----------</td>
<td>----------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Oct. 6</td>
<td>A little more logic design; a little more C</td>
<td>3.3, 12.1 – 12.3</td>
</tr>
<tr>
<td>Oct. 11</td>
<td>Recursion, Sorting in Software</td>
<td>17.1 – 17.3</td>
</tr>
<tr>
<td>Oct. 13</td>
<td>Sorting in Hardware</td>
<td>Lecture Notes</td>
</tr>
<tr>
<td>Oct. 18</td>
<td>Assembly</td>
<td>7.1 – 7.4</td>
</tr>
<tr>
<td>Oct. 20</td>
<td><strong>Quiz 2.</strong> More Assembly</td>
<td>7.1 – 7.4</td>
</tr>
<tr>
<td>Oct. 25</td>
<td>Traps</td>
<td>9.1</td>
</tr>
<tr>
<td>Oct. 27</td>
<td>Subroutines</td>
<td>9.2</td>
</tr>
<tr>
<td>Nov. 1</td>
<td><strong>Quiz 3;</strong> also Stack</td>
<td>10</td>
</tr>
<tr>
<td>Nov. 3</td>
<td>Stack (cont.)</td>
<td>10</td>
</tr>
<tr>
<td>Nov. 15</td>
<td>Overview of Computer Architecture</td>
<td>Lecture Notes</td>
</tr>
<tr>
<td>Nov. 17</td>
<td>Intro to C redux; recursion</td>
<td>11, 17</td>
</tr>
<tr>
<td>Nov. 18</td>
<td>Conditionals and Iteration.</td>
<td>13</td>
</tr>
<tr>
<td>Nov. 22</td>
<td>Functions.</td>
<td>14</td>
</tr>
<tr>
<td>Nov. 29</td>
<td><strong>Quiz 4</strong></td>
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</tr>
<tr>
<td>Dec. 1</td>
<td>Pointers.</td>
<td>16.1 – 16.2</td>
</tr>
<tr>
<td>Dec. 6</td>
<td>Arrays</td>
<td>16.3</td>
</tr>
<tr>
<td>Dec. 8</td>
<td>Data structures</td>
<td>19.1 – 19.3</td>
</tr>
<tr>
<td>Dec. 13</td>
<td><strong>Quiz 5;</strong> also Review</td>
<td></td>
</tr>
<tr>
<td>Dec. 15</td>
<td>Lists, queues, graphs</td>
<td>19.5</td>
</tr>
<tr>
<td>Dec. 19</td>
<td><strong>Final Exam, 8:00am – 10:00am</strong></td>
<td>None</td>
</tr>
</tbody>
</table>

*Reading assignments refer to chapters and sections in the textbook by Patt and Patel.*
B.2.9 Syllabus: EE 2301, Introduction to Digital System Design

<table>
<thead>
<tr>
<th>Instructor</th>
<th>Email</th>
<th>Tel.</th>
<th>Office</th>
<th>Office Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prof. Marc Riedel</td>
<td><a href="mailto:mriedel@umn.edu">mriedel@umn.edu</a></td>
<td>612-625-6086</td>
<td>EE/CSci 4-167 EE/CSci</td>
<td>Thurs. 11:00am – 1:00pm (or stop by my office anytime)</td>
</tr>
</tbody>
</table>

Teaching Assistants

<table>
<thead>
<tr>
<th>T.A.</th>
<th>Email</th>
<th>Tel.</th>
<th>Office</th>
<th>Office Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Andrew Zyllo (lab)</td>
<td><a href="mailto:zyllo001@umn.edu">zyllo001@umn.edu</a></td>
<td>None</td>
<td>by email</td>
<td>None</td>
</tr>
<tr>
<td>Jialie Hu (grading)</td>
<td><a href="mailto:hujialie@umn.edu">hujialie@umn.edu</a></td>
<td>None</td>
<td>EE/CSci 2-127</td>
<td>Wed. 10:00am–12:00pm</td>
</tr>
</tbody>
</table>

Lecture: Tu. & Th. 9:45am – 11:00am, Spring 2009, EE/CS 3-230

Discussions:

EE 301 Section 1: Tues. 11:15am–12:05pm EE/CS 4-138
EE 301 Section 3: Tues. 12:20pm–1:10pm EE/CS 4-138
EE 301 Section 4: Tues. 1:25pm–2:15pm EE/CS 4-138

Labs:

Section 3: Wed. 1:25pm–3:20pm EE/CS 2-178
Section 4: Thur. 3:35pm–5:30pm EE/CS 2-178
Section 5: Thur. 11:15am–1:10pm EE/CS 2-178
Section 6: Thur. 1:25pm–03:20pm EE/CS 2-178

Objectives:

The course introduces the students to the theory and the practice of digital system design, covering topics such as Boolean algebra, logic gates, combinational logic, logic simplification, sequential logic, design of synchronous sequential logic, VHDL modeling, and design of logic circuits lab.


Lab Manual: The parts you need for the laboratory are available as a laboratory kit in the ECE stockroom. The kit is a combination of the parts for the EE 2301 lab and the parts for the 2002/2006/3101/3102 labs.
Grading:
The course grade will be assigned according to the following weighting:

- Labs: 20%
- Homeworks: 20%
- Exams: 60%

Laboratory:

- Attendance: 10%
- Prelab: 10%
- Report: 60%
- Evaluation of Lab Work: 20%

Exams:

- Midterm Exam 1 (Thur., March 5, 9:45am – 11:00am, ECE 3-230): 15%
- Midterm Exam 2 (Thur., April 16, 9:45am – 11:00am, ECE 3-230): 15%
- Final Exam (Tues. May 12, 10:30am – 12:30pm, ECE 3-230): 30%

Policies:

- Exams are closed-book (no notes allowed), held in class.
- Calculators, phones, computers, or any other electronic devices may not be used in the exams.
- There will be no make-up exams except for verifiable illness or incapacity, approved by the university.
- An incomplete grade will only be given when all but a small portion of the coursework is complete and the student is unable to finish because of verifiable illness or incapacity, approved by the university. See the the University Senate Grading Policy: [http://www.fpd.finop.umn.edu/groups/senate/documents/policy/gradingpolicy.html](http://www.fpd.finop.umn.edu/groups/senate/documents/policy/gradingpolicy.html)
- All work submitted for the course must be the sole work of the student. Any student who copies from another or cheats in any manner will receive a 0 for that assignment/exam with the possibility of more severe punishment, such as receiving an “F” for the course or expulsion. See the University’s Student Conduct Policies: [http://www1.umn.edu/regents/policies/academic/StudentConduct.html](http://www1.umn.edu/regents/policies/academic/StudentConduct.html). Also, see the Institute of Technology’s Policies regarding dishonest and disruptive behavior: [http://www.it.umn.edu/students/policies/index.html](http://www.it.umn.edu/students/policies/index.html)
## Course Topics

<table>
<thead>
<tr>
<th>Weeks</th>
<th>General Topic</th>
<th>Specific Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Introduction to Digital Logic</td>
<td>Gates</td>
</tr>
<tr>
<td></td>
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<td>Combinational Circuits</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Boolean Expressions</td>
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<tr>
<td></td>
<td></td>
<td>Representation of Boolean Functions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Truth Tables</td>
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<tr>
<td></td>
<td></td>
<td>Two-Level Forms (AND/OR/NAND/NOR)</td>
</tr>
<tr>
<td></td>
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<td>“Don’t Cares”</td>
</tr>
<tr>
<td>2</td>
<td>Logic Minimization</td>
<td>Karnaugh maps</td>
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<td></td>
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<td>Quine-McCluskey Method</td>
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<td></td>
<td></td>
<td>Joint Minimization of Multiple Functions</td>
</tr>
<tr>
<td>0.5</td>
<td>Reduced, Ordered Binary Decision Diagrams</td>
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</tr>
<tr>
<td>0.5</td>
<td>Hazards</td>
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</table>

**Midterm Exam 1**, Thurs. March 5, in class

<table>
<thead>
<tr>
<th>Weeks</th>
<th>General Topic</th>
<th>Specific Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Combinational Circuit Design</td>
<td>Adders</td>
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<tr>
<td></td>
<td></td>
<td>Subtractors</td>
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<tr>
<td></td>
<td></td>
<td>Multiplexers</td>
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<td></td>
<td></td>
<td>Encoders/Decoder</td>
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<tr>
<td></td>
<td></td>
<td>Comparators</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Arithmetic Operations</td>
</tr>
<tr>
<td>2</td>
<td>Introduction to Sequential Circuits</td>
<td>Latches &amp; Flip-flops</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S-R and D Latches</td>
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<tr>
<td></td>
<td></td>
<td>S-R, J-K, D, and T Flip-Flops</td>
</tr>
</tbody>
</table>

**Midterm Exam 2**, Thurs. April 15, in class

<table>
<thead>
<tr>
<th>Weeks</th>
<th>General Topic</th>
<th>Specific Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Sequential Circuit Design</td>
<td>State Graphs and Tables</td>
</tr>
<tr>
<td></td>
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<td>Shifters</td>
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<td>Counters</td>
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<td>Registers</td>
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<td>State Assignments</td>
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<td></td>
<td></td>
<td>State Reduction</td>
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<tr>
<td>2</td>
<td>Timing Analysis</td>
<td></td>
</tr>
</tbody>
</table>

**Final Exam**, Tue. May 12
Midterm Exam 1 Topics

Short Answer

Material covered on Homeworks 1 – 3. (You’ll be given a photocopy of page 186 of the textbook.)

Longer Answer

You are responsible for the following material:

- Chapter 1: all except for 1’s complement and Section 1.5.
- Chapter 2: all.
- Chapter 3: Sections 3.1, 3.2, and 3.3.
- Chapter 4: all except Section 4.1.
- Chapter 5: Sections 5.1, 5.2, and 5.3.
- Chapter 6: Sections 6.1 and 6.2.
- Chapter 7: Section 7.1, 7.2, and 7.3.

Material not in the textbook:

- Binary decision diagrams.
- The canonical AND-XOR form (also goes by the name “XNF” and the Reed-Muller form).
- Logic-level timing analysis.

Midterm Exam 2 Topics

Short Answer

Material covered on Homeworks 4, 5, and 6. Know how the R-S latch works.

Longer Answer

You are responsible for the following material:

- Chapter 9: Sections 9.1, 9.2, and 9.4
- Chapter 11: all (except for the part on “Switch Debouncing” in Section 11.2)
- Chapter 12: all (except for Counter Design using S-R Flip-Flops)
- Chapter 13: Sections 13.3 and 13.4. (Section 13.4 is important – know this material.)
- Chapter 14: Sections 14.1, 14.2, and 14.3

Final Exam Topics

You are responsible for the following material:

- Chapter 15: Sections 15.1, 15.2, 15.3, and 15.4
- Chapter 16: Sections 16.1 and 16.3
- Chapter 18: Section 18.2
- Chapter 19: 19.1, 19.2, and 19.3 (in a cursory way)
In principle, the exam is cumulative. However, you will not see the following topics:

- Number systems and base conversions.
- Converting between two-level forms (but know K-maps).
- Binary Decision Diagrams.
- AND-XOR two-level forms.
- XOR trees.
- Sorting and counting networks.
- Permutation networks.
- Stochastic logic.

You will definitely see the following topics:

- Logic-level symbolic timing analysis.
- Existential and universal quantification (but not Boolean derivatives and integrals).
- Circuits that perform arithmetic on data paths: addition, subtraction, multiplication.
- Analyzing simple switching circuits.
- Analyzing and building circuits with D flip-flops, T flip-flops, and J-K flip-flops (but not how these flip-flops are built).
- Iterative circuits with counters and register (up/down counters; parallel load / serial shift registers).
- Iterative multiplication.
- Going from a specification to a state graph. (Know the difference between Moore and Mealy machines.)
- Reducing a state graph.
- Assigning states and writing a state transition table.
- Synthesizing a complete synchronous sequential circuit.
B.2.10 Syllabus: EE 5393, Circuits, Computation, Biology

Time: Wed. and Fri., 2:30pm – 3:45pm, Spring 2011 (Offered through UNITE.)

Description
This course explores connections between engineering concepts – circuit theory, digital computation, and distributed computing in particular – and biological systems. A broad theme is the application of expertise from the former to the latter – specifically, the application of algorithmic and computational expertise from circuit design to the analysis and synthesis of biochemical and neural systems. This course is aimed at a wide audience: graduate students and upper-level undergraduates from engineering, computer science, mathematics, biology, and the life sciences. No prior knowledge of engineering or biology is assumed; only basic college-level mathematics is required. While the course investigates a variety of topics from disparate fields, it does not attempt to survey the research exhaustively. Rather, it strives for depth and mathematical rigor in select areas. Topics that are covered include:

- Feedback in digital circuits, in neural systems, and in biochemical reactions.
- The analysis and synthesis of probabilistic logic.
- The analysis and synthesis of probabilistic biochemistry.
- Data structures and discrete-event simulation techniques for circuits and for biology.
- Spectral methods and measures of complexity.
- Linear threshold logic and neural computation.

Instructor

Prof. Marc Riedel
email: mriedel@umn.edu
office: Keller Hall 4-167
tel: 612-625-6086

Lecture
- Wed. and Friday, 2:30pm – 3:45pm, Mech. Eng., Room 212

Office Hours
- Mon. 3 – 5pm (or by appointment)

Text & Manuals
- No textbook is required.
- Research papers (in the form of PDFs) will be posted for most of the research topics that are covered.
Grading

- Homework: 70%
- Quizzes: 30%

(Complete the quizzes during the first 10 minutes of class. Or do them outside of class. Redo them if you get any questions wrong. Ask me to explain the answers and then resubmit them. Basically, you can’t not get this 30% unless you don’t try.)

Letter grades will be assigned according to the following (absolute) scale:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A</td>
<td>≥ 90%</td>
</tr>
<tr>
<td>A-</td>
<td>≥ 85%</td>
</tr>
<tr>
<td>B+</td>
<td>≥ 80%</td>
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<tr>
<td>B</td>
<td>≥ 75%</td>
</tr>
<tr>
<td>B-</td>
<td>≥ 65%</td>
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<tr>
<td>C+</td>
<td>≥ 60%</td>
</tr>
<tr>
<td>C</td>
<td>≥ 55%</td>
</tr>
<tr>
<td>C-</td>
<td>≥ 50%</td>
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<tr>
<td>D</td>
<td>≥ 40%</td>
</tr>
<tr>
<td>F</td>
<td>&lt; 40%</td>
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Even though the grading is quantitative and objective, we must state the university grading standards. According to University policy, grades are assigned with the following meaning:

- A – Achievement that is outstanding relative to the level necessary to meet course requirements.
- B – Achievement that is significantly above the level necessary to meet course requirements.
- C – Achievement that meets the course requirements in every respect.
- D – Achievement that is worthy of credit even though it fails to meet fully the course requirements.
- S – Achievement that is satisfactory (equivalent to a C or better).
- F (or N) – Represents failure (or no credit) and signifies that the work was either completed, but at a level of achievement that is not worthy of credit, or was not completed and there was no agreement between the instructor and the student that the student would be awarded an incomplete.
- I (Incomplete) – Assigned at the discretion of the instructor when, due to extraordinary circumstances, a student is prevented from completing the work of the course on time. Assignment of an “I” grade requires a written agreement between the instructor and the student. “Extraordinary circumstances” are such things as hospitalization, serious car accidents, and major illnesses. They do not include excuses such as “working too much,” “took too many credits,” and so forth. Furthermore, an “I” can be assigned only when a small portion of the course remains to be completed.
### Course Topics

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td><strong>Introduction</strong></td>
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</tr>
<tr>
<td>Jan. 19, 2011</td>
<td>Introduction to synthetic biology (bacterial motors, etc.);</td>
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<tr>
<td></td>
<td>artificial life; an engineer’s view of biochemistry;</td>
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<tr>
<td></td>
<td>circuits, computation, and our brains.</td>
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<tr>
<td><strong>Computation</strong></td>
<td></td>
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<tr>
<td>Jan. 21, 2011</td>
<td>The “chimpanzee” model of computation;</td>
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<tr>
<td></td>
<td>an introduction to logical computation on stochastic bit streams.</td>
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<tr>
<td>Jan. 26, 2011</td>
<td>Data structures for digital circuit design and verification</td>
</tr>
<tr>
<td></td>
<td>in general, and binary decision diagrams in particular.</td>
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<tr>
<td>Jan. 28, 2011</td>
<td>Cyclic binary decision diagrams; “narrow” binary decision diagrams;</td>
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<td></td>
<td>cyclic permutations.</td>
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<tr>
<td>Feb. 4, 2011</td>
<td>Translating circuits into conditional permutations.</td>
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<tr>
<td>Feb. 9, 2011</td>
<td>Symmetric functions, including the majority function;</td>
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<td></td>
<td>comparators and sorting networks; balancers and balancing networks.</td>
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<tr>
<td>Feb. 11, 2011</td>
<td>Synchronous sorting networks; the zero-one principle; sorting</td>
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<td></td>
<td>arbitrary values.</td>
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<tr>
<td><strong>Biology</strong></td>
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<tr>
<td>Feb. 25, 2011</td>
<td>Stochastic simulation (Monte Carlo methods); cycle leaping.</td>
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<tr>
<td>Mar. 2, 2011</td>
<td>Probabilistic lattices; event leaping.</td>
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<tr>
<td>Mar. 9, 2011</td>
<td>Computing arithmetic functions with biochemistry.</td>
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<tr>
<td>Mar. 11, 2011</td>
<td>Modules for molecular computation.</td>
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<tr>
<td>Mar. 23, 2011</td>
<td>Synthesizing stochasticity with chemical reactions.</td>
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<tr>
<td>Mar. 25, 2011</td>
<td>Digital signal processing with chemical reactions.</td>
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<tr>
<td>April 1, 2011</td>
<td>Binary counting with chemical reactions;</td>
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<td></td>
<td>rate-independent constructs for chemical computation.</td>
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<tr>
<td><strong>Circuits</strong></td>
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<tr>
<td>April 8, 2011</td>
<td>Computing with Feedback: synthesis.</td>
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<tr>
<td>April 15, 2011</td>
<td>Synthesizing Logical Computation on Stochastic Bit Streams.</td>
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<tr>
<td>April 20, 2011</td>
<td>Circuit complexity and lower bounds.</td>
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<tr>
<td>April 22, 2011</td>
<td>Modeling circuits with ternary valued logic.</td>
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<tr>
<td>April 27, 2011</td>
<td>Symbolic timing analysis.</td>
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<tr>
<td>April 29, 2011</td>
<td>Analyzing and synthesizing functional dependencies.</td>
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<tr>
<td>May 5, 2011</td>
<td>Switching circuits; lattice-based computation; percolation.</td>
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<tr>
<td>May 6, 2011</td>
<td>Parity trees; upper and lower bounds on the circuit size for exclusive-OR.</td>
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