Dear Professor Kartik Mohanram:

Student Opinion of Teaching Questionnaire Results

This form contains evaluation results for DIGITAL LOGIC(COE-0132)-1020.

Attached is a report in PDF format containing your Student Opinion of Teaching Survey results from last term. The report is best viewed and/or printed in color.

The evaluation results are broken down into three distinct categories. The first part of the report shows a breakdown of student responses to the quantitative questions. For each item, the number of students (n) who responded, the average or mean (av.) and standard deviation (dev.) are displayed next to a chart or histogram that shows the percentage of the class who responded to each option for that question. The percentages are above the number on the rating scale which increases from left to right, i.e. the number 1 equals the least favorable rating and the number 4 or 5 (depending on the scale) equals the most favorable rating. The sum of percentages will equal 100%. A red mark is displayed on the chart where the average or mean is located. To calculate how many students responded to each option, multiply the number of students who answered the question by the percentage for that option. For example, if 14 students answered the question and 50% responded to option 3 then 7 students marked option 3 for that item (14 x .50 = 7). The standard deviation is a common measure of dispersion around the mean that may be useful in interpreting the results.

If your school had previously calculated norms, they will be on OMET’s website (omet.pitt.edu).

The second part displays individual comments to each question in the open-ended section of the evaluation. All the responses to the first question will be listed together after the first question and then the responses to the next question will be listed together after the next question, and so on.

The final part gives you a profile of the student responses to the quantitative section of the evaluation. This is a chart listing all of the means for the scaled items with a dashed red line connecting the means.

If the number of respondents for any of the scaled items is fewer than seven, please be cautious in interpreting the quantitative results.

Office of Measurement and Evaluation of Teaching (OMET)
1. SELF RATINGS

1.1) Compared to other courses at the same level, the amount of work I did was:

- Much less
- Much more

<table>
<thead>
<tr>
<th>Amount</th>
<th>Number of Respondents</th>
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<tbody>
<tr>
<td>1</td>
<td>0%</td>
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<tr>
<td>2</td>
<td>3.8%</td>
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<td>3</td>
<td>19.2%</td>
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<td>4</td>
<td>38.5%</td>
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<td>5</td>
<td>38.5%</td>
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</tbody>
</table>

n=26  
av.=3.73  
dev.=0.83

1.2) In this course I have learned:

- Much less
- Much more

<table>
<thead>
<tr>
<th>Amount</th>
<th>Number of Respondents</th>
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<tbody>
<tr>
<td>1</td>
<td>0%</td>
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<tr>
<td>2</td>
<td>19.2%</td>
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<td>4</td>
<td>38.5%</td>
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<td>5</td>
<td>3.8%</td>
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</tbody>
</table>

n=26  
av.=4.08  
dev.=0.98

1.3) The grade I expect in this course is:

- A
- B
- C
- D
- F
- Other

<table>
<thead>
<tr>
<th>Grade</th>
<th>Number of Respondents</th>
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<tbody>
<tr>
<td>A</td>
<td>28%</td>
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<tr>
<td>B</td>
<td>40%</td>
</tr>
<tr>
<td>C</td>
<td>32%</td>
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<tr>
<td>D</td>
<td>0%</td>
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<tr>
<td>F</td>
<td>0%</td>
</tr>
<tr>
<td>Other</td>
<td>0%</td>
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</tbody>
</table>

n=25

2. TEACHING EVALUATION

2.1) The instructor presented the course in an organized manner.

- Hardly at all
- To a very high degree

<table>
<thead>
<tr>
<th>Rating</th>
<th>Number of Respondents</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>0%</td>
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<tr>
<td>2</td>
<td>7.7%</td>
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<td>3</td>
<td>23.1%</td>
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<tr>
<td>4</td>
<td>11.5%</td>
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<tr>
<td>5</td>
<td>57.7%</td>
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</table>

n=26  
av.=4.19  
dev.=1.06

2.2) The instructor stimulated my thinking.

- Hardly at all
- To a very high degree

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<thead>
<tr>
<th>Rating</th>
<th>Number of Respondents</th>
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<tbody>
<tr>
<td>1</td>
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<tr>
<td>2</td>
<td>0%</td>
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<tr>
<td>3</td>
<td>15.4%</td>
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<tr>
<td>4</td>
<td>80.8%</td>
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</tbody>
</table>

n=26  
av.=4.69  
dev.=0.84

2.3) The instructor evaluated my work fairly.

- Hardly at all
- To a very high degree

<table>
<thead>
<tr>
<th>Rating</th>
<th>Number of Respondents</th>
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<tbody>
<tr>
<td>1</td>
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<tr>
<td>2</td>
<td>0%</td>
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<tr>
<td>3</td>
<td>26.9%</td>
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<tr>
<td>4</td>
<td>57.7%</td>
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</table>

n=26  
av.=4.38  
dev.=0.85

2.4) The instructor made good use of examples to clarify concepts.

- Hardly at all
- To a very high degree

<table>
<thead>
<tr>
<th>Rating</th>
<th>Number of Respondents</th>
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<tbody>
<tr>
<td>1</td>
<td>7.7%</td>
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<td>2</td>
<td>3.8%</td>
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<td>3</td>
<td>23.1%</td>
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<td>4</td>
<td>15.4%</td>
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<tr>
<td>5</td>
<td>50%</td>
</tr>
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n=26  
av.=3.96  
dev.=1.28

2.5) The instructor maintained a good learning environment.

- Hardly at all
- To a very high degree

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<tr>
<th>Rating</th>
<th>Number of Respondents</th>
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<tbody>
<tr>
<td>1</td>
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<tr>
<td>2</td>
<td>0%</td>
</tr>
<tr>
<td>3</td>
<td>19.2%</td>
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<tr>
<td>4</td>
<td>78.9%</td>
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</tbody>
</table>

n=26  
av.=4.85  
dev.=0.85

2.6) The instructor was accessible to students. (Do not answer if no basis to judge)

- Hardly at all
- To a very high degree

<table>
<thead>
<tr>
<th>Rating</th>
<th>Number of Respondents</th>
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<tbody>
<tr>
<td>1</td>
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<td>2</td>
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<tr>
<td>3</td>
<td>13.6%</td>
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<tr>
<td>4</td>
<td>81.8%</td>
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n=22  
av.=4.88  
dev.=0.89
2.7) Express your judgment of the instructor's overall teaching effectiveness:

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<tbody>
<tr>
<td>Effective</td>
<td>4%</td>
<td>4%</td>
<td>4%</td>
<td>4%</td>
<td>48%</td>
</tr>
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</table>

n=25  
av=4.24  
dev=1.01

2.8) Would you recommend this course to other students?

- Probably not  3.8%  
- Probably yes  46.2%  
- Definitely yes  50%

n=26

2.9) Would you recommend this instructor to other students?

- Definitely not  3.8%  
- Probably not  3.8%  
- Probably yes  26.9%  
- Definitely yes  65.4%

n=26

3. SWANSON SCHOOL OF ENGINEERING ADDITIONAL ITEMS- select only one answer for each item

3.1) ability to use math concepts to solve engineering problems.

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<tr>
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<tbody>
<tr>
<td>Not at all</td>
<td>7.7%</td>
<td>7.7%</td>
<td>34.6%</td>
<td>26.9%</td>
<td>23.1%</td>
</tr>
<tr>
<td>A great deal</td>
<td>3.8%</td>
<td>3.8%</td>
<td>3.8%</td>
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<td>3.8%</td>
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</table>

n=26  
av=3.5  
dev=1.17

3.2) ability to use chemistry concepts to solve engineering problems.

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<tbody>
<tr>
<td>Not at all</td>
<td>69.2%</td>
<td>19.2%</td>
<td>3.8%</td>
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<td>3.8%</td>
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<tr>
<td>A great deal</td>
<td>3.8%</td>
<td>3.8%</td>
<td>3.8%</td>
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n=26  
av=1.54  
dev=1.03

3.3) ability to use physics concepts to help solve engineering problems.

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<tbody>
<tr>
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<td>38.5%</td>
<td>19.2%</td>
<td>30.8%</td>
<td>7.7%</td>
<td>3.8%</td>
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<tr>
<td>A great deal</td>
<td>3.8%</td>
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n=26  
av=2.19  
dev=1.17

3.4) ability to use engineering concepts to help solve problems.

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<tbody>
<tr>
<td>Not at all</td>
<td>3.8%</td>
<td>3.8%</td>
<td>15.4%</td>
<td>42.3%</td>
<td>34.6%</td>
</tr>
<tr>
<td>A great deal</td>
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n=26  
av=4.02  
dev=1.02

3.5) ability to design an experiment to obtain measurements or gain additional knowledge about a process.

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<tr>
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<td>42.3%</td>
<td>7.7%</td>
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<td>15.4%</td>
<td>19.2%</td>
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<tr>
<td>A great deal</td>
<td>3.8%</td>
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n=26  
av=2.12  
dev=1.63

3.6) ability to analyze and interpret engineering data.

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<tbody>
<tr>
<td>Not at all</td>
<td>15.4%</td>
<td>7.7%</td>
<td>19.2%</td>
<td>38.5%</td>
<td>19.2%</td>
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<tr>
<td>A great deal</td>
<td>3.8%</td>
<td>3.8%</td>
<td>3.8%</td>
<td>3.8%</td>
<td>3.8%</td>
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</tbody>
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n=26  
av=3.38  
dev=1.33

3.7) ability to design a device or process to meet a stated need.

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<tbody>
<tr>
<td>Not at all</td>
<td>0%</td>
<td>3.8%</td>
<td>23.1%</td>
<td>30.8%</td>
<td>42.3%</td>
</tr>
<tr>
<td>A great deal</td>
<td>3.8%</td>
<td>3.8%</td>
<td>3.8%</td>
<td>3.8%</td>
<td>3.8%</td>
</tr>
</tbody>
</table>

n=26  
av=4.12  
dev=0.91
3.8) ability to function effectively in different team roles.

Not at all | A great deal
--- | ---
1 | n=26
2 | av.=2.12
3 | dev.=1.48
4 |
5 |

3.9) ability to formulate and solve engineering problems.

Not at all | A great deal
--- | ---
0% | n=26
7.7% | av.=4.94
15.4% | dev.=0.92
42.3% |
34.6% |

3.10) ability to use laboratory procedures and equipment.

Not at all | A great deal
--- | ---
88% | n=25
4% | av.=1.28
0% | dev.=0.84
8% |
0% |

3.11) ability to use software packages to solve engineering problems.

Not at all | A great deal
--- | ---
44% | n=25
36% | av.=1.88
12% | dev.=1.05
4% |
4% |

3.12) ability to use CAD software.

Not at all | A great deal
--- | ---
83.3% | n=24
16.7% | av.=1.17
0% | dev.=0.38
0% |
0% |

3.13) knowledge of professional and ethical responsibility.

Not at all | A great deal
--- | ---
38.5% | n=26
26.9% | av.=2.31
11.5% | dev.=1.41
11.5% |
11.5% |

3.14) ability to write reports effectively.

Not at all | A great deal
--- | ---
88% | n=25
8% | av.=1.16
4% | dev.=0.47
0% |
0% |

3.15) ability to make effective oral presentations.

Not at all | A great deal
--- | ---
92% | n=25
4% | av.=1.16
0% | dev.=0.62
4% |
0% |

3.16) knowledge about the potential risks (to the public) and impacts that an engineering solution or design may have.

Not at all | A great deal
--- | ---
12% | n=25
20% | av.=3.2
24% | dev.=1.32
24% |
20% |

3.17) ability to apply knowledge about current issues (economic/environmental/political/societal/etc.) to engineering-related problems.

Not at all | A great deal
--- | ---
19.2% | n=26
7.7% | av.=3.27
23.1% | dev.=1.43
23.1% |
19.2% |

3.18) appreciation of the need to engage in life-long learning.

Not at all | A great deal
--- | ---
3.8% | n=26
3.8% | av.=4.19
19.2% | dev.=1.13
15.4% |
57.7% |

4. TEACHING COMMENTS

4.1) What were the instructor's major strengths?

- Connecting what we were learning to practical industry skills and contextualizing the skills we were learning.
- Dr. Mohanram has an extensive knowledge of the subject matter and the field in general. He can answer any and all of your questions. He also presents ideas and concepts clearly, even when they are complex.
Dr. Mohanram is a great professor! He is interesting, accessible, and a really great teacher. He does a great job explaining concepts and also does a great job using examples to clarify the concepts that he explains.

Dr. Mohanram knows the material extremely well and really enjoys teaching the course. He grades the exams very fairly and tries to be as available as possible for the students.

The material is very hard and for most of us this is the first time seeing anything like it. He tries to introduce us to the concepts and then provide application for what we are learning which can be very interesting.

Easy going, relaxed atmosphere. Accessible via email, always got a response from TA, professor, or both. Much appreciate.

Effectively taught the material in an easy way to understand. Really helped realize how this material applies to what we would be working with for the rest of our career/education paths.

Explaining real life applications to Digital Logic.
Fun lectures.
Ease of asking questions.

Great notes, lectures, and explanations/examples. He is very approachable and very willing to help.

Having interesting lectures

He explained his experience in the work force and how that translates to the material we are learning.

He is very knowledgeable about this material. He is always open to answer questions.

He knows a lot about the subject
Very good at stimulating thinking past the subject of digital logic

He obviously loves the subject he teaches and knows EVERYTHING about it. He teaches very well and makes very good use of examples in a course that would make very little sense without them.

He was very organized, enthusiastic and approachable.

His knowledge of material is evident. He is very excited about the material also.

How he tied everything in to real world applications. Teacher has so much knowledge in everything that has to do with computers.

Knowledge

Professor Mohanram is very knowledgeable in his field, and he always gave good real life examples of applications of everything we learned in class, making lectures a lot more interesting.

Professor Mohanram knows the material well and knows how to present it in a logical and straight forward manner. He is always willing to answer questions in class and knows a great deal about the industry and research components.

The professor has a very strong grasp of the current and past history of computing and talks about his thoughts about future technology to an accurate degree. Specifically his talk about the Internet of Things helped tremendously to help my understanding of the concept. I used this knowledge to wind the best overall app at the 2014 Att and IBM a hackathon at Pitt.

In addition he is approachable and was very good in office hours and communicating via email. He choose a good TA that was instrumental to my successes in the course.

Very enthusiastic

Very knowledgeable and willing to help

Very reasonable and respectful with students. Makes class fun and enjoyable. Has immense knowledge on not just the subject matter but also the industry.

What were the instructor's major weaknesses?

Because Dr. Mohanram knows the material so well I feel he sometimes forgets that this is the first time many of us have ever seen anything like it. Sometimes he skips over important details or simple explanations that he assumes we know and understand. Sometimes I felt like I would come to class and have accidentally skipped an entire lecture. Although I appreciated the later applications to what we are learning (such as talking about manufactures and their process in developing computer components) I would much rather have more examples of problems we might see on homework, exams or quizzes. Particularly whenever we get to decoders, multiplexors, and encoders for these devices seemed the most confusing at first. Also the first week of class was largely vague and not very helpful. I would have liked a better introduction the Boolean logic that first week instead of talking about Intel and Arm.
Overall I felt Dr. Mohanram is an excellent professor who really wants his students to do well, he just needs to give us a bit more material to work with and problems in class that he walks us through.

- Do not really go over problems like the assigned homework. This makes them hard to answer since I do not really know how to answer the given questions. Also the same goes for the quizzes.
- Dr. Mohanram moves quickly through course material. I also wish I could receive updates on my progress in the course.
- He cannot simplify material down to an understandable level. He was not easily available to reach for help. He scheduled office hours during another required course in the ECE department. It was very unfair to students in those classes.
- He would sometimes begin talking about a foreign topic like it was already familiar material
- High difficulty for exams
- His personal lecture notes did not include practice problems that would have helped familiarize me with questions that would be on quizzes exams and homework
- I do not believe the in class examples helped very much at all with the homework assigned. If one is completely lost on a topic he doesn't do too good of a job helping through that.
- I wish he used more examples right after he explains the concepts rather than at the very end of the class.
- Lack of organization. I don't need the standard "read this, do these problems" in every class but if I missed a lecture I was completely lost as to what would have been taught.
  
  I think I opened this very expensive textbook twice for this class.

- N/A
- No complaints!
- No major weaknesses
- None in particular
- None.
- Sometimes difficult to formulate notes with his style of writing notes ahead of time; difficult to leave enough space for things added in as lecture goes on
- none

### 5. COURSE COMMENTS

5.1) What aspects of this course were most beneficial to you?

- All of them.
- All the material was applicable to things we would be involved in as EE and CoE students. Prepared us well for next semester's classes and lab.
- Gave me a solid starting understanding of how computers worked.
- Good building blocks
- Helped develop my understanding of fundamental digital concepts that I'm sure to use later on at school and in the work place.
- Homework clarified the concepts and techniques that were taught in class.
- I learned many completely new and interesting topics
- I really enjoyed the design aspect of this course.
- I think the entire course was really helpful and I will likely use all of it.
- I work with automation software so it was nice to be given a method to reduce everything to gates and transistors and to be able to formulate solutions to stated problems with less trial, compile and error.
- Learning how gates and logic work in a real world device.
Learning the logic behind devices

Not sure

The book that he does not use was very easy to understand. I wish he would of used it in the class as a supplement.

The concepts of the course with combinational and sequential logic were and will be the most beneficial to me in the future as a computer engineer.

The connection of what we were doing to real life, and the construction up approach we took, starting at transistors and working upwards showed how the concepts really built on themselves.

The use of transistors and k-maps

This course gave me extensive knowledge of digital design and analysis. It showed me that computer engineering is right major for me, even though it was challenging.

This course really hits on fundamentals of engineering, in designing circuits that have to perform certain functions, and having to build the most efficient circuit possible. So, this course really stimulates critical thinking about designing something with certain specifications efficiently.

We covered so much in so little

What suggestions do you have to improve the course?

Assign a better textbook. The one we had now is almost worthless for this course because the concepts it talks about are extremely involved and has poorly written examples.

Course is set up well, cannot think of any improvements

Do NOT write your own homework. The questions written were very open ended and confusing when read. I wasn't sure what you wanted. Also on exams, you didn't explain questions very well which lead to misunderstandings.

Go over some questions in class prior to the quizzes and assigned homework

I do not have any recommendations for the course.

I found the online notes to not be very helpful. Practice tests or problems would be extremely helpful.

I think that more time should have been spent learning Verilog/VHDL

I thought there was a disconnect between recitation and lecture resulting in quite a few quizzes on brand new material. I also thought the course could have been better organized.

I would love a breadboarding or software design component, but I believe that may occur in a later course.

Less ambiguous instructions in the homework assignments

Make the homework more relevant to in class examples.

N/A (2 Counts)

None.

Not sure

Nothing!

Offering students more frequent updates on their grades would be beneficial.

incorporate even more real world applications
Profile

Subunit: ENGINEERING-ELECTRICAL & COMPUTER
Name of the instructor: Professor Kartik Mohanram,
Name of the course: DIGITAL LOGIC(COE-0132)-1020

Values used in the profile line: Mean

1. SELF RATINGS

1.1) Compared to other courses at the same level, the amount of work I did was:
   - Much less
   - Much more
   n=26  av.=3.73  md=4.00  dev.=0.83

1.2) In this course I have learned:
   - Much less
   - Much more
   n=26  av.=4.08  md=4.00  dev.=0.98

2. TEACHING EVALUATION

2.1) The instructor presented the course in an organized manner.
   - Hardly at all
   - To a very high degree
   n=26  av.=4.19  md=5.00  dev.=1.06

2.2) The instructor stimulated my thinking.
   - Hardly at all
   - To a very high degree
   n=26  av.=4.69  md=5.00  dev.=0.84

2.3) The instructor evaluated my work fairly.
   - Hardly at all
   - To a very high degree
   n=26  av.=4.38  md=5.00  dev.=0.85

2.4) The instructor made good use of examples to clarify concepts.
   - Hardly at all
   - To a very high degree
   n=26  av.=3.96  md=4.50  dev.=1.28

2.5) The instructor maintained a good learning environment.
   - Hardly at all
   - To a very high degree
   n=26  av.=4.65  md=5.00  dev.=0.85

2.6) The instructor was accessible to students. (Do not answer if no basis to judge)
   - Hardly at all
   - To a very high degree
   n=22  av.=4.68  md=5.00  dev.=0.89

2.7) Express your judgment of the instructor's overall teaching effectiveness:
   - Ineffective
   - Excellent
   n=25  av.=4.24  md=4.00  dev.=1.01

3. SWANSON SCHOOL OF ENGINEERING ADDITIONAL ITEMS- select only one answer for each item

3.1) ability to use math concepts to solve engineering problems.
   - Not at all
   - A great deal
   n=26  av.=3.50  md=3.50  dev.=1.17

3.2) ability to use chemistry concepts to solve engineering problems.
   - Not at all
   - A great deal
   n=26  av.=1.54  md=1.00  dev.=1.03

3.3) ability to use physics concepts to help solve engineering problems.
   - Not at all
   - A great deal
   n=26  av.=2.19  md=2.00  dev.=1.17

3.4) ability to use engineering concepts to help solve problems.
   - Not at all
   - A great deal
   n=26  av.=4.00  md=4.00  dev.=1.02

3.5) ability to design an experiment to obtain measurements or gain additional knowledge about a process.
   - Not at all
   - A great deal
   n=26  av.=2.62  md=2.50  dev.=1.63

3.6) ability to analyze and interpret engineering data.
   - Not at all
   - A great deal
   n=26  av.=3.38  md=4.00  dev.=1.33

3.7) ability to design a device or process to meet a stated need.
   - Not at all
   - A great deal
   n=26  av.=4.12  md=4.00  dev.=0.91

3.8) ability to function effectively in different team roles.
   - Not at all
   - A great deal
   n=26  av.=2.12  md=1.50  dev.=1.48
3.9) ability to formulate and solve engineering problems.

Not at all | A great deal
---|---

3.10) ability to use laboratory procedures and equipment.

Not at all | A great deal

3.11) ability to use software packages to solve engineering problems.

Not at all | A great deal

3.12) ability to use CAD software.

Not at all | A great deal

3.13) knowledge of professional and ethical responsibility.

Not at all | A great deal

3.14) ability to write reports effectively.

Not at all | A great deal

3.15) ability to make effective oral presentations.

Not at all | A great deal

3.16) knowledge about the potential risks (to the public) and impacts that an engineering solution or design may have.

Not at all | A great deal

3.17) ability to apply knowledge about current issues (economic/environmental/political/societal/etc.) to engineering-related problems.

Not at all | A great deal

3.18) appreciation of the need to engage in life-long learning.

Not at all | A great deal

| n=26 | av.=4.04 md=4.00 dev=0.92 |
| n=25 | av.=1.28 md=1.00 dev=0.84 |
| n=25 | av.=1.88 md=2.00 dev=1.05 |
| n=24 | av.=1.17 md=1.00 dev=0.38 |
| n=26 | av.=2.31 md=2.00 dev=1.41 |
| n=25 | av.=1.16 md=1.00 dev=0.47 |
| n=25 | av.=1.16 md=1.00 dev=0.62 |
| n=25 | av.=3.20 md=3.00 dev=1.32 |
| n=26 | av.=3.27 md=3.50 dev=1.43 |
| n=26 | av.=4.19 md=5.00 dev=1.13 |