# Evaluation of Instruction Program Report

## 1. Background Information:

### 1.1) Year in School:

<table>
<thead>
<tr>
<th>Year</th>
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<tbody>
<tr>
<td>Freshman</td>
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<tr>
<td>Sophomore</td>
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<tr>
<td>Junior</td>
<td>16</td>
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<tr>
<td>Senior</td>
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<tr>
<td>Graduate</td>
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<tr>
<td>Other</td>
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### 1.2) UCLA GPA:

<table>
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<tr>
<td>2.0 - 2.49</td>
<td>0</td>
</tr>
<tr>
<td>2.5 - 2.99</td>
<td>1</td>
</tr>
<tr>
<td>3.0 - 3.49</td>
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### 1.3) Expected Grade:

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<tr>
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<td>D</td>
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<tr>
<td>P</td>
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</tr>
<tr>
<td>NP</td>
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<tr>
<td>?</td>
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### 1.4) What requirements does this course fulfill?

<table>
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<tr>
<td>Major</td>
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<td>Related Field</td>
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<td>G.E.</td>
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<tr>
<td>None</td>
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</tbody>
</table>
2. To What Extent Do You Feel That:

2.1) Instructor Concern – The instructor was concerned about student learning.

2.2) Organization – Class presentations were well prepared and organized.

2.3) Interaction – Students felt welcome in seeking help in or outside of the class.

2.4) Communication Skills – The instructor had good communication skills.

2.5) Value – You have learned something you consider valuable.

2.6) Overall – Your overall rating of the instructor.

2.7) Overall – Your overall rating of the course.

3. Your View of Course Characteristics:

3.1) Subject interest before course

3.2) Subject interest after course
3.3) Mastery of course material

- Low: 0
- 3
- 18
- High

n=21
av.=2.86
md=3
dev=0.36

3.4) Difficulty (relative to other courses)

- Low: 13
- 7
- 1
- High

n=21
av.=1.43
md=1
dev=0.6

3.5) Workload/pace was

- Too Slow: 4
- 17
- 0
- Too Much

n=21
av.=1.81
md=2
dev=0.4

3.6) Texts, required readings

- Poor: 0
- 9
- 5
- Excellent

n=14
av.=2.36
md=2
dev=0.5
ab.=7

3.7) Homework assignments

- Poor: 0
- 8
- 8
- Excellent

n=16
av.=2.5
md=2.5
dev=0.52
ab.=5

3.8) Graded materials, examinations

- Poor: 0
- 9
- 12
- Excellent

n=21
av.=2.57
md=3
dev=0.51

3.9) Lecture presentations

- Poor: 0
- 6
- 15
- Excellent

n=21
av.=2.71
md=3
dev=0.46

3.10) Class discussions

- Poor: 0
- 7
- 12
- Excellent

n=19
av.=2.63
md=3
dev=0.5
ab.=2

4. ABET Course Outcomes (please note that these questions are required to be answered)

4.1) (a) Learn how to work effectively and safely in a laboratory setting

- Poor: 1
- 0
- 2
- 8
- 10
- Excellent

n=21
av.=4.24
md=4
dev=1

4.2) (b) Gain a diverse skill set of skills useful for bioengineering practice

- Poor: 3
- 0
- 2
- 4
- 12
- Excellent

n=21
av.=4.05
md=5
dev=1.43

4.3) (c) Document experimental progress in a laboratory notebook, analyze and prepare scientific papers/reports

- Poor: 1
- 4
- 2
- 7
- 7
- Excellent

n=21
av.=3.71
md=4
dev=1.27
5. Comments:

5.1) Please identify what you perceive to be the real strengths and weaknesses of this instructor and course.

- Dr. Chen did a really great job making it clear to students how much he cared about our learning during class as well as making himself available at any time outside of class. The lectures were always well prepared and presented in a very engaging manner. Lab reports and midterm exams were also very fair. Dr Chen also did a great job accommodating the needs of students, whether it be granting extensions when needed or missing lecture/lab. I overall really enjoyed the material of this course.

- Dr. Chen is one of the friendliest and most welcoming professors I have had. I enjoyed learning about cutting edge technologies and applying them during lab section. However, it was sometimes hard to justify going to class at 8am when most of the material could be found on the posted slides anyways.

- Dr. Chen was clearly very concerned with student learning and well-being. It is clear that he put in a lot of effort to make well designed slides each week. In terms of content, I would have liked to learn a little bit more about the physics and math behind how TENGs and MEGs work. In the future it might be nice to include more equations governing the behavior of these devices in lecture.

I was a little nervous about taking a course that had never been offered before, but it was a very positive experience. I would say that in the future, it would be ideal if the course could be offered a little later, perhaps at 9am or 10am. I also think that only one lab session per week was necessary. We would come to lab both times each week, but we were almost always finished within 90 minutes. I would also recommend combining the Lab Tour from Week 1 and the Week 2 Lab activity into one lab. This would allow students two weeks to work on their final project before presenting in Week 10, instead of just one.

Dr. Chen's flexibility on deadlines, particularly extending the deadline on the MEG lab report, was much appreciated, as it allowed us to enjoy more of the break. It was somewhat unfortunate that Week 10 came right after the Thanksgiving break because we had to work on our final project presentation during it. If the break falls similarly on the calendar in the future, perhaps students could give their final project presentation during finals week instead.

- For lecture, I feel that a 1 hour time slot would suffice. I think that 2 hours felt a bit long and unnecessary for the material that was discussed. Also, I would have liked a more in-depth explanation of the working principles of the TENG and MEG, i.e. electrostatics equations, Faraday's Law, and other numerical calculations. Discussing formulae would help students build a stronger theoretical understanding of the principles behind each device. Although the applications of the TENG/MEG are interesting, I feel that coming out of this course, I do not have sufficient theoretical knowledge.

For lab section, I think that more content could be added to make it more interesting for students. The working principles of TENG and MEG design are certainly interesting. However, I would prefer if the instructor delved into more advanced methods and procedures than we learned during lab section. For several weeks, I felt that cutting out aluminum foil and plastic wrap with scissors was not very exciting. I would have liked to have learned how to use the laser cutting machine or more advanced equipment. For instance, the procedure for making the MEG was much more interesting to me because we were able to mix together Ecoflex and micromagnets, use an incubation chamber, and try the magnetic impulse generator.

- I really appreciate Dr. Chen as a professor! I understand that this was his first time teaching this course, and even then, I found it very enjoyable. His research / presentations were fascinating, and I really appreciated how accommodating he was with deadlines and extenuating circumstances. Thank you so much Dr. Chen!

- I really appreciated the opportunity to get hands on experience in MEGs and TENGs. One thing that I would change for the future is to incorporate the research papers into more of the course.
I really enjoyed this class! It was very interesting and I learned a lot.

I thought a lot of the lab activities were a little simple or repetitive, and I don't think this core bioengineering course should have been devices instead of cell culture (which 167L is traditionally). However, I learned some things which I thought were interesting and I thought Professor Chen was amazing.

Professor Chen is one of the kindest professors I have ever had who cares the most about student learning and well-being. His lectures are very clear and organized, although a decent amount of content overlaps between the first couple lectures. It would be more engaging if he spent less time reiterating why wearable biotechnology is needed, since the first lecture is all about that. I felt that the lab sections often did not require much learning or skill since we only made devices out of aluminum foil and cardboard. I would have learned a lot more and felt like I gained real experience if we started with the simple devices and then moved on to more advanced device fabrication like how a real TENG would be fabricated for a device. Overall it was a great course because Dr. Chen is so nice and accommodating, and I feel like I learned a lot from the lectures, just not as much hands-on experience.

Strengths: Excellently prepared lectures and insightful labs. Weaknesses: Some repeated material on slides.

The amount of material in this entire course could have been delivered in a single seminar. While wearable bioelectronics is an interesting subject, it is a very specialized part of bioengineering, which makes it irrelevant to a large portion of the class. Additionally, because Dr. Chen's lab was the first to create MEGs, the course is a bit biased towards the innovativeness of this device and glosses over some of its big weaknesses (like how they are carcinogenic, yet promoted as biocompatible and implantable). Dr. Chen is a great professor, but the subject matter for this course is too limited and specific to be stretched out over 10 weeks.

The class content was fascinating and the professor and TA team were really dedicated to making sure that we learned and were there to help whenever we needed. I will say that the content covered was very specific and it might not be applicable to every single student coming in but I thoroughly enjoyed it and loved the entire class.

The professor was very supportive of students and well-prepared for lectures. However, I felt that I did not learn much from the class overall because some of the lectures had redundant material, and the labs were quite repetitive and simplistic. Sometimes the labs did not feel like a good use of class time. Additionally, the professor did not offer much constructive criticism on our group presentations.

Professor Chen is a very good professor. He is very nice and I would take more of his classes. But the class itself was not great. There just wasn't enough material for ten weeks of classes. It felt like the lectures were primarily just the same slides repeated with very little new information. This material would have made a very interesting two hour seminar, but there just wasn't enough to talk about for ten weeks.

Strength: get to work with novel technologies and learn how to write papers. Lectures were great, interesting and engaging. Weakness: lab sections for TENG were rather repetitive and slow and could have been combined together to allow more time for MEG applications and also more time to work on final projects to make a more developed final product.
2. To What Extent Do You Feel That:

| 2.1) Instructor Concern – The instructor was concerned about student learning. | Very Low or Never | Very High or Always | n=21 | av.=8.90 |
| 2.2) Organization – Class presentations were well prepared and organized. | Very Low or Never | Very High or Always | n=21 | av.=8.76 |
| 2.3) Interaction – Students felt welcome in seeking help in or outside of the class. | Very Low or Never | Very High or Always | n=21 | av.=8.81 |
| 2.4) Communication Skills – The instructor had good communication skills. | Very Low or Never | Very High or Always | n=21 | av.=8.38 |
| 2.5) Value – You have learned something you consider valuable. | Very Low or Never | Very High or Always | n=21 | av.=7.71 |
| 2.6) Overall – Your overall rating of the instructor. | Very Low or Never | Very High or Always | n=21 | av.=8.62 |
| 2.7) Overall – Your overall rating of the course. | Very Low or Never | Very High or Always | n=21 | av.=7.67 |

3. Your View of Course Characteristics:

| 3.1) Subject interest before course | Low | High | n=21 | av.=2.10 |
| 3.2) Subject interest after course | Low | High | n=21 | av.=2.62 |
| 3.3) Mastery of course material | Low | High | n=21 | av.=2.86 |
| 3.4) Difficulty (relative to other courses) | Low | High | n=21 | av.=1.43 |
| 3.5) Workload/pace was | Too Slow | Too Much | n=21 | av.=1.81 |
| 3.6) Texts, required readings | Poor | Excellent | n=14 | av.=2.36 |
| 3.7) Homework assignments | Poor | Excellent | n=16 | av.=2.50 |
| 3.8) Graded materials, examinations | Poor | Excellent | n=21 | av.=2.57 |
| 3.9) Lecture presentations | Poor | Excellent | n=21 | av.=2.71 |
| 3.10) Class discussions | Poor | Excellent | n=19 | av.=2.63 |
4. ABET Course Outcomes (please note that these questions are required to be answered)

| 4.1) | (a) Learn how to work effectively and safely in a laboratory setting | Poor | | | Poor | | | Poor | Excellent | n=21 | av.=4.24 |
| 4.2) | (b) Gain a diverse skill set of skills useful for bioengineering practice | Poor | | | Poor | | | Excellent | n=21 | av.=4.05 |
| 4.3) | (c) Document experimental progress in a laboratory notebook, analyze and prepare scientific papers/reports | Poor | | | Excellent | n=21 | av.=3.71 |